REQUEST FOR PROPOSALS
FOR DESIGN-BUILD SERVICES CONTRACT
FOR PROJECT NO. 80002542 - CONTRACT NUMBER 9909
WTP – HOUSE SERVICE MAIN PROJECT
WATER SERVICES DEPARTMENT
CITY OF KANSAS CITY, MISSOURI

1. **Purpose.** This is a Request for Proposals ("RFP") issued by the City of Kansas City, Missouri ("City" or "Owner") acting through its Water Services Department (WSD) for Design-Build services including design, construction, and startup for the Water Treatment Plant - House Service Main Facility Project (Project).

The City will use Fixed-Price Design-Build (FPDB) contracting method to deliver the Project and is utilizing a two-step evaluation process for selecting the entity that will provide best value as the Design-Builder for the Project.

This RFP establishes the process for soliciting, and evaluating Statement of Qualifications (SOQs), and evaluating Technical and Cost Proposals (Proposal) from entities (Proposers or Design-Builders) qualified to perform the work per the SOQ evaluation. SOQs will be reviewed and evaluated in accordance with the provisions of this RFP. The City may disqualify any Design-Builder that fails to demonstrate a thorough familiarity of the scope of work and performance requirements in the technical and cost proposal.

The execution of a Contract will be subject to the terms and conditions of the RFP. This RFP is not a tender or an offer. Respondents must be thoroughly familiar with the scope of work and performance requirements discussed in this RFP. The City may reject any Proposal that fails to demonstrate such familiarity. In no event will the City be liable for any costs incurred by any Respondent or any other party in developing or submitting a Proposal, except as described in Section 3.10, below.

The Proposals must be submitted in accordance with the requirements set forth in this document.

2. **Definition of Request for Proposals.** This RFP is an invitation by the City to Design-Build Professionals soliciting Proposals from the public.

This Request for Proposal will not be shortlisted and respondents and does not include any stipends for design development.

City will select the best proposals based upon the judgment of the City in obtaining a Design-Builder Professional that will be in the best interests of the City. Respondent's submittal of a proposal in response to this RFP does not create any right in or expectation to a contract with the City.

3. **Submittal Date**. Sealed Proposals are due by March 5, 2025, at 2:00 pm local time. Proposals shall be sent to Delois Moore, Procurement Manager, General Services Department, Procurement Services, Division/KC Water, 4800 East 63rd Street, Kansas City, MO 64130. Delivered to the KC

Water Administration Building, 4800 E. 63rd St. **Mailroom** entrance eastside of the building. Deliveries made to the Security Desk will **not** be accepted. For the technical proposal and statement of qualifications, respondents should submit three (3) paper documents (one original and two [2] copies) as well as one (1) electronic version on a USB flash drive (in searchable PDF format).

For the Cost Proposal, **One (1)** paper document (one original), as well as one electronic version of the **Cost Proposal** on a USB flash drive (in searchable PDF format), must be submitted in a single, sealed envelope or package separate from the Respondent's Statement of Qualifications and Technical Proposals.

The Statement of Qualifications, Technical Proposals, and Cost Proposals must be submitted in separate, sealed envelope or box and shall not be opened until after the due date. Each Technical and Cost Proposal document package shall be plainly labeled with the words "STATEMENT OF QUALIFICATIONS FOR WTP – HOUSE SERVICE MAIN PROJECT – PROJECT NO. 80002542", "TECHNICAL PROPOSAL FOR WTP – HOUSE SERVICE MAIN PROJECT – PROJECT NO. 80002542" and "COST PROPOSAL FOR WTP – HOUSE SERVICE MAIN PROJECT – PROJECT NO. 80002542," respectively, along with Proposer name and identification. The City reserves the right at any time to change or extend the due date and time for any reason.

Each Respondent assumes full responsibility for the timely delivery of its Proposals at the required location. Proposals received after the Submittal Date may be deemed non-responsive and be excluded from consideration. A delivery acknowledgement will be issued upon receipt of the Proposal package and will be provided to the Respondent via e-mail by the City's Project Manager.

Only written responses will be considered. All materials submitted will become part of the response and may be incorporated into any subsequent contract(s) between the City and the selected Respondent.

4. **RFP Package.** The RFP package for this project contains the following:

Section 1: Project Overview
Section 2: Fixed-Price Design-Build Services
Section 3: Procurement Process
Section 4: Proposal Submission Requirements
Section 5: Final Proposal Evaluation and Selection
Section 6: Conditions for Respondents

Attachments:
- Attachment A: Definition of Terms
- Attachment B: Scope of Design-Build Services
- Attachment C: Draft Contract for Design-Build Services
- Attachment D: Project Background Documents
- Attachment E: Technical Requirements
- Attachment F: Technical Proposal Forms

Attachment G: Bid Forms
Attachment H: Submission Forms including Civil Rights and Equal Opportunity Department (CREO) Documents (To be submitted within 48 hours of Public Bid Opening, in accordance with Section 5.5.1)

5. **Questions.** Forward all questions by email to both the following Project Manager and Procurement Manager. Questions received after the Deadline for Receipt of Written Questions (Section 3.2 Procurement Schedule) may not be answered. Interpretations or clarifications considered necessary by the Project Manager in response to such questions will be issued by Addenda to all Respondents. Oral or other interpretations or clarifications shall be without legal effect, even if made during formal meetings.

Saurabh Kelkar, Project Manager
4800 East 63rd Street,
Kansas City, MO 64130
Phone: (816) 513-0223
E-mail: saurabh.kelkar@kcmo.org

Delois Moore, Procurement Manager
Procurement Services, Water Services Department
4800 E 63rd Street
Kansas City, MO 64130
Phone: (816) 513-0358 Phone
Email: delois.moore@kcmo.org

For persons with disabilities needing reasonable accommodations please contact the City's ADA Specialist at 816-513-6589.

SECTION 1: PROJECT OVERVIEW

1.1 Project Background

The Briarcliff WTP was built in the 1920s. It sources all water from the MO river or nearby wells, treats it, and delivers finished water/drinking water to the ratepayers of the City of Kansas City, MO. Finished water is delivered to the ratepayers, and also services the plant industrial process equipment, the hydrants, the water closets/bathrooms, and the drinking fountains.

Certain project background documents are being made available to the Respondents, as referenced in Attachments C (Project Background Documents), D (Project BIM Files), E (Technical Specifications) and F (Project Design Criteria), for the purpose of preparing Proposals. The City is providing these documents only for the purpose of obtaining Proposals for the Project and does not confer a license or grant permission for any other use. Documents referenced in Attachment C (Project Background Documents), Attachment D (Project BIM Files) and Attachment E (Technical Specifications) will only be made available in electronic format.

Due to severity of consequences of pipe failure, the complexity of water hammer analysis, construction sequencing, and the desire to allocate risk to one entity, the City decided there is benefit in utilizing a Design-Build method for the Project and a Fixed-Price Design-Build (FPDB) method was selected. The FPDB method outlined in this RFP was chosen to allow WSD staff involvement in the design process for the Project while leveraging the schedule, collaboration, and other advantages that result from use of a design-build process.

Ongoing coordination services and meetings with WSD will be required.

Because the City has specific technical requirements, preferences, and standards regarding some elements of the facilities design, as well as the desire to control how and where risk will be assigned as part of this Project, preliminary project design parameters are provided in Attachment E (Technical Specifications) and further described in Section 1.2.1. Project Technical Requirements.

1.2 Project Scope

This RFP is to provide Design-Builder Services for design, construction, and commissioning the following scope of work as defined in the Technical Specifications (Attachment E), within the City's Budget. Design-Builders shall indicate which of the project elements below are in the bid and the bid shall not exceed the project budget. Scopes Rank Ordered as follows:

City strives to keep following project scope under the project budget of $2,000,000.

1) House Service Main Replacement (12in., 8in. & 6in. NPS)
2) Hydrant Replacement
3) Removal of O.O.S. Piping
4) Pipe Rack Replacement
5) Condition Assessment and Replacement of Flush Lines to Sludge Houses
6) Condition Assessment and Replacement of Sludge discharge lines from Sludge Houses.

7) Concrete Repair

For full scope of services, refer to Section 01110 – Summary of Work

Under the FPDB method, the Design-Builder's scope of work for the Project will be performed in two (2) phases under a single Contract for Design-Build Services between the City and Design-Builder. These phases (described in Attachment B (Scope of Design-Build Services) may run concurrently and are generally described as follows:

- **Design Phase** services performed under the Contract for Design-Build Services include completing the entirety of the Project's final design and pre-construction activities.

- **Construction Phase** services performed under the Contract for Design-Build Services include: Performing construction; performing post-construction tasks, such as commissioning and initial performance testing; providing a "Smart BIM", as specified by the City; and performing warranty and other work required.

1.2.1 Project Technical Requirements

The Project Technical Requirements, as provided in the Attachments, are considered Contract Documents and define the basis of project design and definition as developed to-date for this RFP. Technical Proposals must incorporate all Project Technical Requirements. includes the native files for the Respondents to use in developing Proposals. Project Technical Requirements are included within Attachment D: Project Background Documents.

The Project Technical Requirements describe the "Representative Project." Respondents may deviate from the Representative Project ("Respondent's Proposed Modified Project"), if justified and approved by the City. **All Technical Proposals and Cost Proposals must be based on either the Representative Project or the approved Proposed Modified Project.** The Project Technical Requirements (Attachment E) are available on a USB flash drive or eBuilder for Shortlisted Respondents.

The Project Design Criteria identify both **Fixed Design Criteria**, **Indicative Design Criteria, and Preferred Indicative Design Criteria** for the Representative Project. Fixed Design Criteria must be adhered to and followed by the Respondent. However, the City would like to promote innovation and encourage best value; therefore, the City will consider technical alternatives that are better than or equal to the Indicative Design Criteria. Proposed variances from Indicative Design Criteria must be included within and submitted as part of the Technical Submittal (see Section 4). Recommended variances will be discussed between the City and the Respondent, and the City will determine if the variation is "approved" or "not approved." Respondent recommendations (both "approved" and "not approved" variances) for Indicative Design Criteria and Preferred Indicative Design Criteria will be considered proprietary and will be kept confidential. The Respondent must also document the recommended technical alternatives to the Indicative Design Criteria in its Technical Proposal.

1.3 City's Objectives

The City's objectives for delivery of the Project are as follows:

- **Quality:** Provide assets that will be resilient, sustainable, and will reliably provide service in full compliance with federal and state regulations and contractual standards for the full range of performance criteria set forth in this RFP.

- **Cost:** Minimize capital cost with consideration of optimizing life-cycle cost.

- **Schedule:** Achieve the scheduled completion dates for design, construction and performance testing of the Project.

- **Risk:** Achieve an optimal balance of risk allocation between the City and the Design-Builder. In general, the party best suited to manage the risk owns the risk

- **Safety:** Implement an effective safety program incorporating best industry practices.

- **Operations and Maintenance (O&M):** Optimize operating and maintenance requirements so that the facility is capable of reliably and continuously operating in a cost-effective manner over the long term. Develop and deliver, in conjunction with City and WSD management, a program that provides effective classroom and hands on training for WSD staff to transition to full-time operation and maintenance of new facilities, electronic O&M manuals, and Standard Operating Procedures.

- **Accountability:** Provide for Design-Builder assumption of single point of accountability for performance of all services under the Contract for Design-Builder Services.

- **Smooth Transition:** Smooth transition of design deliverables (i.e. as-builts, building information models [BIM]), electronic O&M Manuals, etc. from the Design-Builder to the City for use in the City's O&M systems, such as maintenance management and asset management. Smooth transition of facility operations following commissioning activities between the Design-Builder and the City.

- **Collaboration:** Provide for coordinated design development with City input in a manner that preserves Design-Builder's sole responsibility for the achievement of Project performance objectives while meeting City objectives associated with cost, quality, aesthetics, and long-term operability.

- **Sustainability:** Per Section 1.6, all solutions identified to improve the quality of life of facility personnel, reduce labor usage, reduce material usage, and reduce waste created after construction is completed.

By selecting the FPDB delivery method for the Project, the City is committed to working in close collaboration with the Design-Builder.

1.4 Project Funding

The project budget is currently estimated at **$2.0 million; this budget price shall be utilized in Design-Builder's proposal**. This budget does not include the City's other Project costs, such as professional advisory services, site investigations, environmental studies, certain governmental approvals, taxes, and other related costs.

The Project may be financed through a combination of City municipal revenue bonds and cash.

1.5 Project Schedule

The Project schedule is anticipated as follows:

- Design-Builder Notice-to-Proceed July 2025
- Facility Commissioning December 2026
- Substantial Completion January 2027
- Final Completion March 2027

1.6 Sustainability

The City has adopted an overall policy supporting a greater use of "green solutions" or enhanced sustainability measures that consider environmental quality, social equity and economic vitality. In order to minimize waste, enhance efficiencies, and achieve multiple benefits and project synergies, all City projects must identify opportunities for sustainability improvements and implement those improvements when financially reasonable and operationally practical.

The Envision™ rating system is used by WSD to promote sustainability in a variety of infrastructure projects and to encourage sustainable approaches as an important part of project design. Envision™ will also be used to evaluate and grade the sustainability of Project components as they are developed.

City also desires for all City of Kansas City, MO services to be carbon neutral by the year, 2030.

SECTION 2: FIXED-PRICE DESIGN-BUILD SERVICES

2.1 General

The services to be undertaken by the Design-Builder include all Work defined in the Contract, including all Design Professional Services, Construction Services, and other obligations to be performed by Design/Builder under the Contract Documents, including without limitation project management, supervision, training, testing, permitting, commissioning, and all other services and deliverables required by Contractor to achieve Final Acceptance of the Project in accordance with the Contract Documents.

Design-Builder services are as noted in Section 1 and more fully described in Attachment B (Scope of Design-Builder Services).

2.2 Roles and Responsibilities

City: The City will cooperate with the Design-Builder and will fulfill its responsibilities in a timely manner to facilitate the Design-Builder's timely and efficient performance of services. The City's responsibilities include:

- Review submissions and provide comments to Design-Builder in a timely manner.
- Furnish existing studies and provide complete, accurate, and reliable data and information regarding the Project, including record drawings, preliminary studies, environmental impact assessments, Preliminary Design BIM models, Site plans, etc.
- Provide information and provide (or engage Design-Builder to perform) additional studies that may be necessary to complete the Project.
- Provide adequate funding.
- Provide access to the Project site and any necessary easements.
- Obtain the governmental approvals and permits the City is responsible for and assist Design-Builder in obtaining governmental approvals and permits Design-Builder is responsible for.
- Provide necessary data and inputs, characteristics and ranges (e.g., flows and pressures) for Project start-up and performance testing.

Design-Builder: The Design-Builder will cooperate with the City and will provide in a timely manner the services, as described in Section 2.1, necessary to complete the general Project scope specified in Attachment A (Scope of Design-Build Services).

The roles and responsibilities of the City and the Design-Builder are more fully described Attachments A (Scope of Design-Build Services) and B (Contractual Requirements) in the RFP.

SECTION 3: PROCUREMENT PROCESS

3.1 Communications and City Contact

On behalf of the City, **Delois Moore, Water Services Department** will act as the Procurement Manager and as the sole point of contact (City Contact) and administrator for the RFP process. All communications shall be submitted in writing by email, sent to the procurement manager and project manager, and shall specifically reference this RFP. All communications and questions regarding the Project shall only be made through the City Contact with the exception of City-certified Disadvantaged Business Enterprises, Minority Business Enterprises, and Women Business Enterprises (D/M/WBE) and of Respondents contacting the Civil Rights and Equal Opportunity Department to assist in meeting MBE/WBE goals. D/M/WBEs may contact WSD, General Services, and CREO staff directly regarding the Project.

No oral communication from the City Contact or any other individual is binding. Oral or written contact with other City staff, WSD staff, the Owner's Advisor, or any public official specific to the Project during the RFP/Design-Builder Selection process is prohibited. A violation of this provision may result in disqualification of the Respondent from the RFP/Design-Builder Selection process.

3.2 Procurement Schedule

The procurement process includes several confidential meetings which are discussed in further detail in Section 3.4 Confidential Meetings. The approximate procurement schedule is as follows:

- Issuance of RFP — January 8, 2025
- **Mandatory Pre-proposal Meeting — January 22, 2025 @ 9:30 AM**

Microsoft Teams Need help?
Join the meeting now
Meeting ID: 250 235 262 683
Passcode: Ly22Xo32

For organizers: Meeting options

- Site visit — February 5 – 6, 2025
- Deadline for Receipt of Written Questions — February 19, 2025
- Issuance of Final Addendum — February 26, 2025
- Proposal (SOQ, Technical, and Cost) Submission — March 5, 2025
- Public Bid Opening Date — March 26, 2025

- Notice of Intent to Contract April 21, 2025

3.3 Withdrawal from Proposing

A Respondent may withdraw from submitting a Proposal by providing a written request, duly executed by an authorized representative, and delivered to the City Contact at any time prior to the Proposal Submittal Due Date. Individuals making the withdrawal will be required to provide evidence of authorization to represent the Respondent. After the Proposal Submittal Due Date, Proposals shall not be withdrawn or modified except to the extent agreed to by the City.

3.4 Validity of Proposal

The offer represented by each Proposal will remain in full force and effect after the Proposal Submittal Due Date and cannot be withdrawn for a period of 120 days unless:

- The City has cancelled the RFP;
- The City has awarded the Contract to another Respondent and Contract execution has occurred; or
- The City, in its sole discretion, allows a Respondent to withdraw its Proposal prior to such deadline.

The City and the Respondent may mutually agree, in writing, to extend the validity of a Proposal beyond the validity period..

3.5 Addenda

This RFP is subject to revision after the date of issuance via written addenda until the Issuance of Final Addendum date in Section 3.2 Procurement Schedule. The City may extend the Submittal Due Date (and any dates in the Procurement Schedule) via addendum at any time. A copy of all such written addenda will be posted at the Kansas City, Missouri Plan Room, http://www.kcmoplanroom.org. All addenda will be posted at this location. Any document or plan may be viewed or downloaded from this location.

The following documents will be made available for download: (1) the RFP (including all Attachments) and (2) addenda to the RFP. It is each Respondent's responsibility to obtain all RFP addenda prior to submitting its Proposal.

If the Respondent has any doubt as to the true meaning of any part of this RFP, or if any discrepancies in or omissions from this RFP are discovered by Respondent, a written request for an interpretation or correction may be submitted to the City Contact (see Section 3.1) for response. The Respondent submitting the request will be responsible for delivery no later than the Deadline for Receipt of Written Questions. The City will not be responsible for any other explanation or interpretations of the documents.

It is the responsibility of all Respondents to ascertain whether any addenda have been issued before the Submittal Due Date by checking the Kansas City, Missouri Plan Room. If an Addendum is issued, Respondent must acknowledge receipt of Addendum on the DB 00410 Design-Build Bid Form submitted with the Cost Proposal (see Section 4.3.11 Cost Proposal).

3.6 Inclusion of Proposal in the Contract

Portions of the successful Respondent's Proposal will be used to complete various Contract provisions and Exhibits and will therefore become part of the Contract. All other information is for evaluation purposes only and will not become part of the Contract.

3.7 Site Access Period

The City will provide Respondents scheduled access, during periods shown in Section 3.2, to Project site located at the Briarcliff WTP by appointment. Each Respondent shall contact the City Contact to schedule a date and time to tour the Facilities. The City will provide up to two (2) hours of site access for each Respondent. City staff will accompany the Respondent in touring the Facilities, however, staff will not be allowed to answer procurement or Proposal-related questions. Site access will be granted approximately one (1) week after the Request for Proposal is provided.

Respondents visiting the Project site shall be responsible for their own safety including equipment and safety procedures. No information conveyed by the City to Respondent resulting from these site tours shall act to modify the RFP unless such modifications are made by Addendum.

SECTION 4: PROPOSAL SUBMISSION REQUIREMENTS

4.1 Submittal Due Date

Refer to Paragraph 3 above for submittal location and due date.

4.2 Submission Format

The Statement of Qualifications (SOQ) must not exceed t**en (10)** total narrative pages. The Technical Proposal must not exceed **twenty (20)** total narrative pages.

The narrative pages (most or all 8½ x 11 inch with 1-inch or greater margins) shall be in 11-point font. Each page will count as one page if printed only on one side, and two pages if printed on front and back. Eleven (11) point font or larger must be used in Parts 1 and 2 of the Technical Proposal. Page count excludes the transmittal letter, index or table of contents, front and back covers, title pages/separation tabs, and appendices. A maximum of **five (5)** of the total pages may be 11 x 17 inch z-fold format. The SOQ and proposals shall be typed or printed double-sided to the extent possible and shall have continuously numbered pages. Each part of the SOQ and Technical Proposal, and Appendices shall be labeled with title headers.

The Technical Proposal submission envelope or box shall include Design-Builder's name and address and shall be labeled "STATEMENT OF QUALIFICATIONS & TECHNICAL PROPOSAL FOR WTP – HOUSE SERVICE MAIN PROJECT – PROJECT NO. 80002452".

The Cost Proposal submission envelope or box shall include the completed Cost Proposal submission forms in Attachment G (Cost Proposal Forms) and any supporting documentation requested in this RFP.

The Cost Proposal envelope shall include Design-Builder's name and address and shall be labeled "COST PROPOSAL FOR WTP – HOUSE SERVICE MAIN PROJECT – PROJECT NO. 80002452".

Drawings shall be half-size versions (11" x 17") of ANSI 22" x 34" sheets. The set shall include a cover sheet and index of all drawings included in the set. Drawings are excluded from the page limit of the Technical Proposal.

4.3. Submission Content

4.3.1 General Outline

4.3.1.1. Transmittal letter (Does not count toward page count)

4.3.1.2. Statement of Qualifications (SOQs)

(a) SOQ Part 1 – Design-Builder Profile

(b) SOQ Part 2 – Key Personnel

4.3.1.3. Technical Proposal

(a) TP Part 1 – Project Plans – Management Approach

(b) TP Part 2 – Technical Approach

(c) TP Part 3 – Construction Scheduling, Planning, and Sequencing
(d) TP Part 4 – MBE/WBE Utilization

4.3.1.4. Cost Proposal

(a) DB 00410 Design-Build Bid Form/Affidavit of Intended Utilization
(b) 00430 Bid Bond

4.3.1.5. Appendices (Does not count toward page count)

(a) Appendix A – Forms for Affirmation and Compliance
(b) Appendix B – Resumés
(c) Appendix C – Safety & Quality Documentation
(d) Appendix D – Design Drawings
(e) Appendix E – Past Experience
(f) Appendix F – Project Schedule

4.3.2 Transmittal Letter

Design-Builder will submit a transmittal letter on the Design-Builder's letterhead. The letter must be signed by the Design-Builder Principal, the authorized representative of the Design-Builder listed on Form 00515.01, who is empowered to sign such material and to commit the Design-Builder to the obligations identified herein. If Design-Builder is a corporation or a limited liability company (LLC), an authorized officer shall sign his/her name and indicate his/her title beneath the full corporate name. If Design-Builder is a joint venture, an authorized representative for each member of the joint venture shall sign the letter, and specifically state that, if the joint venture is selected as the Design-Builder, each member will be jointly and severally liable to the City for the obligations arising out of the contracts between the joint venture and the City.

The Transmittal Letter may include any information deemed relevant to the Respondent, but must include the following:

1. The name of the proposed Design-Builder, Lead Contractor and Lead Designer.

2. The name of Design-Builder's authorized representative(s), address(es), phone number(s), and e-mail address(es).

3. An identification of the Design-Builder's Point of Contact, including name, address, phone number, and email address, and must specify who would be the Design-Builder's signatory to any contract documents executed with the City.

4. An Executive Summary of the Proposal, with no references whatsoever to the Cost Proposal.

5. A declaration of the Design-Builder's intent, if selected, to enter into a contract with the City for the Project in accordance with the terms of this RFP;

6. An affirmation that all professional and business registrations and licenses required for the Project have been obtained or will be obtained prior to award of the Contract for Design-Build Services. This includes, but is not limited to the registrations/licenses for the members of the Respondent's team that are professional engineers and will be the Engineer-of-Record for the Project;

7. A statement of the Design-Builder's intent to provide Performance and Payment Bonds and all insurance required under the Contract for Design-Build Services, respectively by the date of award of the Contract.

8. An affirmation that the representations made in the Proposal will remain in force and effect for one hundred and eighty (180) days from the Proposal Submission Due Date.

9. An affirmation that the Design-Builder has completed and included in either Appendix A – Forms for Affirmation of Compliance, Appendix E – Equipment Forms, or in Part 5 – Cost Proposal all required submission forms provided in Attachment F – Project Design Criteria, Attachment G – Bid Forms, including Acknowledgement of the receipt of any addenda (DB 00410) and Attachment H (Submission Forms including CREO Documents).

The Transmittal Letter shall be limited to three (3), 8 ½ x 11-inch pages. **Submittals (SOQ and Technical Proposal) that do not include a transmittal letter will be considered non-responsive and the Design-Builder will not be selected.**

4.3.3 Statement of Qualifications

The **Statement of Qualifications (SOQs)** include the following in the order listed.

- Part 1 - Design-Builder Profile
- Part 2 - Key Personnel
- Appendix B - Resumés (not included in page count)

4.3.3.1. SOQ Part 1 – Design-Builder Profile

At a minimum, the following information must be submitted, otherwise the SOQ will be deemed non-responsive and the Design-Builder will not be selected:

- **Executive Summary.** The executive summary (maximum three pages) must include a concise overview of the key elements of the SOQ and must summarize and refer to information in the SOQ concerning satisfaction of the Mandatory Requirements. The executive summary shall not be used to convey additional information not found elsewhere in the SOQ.

- **General.** Provide general information about the Design-Builder, Lead Designer and Lead Contractor organization(s), such as lines of business and service offerings, locations of

home and other offices, number of employees (professional and non-professional), years in business, and evidence of required licenses.

Identify which members of the Project Team will function as the Lead Contractor and Lead Designer, as defined in Attachment A – Scope of Design-Build Services. Identify Key subcontractors such as systems integrators and Kansas City certified MBE and WBE firms. Identify the scopes of work of each MBE/WBE firm and available bonding capacity of MBE/WBE firms for this project if practical. Provide copies of the construction licenses for Lead Contractor and copies of engineering license of the Design Manager and the individual that will act as the engineer of record in Appendix A (Forms for Affirmation and Compliance). The Design-Builder and Lead Contractor must each possess and maintain current, valid, and appropriate State of Missouri construction licenses for performance of the construction work. The Design Manager and the individual that will act as the engineer of record must possess and maintain a current, valid and appropriate State of Missouri engineering license for performance of design services. If Design-Builder, Lead Contractor, Design Manager, or individual that will act as engineer of record does not currently maintain a State of Missouri license, please provide a letter of commitment to retain such required license by the time of the Issuance of the RFP.

The Design-Builder's and Lead Contractor's construction licenses may not have been suspended or revoked in the last five (5) years; and the engineering licenses for the Design Manager and the individual that will act as the engineer of record may not have been suspended or revoked in the last seven (7) years.

- **Legal Structure.** Identify whether the Design-Builder is organized as a corporation, LLC, or joint venture and which entity will obtain the performance and payment bonds that will be used; and provide a copy of joint venture agreement that was filed with the State of Missouri in Appendix A (Forms for Affirmation and Compliance). **If Design-Builder is a joint venture, all information required of a single entity must be submitted by each member of the joint venture.**

- **Bonding Capacity.** A potential "step-up and step-down" bonding approach may be used for the Project. Such an approach could allow different bonding limits between Project phases (e.g. Design and Construction). In Appendix A – Forms and Affirmation of Compliance, Design-Builder shall provide a notarized letter(s) from its surety (or sureties) verifying the Design-Builder has a minimum bonding capacity of $1.7 million available for this Project for performance and payment bonds. The Design-Builder's surety (or sureties) must have a rating of A- or better in the latest revision of the A.M. Best Company's Insurance Report, must be authorized by law to do business in the State of Missouri, and must be listed in the U.S. Department of Treasury Circular 570. The Design-Builder should note that the City intends for the Design-Builder's performance bond to remain in place through Final Completion.

- **Quality Services Assurance Act.** Comply with the City's Quality Services Assurance Act, Section 3-66, Code of Ordinances.

- **Sustainability.** Include a concise (maximum of two pages) summary of your company's policies, strategies, and actions that demonstrate your philosophy and commitment to sustainability in accordance with Section 1.6.

- **Insurance.** The selected Design-Builder will be required to maintain for the duration of the Contract for Design-Build Services and provide certifications of insurance coverage(s). In Appendix A – Forms and Affirmations of Compliance, Design-Builders are required to provide a notarized declaration from their insurance carrier(s) that their firm is able to obtain insurance coverage in the following limits:

o General Liability	$2,000,000(Aggregate) $1,000,000 (per occurrence)
o Builder's Risk or Property Insurance (Full Replacement Cost)	$2,000,000
o Professional Liability	$1,000,000
o Cyber Security	$2,000,000

  The Lead Designer may provide the professional liability insurance if Lead Designer will be a subcontractor to the Design-Builder. The required insurance must be obtained and maintained from insurance companies that have an A.M. Best Rating of no less than A:VII, unless otherwise acceptable to the City, and are duly licensed or authorized. The City shall be named as an additional insured as appropriate and shall be entitled to the fullest coverage permitted by law.

  The SOQ must provide the following additional information pertaining to factors or events that have the potential to adversely impact the Design-Builder's ability to perform its contractual commitments.

- **Termination for Default, Criminal Convictions, and Debarment**. Design-Builder shall submit the following information with respect to the Design-Builder, Lead Contractor and Lead Designer:

  - Identification of any contract that has been terminated for default within the last five (5) years.

  - Identification of any criminal conviction, and any violation of any federal, state, or local statute or regulation, or of any court order addressing or governing antitrust, public contracting, employment discrimination, false claims, or prevailing wages within the last five (5) years.

- Identification of any debarment, or any consideration for debarment, on public contracts by the federal, state, or local government, or by any agency of such government within the last five (5) years.

Present the Design-Builder's position on the matter. The City will evaluate the facts and may, at its sole discretion, reject the Design-Builder's SOQ if the facts discovered indicate that completion of a contract resulting from the RFP may be jeopardized by selection of such Design-Builder.

If any of the above questions is answered in a manner that indicates that any of these unfavorable factors or events are present, it is the Design-Builder's responsibility to: (1) describe in detail the unfavorable factor or event; and (2) provide sufficient information to demonstrate that the unfavorable factor or event will not adversely impact the Design-Builder's ability to perform its contractual commitments. **Include these responses, as well as the completed DB 00210.01 Design-Build Background Information Form provided in Attachment B – Contractual Requirements, Forms to be Submitted in Appendix A – Forms and Affirmation of Compliance.**

The Design-Builder must notify the City of any changes subsequent to submission of the SOQ and before the selection process is completed related to the Design-Builder Profile (and, in the case of the selected Design-Builder, before execution of the Contract for Design-Build Services).

4.3.3.2. SOQ Part 2 - Key Personnel

Identify the proposed Key Personnel (and their firm affiliations), as defined in Attachment A – Definition of Terms. Provide the names, e-mails addresses, intended utilization rate on this project, primary office location, percent of working time in the Kansas City Metropolitan Area during this project, and phone numbers of all such Key Personnel. The City expects Key Personnel named in this SOQ to remain on the Project Team for the duration of the Project and may not be removed or substituted without the City's prior written consent. The City also expects the Key Personnel to be utilized at the rate indicated at the specified locations. Design-Builder shall provide information regarding at most 5-8 project team personnel other than those team members defined as Key Personnel in Attachment A – Definitions of Terms.

Provide resumes for all Key Personnel in Appendix B - Resumés. Resumés must be limited to two (2), single-sided 8½ x 11-inch pages per Key Personnel and half a page for other team members. Provide the following background information for each Key Personnel:

- Total years of experience in the design and/or construction of water/wastewater public works projects.
- Years of employment with current employer.
- City of residence.

- Percent of working time anticipated to be in the Kansas City Metropolitan area during this project.

- Intended utilization during this project. DB may break utilization down by phases.

- Academic and professional qualifications.

- Professional registration(s) (as applicable) and certifications such as Design-Build Institute of America's "Designated Design-Build Professional" that are applicable to the Project.

- Experience as it relates to the Project (including reference projects and the individual's role in referenced project) and to the individual's specified role on the Project.

    - Provide staff capacity for meeting CITY's requirements.
    - Identify Key Personnel who are likely to be assigned to this Contract if proposal is selected. Key Personnel must be committed to contract duration and may not be removed or substituted without CITY's prior written consent.
    - For each Key Personnel member, provide a resume and/or summary with at least the following background information:
        - Description of relevant experience.
        - Years of employment with business/firm
        - Years of employment in Industry
        - City and State of Residence
        - State time commitment on other accounts
        - Applicable professional registrations, education, certifications, and credentials.
        - Experience relevant to position on this project team.
    - Comment on recovery plan in the event your business/firm sustains loss of Key Employee.
    - Provide staffing plan for the Contract including locations of the positions.
    - Provide an organizational chart for assigned staff. Provide certifications that indicates all employees working on this Contract in city limits of Kansas City, Missouri are paid a minimum of $12.50 per hour in compliance with City's Quality Services Assurance act, Section 3-66, Code of Ordinances.
    - If certification can not be provided, submit the following items for CITY to evaluate potential quality of personnel.
        - Turnover rate for the last three (3) calendar years for non-exempt employees and exempt employees
        - Employee benefits provided to exempt and non-exempt employees.
        - Training provided to exempt and non-exempt employees including those providing services to CITY
        - Promotional opportunities for non-exempt and exempt

        - Average tenure of exempt and non-exempt employees during the immediately preceding three (3) calendar years
        - Employee incentive rewards and employee recognition policies
        - How your firm provides and receives employee feedback and communication
        - Mentorship programs provided to employees
        - Education benefits provided for exempt and nonexempt employees.
    - Design-Build experience of team members may be considered a larger significance by CITY.

      The following roles must be identified, demonstrated as they pertain to the project including construction manager, design project manager, construction superintendent, safety, quality, sustainability, and engineers responsible for civil, structural, process, and mechanical.
- Experience working at the Water Treatment Plant and/or with the City of Kansas City, Missouri, as well as within the greater Kansas City area.

- Identify any other projects Key Personnel will be involved with concurrently with the Project, and indicate the estimated time commitment for the Project and other projects listed if greater than 10%.

Provide three (3) project references for each of the Design-Builder's Key Personnel.

4.3.4 Technical Proposal

The **Technical Proposal** must include the following in the order listed:

- Transmittal Letter
- Part 1 – Project Plans/Management Approach
    - Project Team/SOQ Confirmation
    - Design-Build Coordination and Management
    - Permitting
    - Self-Performance and Subcontracting
- Part 2 – Technical Proposal
    - Project Understanding
    - Technical Narratives
        - Including variances from Indicative Design Criteria
    - Technical Drawings (reference Appendix B)
    - Equipment Information (reference Appendix E)
- Part 3 – Construction Schedule, Planning and Sequencing (reference Appendix F)
- Part 4 – MBE/WBE Utilization
- Appendix A – Forms for Affirmation and Compliance (not included in page count)
- Appendix C – Safety & Quality Documentation (not included in page count)
- Appendix D – Design Drawings (not included in page count)
- Appendix E – Past Experience (not included in page count)

- Appendix F – Project Schedule (not included in page count)

The content requirements set forth in this RFP represent the minimum content requirements for the Technical Proposal. It is the Design-Builder's responsibility to present all relevant information and other materials in its Technical Proposal. The Technical Proposal, however, should not contain standard marketing or other general materials. It is the Design-Builder's responsibility to modify such materials so that only directly relevant information is included in the Technical Proposal.

Per Section 2-1585, City Code of Ordinances, the Technical Proposal may not contain any reference to the cost of the Project.

4.3.4.1. TP Part 1 – Project Plans – Management Approach

The Design-Builder shall use Part 1 of the Technical Proposal to demonstrate their approach for managing the Project from Design Phase through Commissioning Phase. It is not expected that the Respondent will include specific and developed plans, but should concisely demonstrate how the project will be executed with regards to project management, controls, quality, safety, permitting, and self-performing/subcontracting. The approaches should discuss who will manage the plan, how it will be assured/ensured, and provide a summary of the plan including discussion on how they comply with the City's practices.

Design-Build Coordination and Management Plan. The Design-Builder shall demonstrate that: (a) its coordination and management approach during design and construction includes specific measures to control budget, documentation, and schedule; and (b) it will implement policies and procedures to facilitate communication and input from members of the Project Team and City. At a minimum, Design-Builder shall:

- Describe the roles and responsibilities of the Project Team members, and how the Project Team is going to function to benefit the Project. Include an organization chart of the Project Team to illustrate its functionality, team reporting structure, etc.

- Describe the Design-Builder's concepts for managing the design, construction, and commissioning phases of the Project and how the Design-Builder intends to control budget, documentation, and schedule.

- Describe how the Design-Builder intends to control and coordinate the flow of information between design and construction teams, and how the Design-Builder plans to interface with the City and permitting agencies.

- Describe the communications methods for facilitating City review during all phases of the Project, including but not be limited to meetings, progress reports, submission of BIM updates, and document management tools.

- Describe Design-Builder's design process, including procedures for equipment selection, constructability reviews by the Lead Contractor, obtaining City input and Lead Designer's

involvement in oversight of construction. Describe where the design team will be geographically located and how operations team members will be involved in design and construction. Describe how Design-Builder will leverage Project Team's experience and expertise, including Lead Operations Coordinator, that is specifically applicable to this Project.

- Describe the Design-Builder approach to involving City staff in the operations and maintenance of the facilities during the Construction, the training of City staff, and other activities to efficiently transfer operations and maintenance responsibilities to the City following the completion of the Construction Phase. Describe Design-Builder's approach for development of standard operating procedures (SOPs), maintenance verification systems, and how the Respondent will work with the City's existing computerized maintenance management system.

Permitting. Design-Builder shall describe its specific approach to the permitting and regulatory requirements anticipated for the Project. In conjunction with the Project Technical Requirements and assignments of permit responsibilities, Design-Builder shall identify any additional anticipated permits, special considerations for obtaining permits and compliance, approach to coordinating with regulatory agencies and City, and proposed strategies to obtaining permits to minimize the influence on project schedule.

Self-Performance and Subcontracting. The selected Design-Builder shall perform with its own organization not less than fifty-percent (50%) of the total contract price. The dollar value included in this percentage performed by the Design-Builder shall include the value of labor, materials and equipment directly performed or procured by the Design-Builder and shall not include the value of work performed or provided by subcontractors.

Design-Builder shall provide a description of the general delivery approach of the Project, including use of subcontractors and proposed approach for self-performance. Identify proposed components Design-Builder would self-perform and the Design-Builder's approach to managing this work and subcontracted work.

4.3.4.2. TP Part 2 – Technical Approach

Part 2 of the Technical Proposal will be used by the City to understand and evaluate the Proposer's: (a) approach to meeting/exceeding the RFP Technical Requirements; (b) incorporation of innovative ideas and cost savings measures; and (c) incorporation of quality materials/equipment that will provide the City with cost effective operations and maintenance.

Project Understanding. Design-Builder shall discuss generally the tasks involved in the Project to demonstrate its knowledge of the overall Project and Project requirements and needs. Identify and describe how the Respondent would define and approach key Project challenges. Describe how the Design-Builder would be structured to best manage its activities and satisfy the needs of the Project, including the Lead Contractor's involvement/role during design, the Lead Designer's involvement/role during construction, and the Lead Operations Coordinator's

involvement/role during design, construction, and extended commissioning phases. Include the following discussions regarding the Design-Builder's project understanding:

- Define 5 key issues and challenges in both the design and construction of the Project. Describe how to mitigate potential negative impacts (i.e., risk mitigation strategy) of each key issue and any unique approaches or strengths the Respondent may have relative to the issues and challenges. Describe Design-Builder's contingency plans for various performance issues that might be encountered on the Project.

- Discuss how the approach will improve personnel access, address water hammer, and relieve pipe stress attributable to site conditions.

- Discuss any innovative ideas and approaches to completing the design and construction of the Project. Demonstrate the Design-Builder's ingenuity through design concepts, construction materials, and construction methods to achieve the most efficient and long-lasting treatment facility.

- Discuss any prominent concerns with the Design-Builder's capacity to meet the Project's schedule and budget and how the Respondent will manage budget and schedule requirements. The Design-Builder may provide situations and examples where its approach to managing the schedule and budget has been successful, but may not include any specific cost information in the Technical Proposal.

- Describe how the Design-Builder will approach start-up and commissioning including the key tasks the Design-Builder would recommend for achieving compliance with the Project requirements. Identify concerns and challenges with commissioning and how Design-Builder's team will address the risks. Design-Builder shall present an approach to start-up and commissioning with the key tasks the Design-Builder would recommend. Identify future start-up and commissioning plans that will be developed and approved by the City and indicate when they will be developed and submitted.

Technical Approach Narratives. Proposer shall provide a Technical Approach Narrative that clearly describes its specific technical approach to the Project with respect to the Project Areas and major Project elements as listed below. The intent of the technical approach narratives is to identify areas of compliance with the Fixed Design Criteria, as defined in the Project Technical Requirements, identify the Respondent's approach for the Indicative Design Criteria, and to provide justification for the approved design criteria variances as proposed in the Interim Deliverable submittal.

The organization of the Technical Approach Narrative shall follow the organization and content of the Project Design Criteria:

Performance Requirements
Project Site and Existing Facilities
Hydraulic Model Design Criteria
Discipline Design Criteria:

A – Architectural
C – Civil
E - Electrical
M - Mechanical
P – Plumbing
S - Structural

Within major Project elements describe the approach to each of the following technical aspects:

1. Design criteria used and comparison to Project Technical Requirements (Fixed and Indicative Design Criteria). Indicate approach for the Fixed Design Criteria and any deviations from the Indicative Design Criteria using Form F-1 Project Design Criteria.
2. Operational strategies for unit process and equipment.
3. Construction sequence narrative including identifying shut-downs and temporary facilities (electricity, water, conveyance or others).
4. List required standard operating procedures and operating manuals to be provided.

Drawings. Design-Builder shall include drawings in Appendix D – Design Drawings to illustrate and document its proposed technical design approach for the Representative Project (or approved Proposed Modified Project) and to complement the technical narrative. Reference shall be made to drawings within the major element narratives.

It is anticipated that the Respondent will use the provided project information in Attachment C – Project Background Documents, Attachment D – Project BIM Files, Attachment E – Technical Specifications, Attachment F – Project Design Criteria, as the basis for their design of the Representative Project (or approved Proposed Modified Project).

Organization. Drawings shall be organized first by area and then by discipline matching the organization as listed in the CAD Design Standards and Specifications at www.kcwater.us.

Content. Naming convention shall be consistent with the drawing list provided as part of the Project Technical Requirements. At a minimum, the following drawings shall be prepared and submitted by the Respondent, with the drawings being 11" x 17" size, indicate north on layouts, and use 1/4" or 1/8" scale (facility and layout drawings):

General
- Cover sheet
- Index of Drawings
- Legend, abbreviations and general notes
- Hydraulic Calculations (Final) – include hydraulic losses for service lines being replaced with different pipe size or different cross sectional areas.
- Process Flow Diagram (PFD) – indicate major equipment, tanks and channels, major piping complete with valves, control elements, pipe size and pipe material. PFDs formatted to be used as P&IDs

Preliminary Design (20%)		
Discipline	**Percent Complete**	**Description**
Site Civil	30	• Area surveyed or dimensions given • Site plan • Existing utilities identified with capacities • Show points of connections for Utilities • Final Siting Major Equipment/Structures
Structural	10	• Existing Structures evaluated for pipe supports
Mechanical (process piping)	60	• Process Piping Arrangement • Sections and Elevations • Hydrant Detail • Piping Isometrics
HVAC	N/A	(HVAC not anticipated)
Plumbing	N/A	(No changes to plumbing in tunnel)
Division 1s	N/A	(Refer to Attachment A – Scope of Design-Build Services)

Equipment Cut Sheets. Respondent shall indicate whether they are using joining method for pipes in this project.

4.3.4.3. TP Part 3 – Construction Scheduling, Planning and Sequencing

Provide a summary version of the Respondent's proposed project schedule. Summarized schedule will include the Respondents proposed dates for achieving the Design, Construction, and Extended Commissioning milestones - these proposed dates will be included within the Agreement executed by the City and successful Respondent.

Respondents shall: (a) describe construction sequencing of major Project elements and how sequencing may affect the critical path; (b) discuss any concerns with the capacity to meet the Project's schedule and how the Respondent will manage the schedule. Respondent shall describe how they would approach site logistics and limitations during construction, such as construction staging areas, etc.

Respondent shall develop a detailed Project Schedule and provided within Appendix D (Construction Schedule) of its Proposal. The detailed Project Schedule shall be a preliminary resource-loaded CPM construction schedule without any reference to cost, prepared using Microsoft Project 2007 or later format. Include no more than thirty (30) individual activities, for identifying tasks, durations, and key milestones during the design, construction, and commissioning phases. Show milestones for key decision points, milestones, shutdown periods, OCCP and permit review periods for WSD and AHJs, approvals, purchasing and testing dates associated with Schedule based upon the City's anticipated award date. Include time for permit or regulatory approval processes required prior and during construction. Include schedule for start-up and commissioning period and performance verification testing.

4.3.4.4. TP Part 4 – MBE/WBE Utilization

City desires that Minority Business Enterprises (MBE) and Women's Business Enterprises (WBE) have a maximum opportunity to participate in the performance of City contracts. The goals for this specific Project are **14% MBE** participation and **14% WBE** participation. The Respondent shall identify any MBE/WBE subconsultants or subcontractors that are part of the Respondent's Project Team.

The City's CREO Forms and CREO Instructions for Construction Projects are incorporated into this RFP and the Contract Documents. The MBE/WBE Directory is available on the City's website at www.kcmo.org. Please call the Civil Rights and Equal Opportunity Department at (816) 513-1836 for assistance.

Waiver of MBE/WBE Requirements. The City Council may waive any and all MBE/WBE requirements imposed by any Bidding Document or the MBE/WBE Ordinance and Contract with the lowest and best Bidder if the City Council determines a waiver is in the best interests of the City.

Workforce Program Requirements. City desires that minorities and women have a maximum opportunity to practice their trades on city construction projects. The minimum company-wide goals are a ten percent (10%) minority workforce and two percent (2%) women workforce. The City's HRD Forms and HRD Instructions for Construction Projects are incorporated into this RFP and the Contract Documents.

4.3.5 Cost Proposal

The **Cost Proposal** must include the following:

- Cost Proposal
    - DB 00410 Design-Build Bid Form/Affidavit of Intended Utilization
    - 00430 Bid Bond

A Proposal submitted in response to this RFP must contain a Cost Proposal that fully conforms with and satisfies the format and content requirements described herein, and sets forth the Respondent's proposed Fixed Price Design-Build to perform the Design-Build Contract services. In evaluating the Cost Proposal, the City will apply the price evaluation criteria set forth in Section 5 of this RFP. Accordingly, Respondents are required to complete and submit all forms provided in Attachment G (Cost Proposal Forms) and include in their Cost Proposal all other information necessary to permit the City to perform informed evaluation.

DB 00410 Design-Build Bid Form. This form must be completed in its entirety and submitted with the Cost Proposal. Respondent shall provide a price for Design Services and Construction Services, the sum of which comprises the "Base Bid." The Base Bid is the Cost of Work for the Representative Project (or approved Proposed Modified Project), including allowances as described below. Variations or deviations from the Representative Project that do not have City approval shall be excluded.

THE COST PROPOSAL SHALL BE SUBMITTED, IN A SEPARATE SEALED ENVELOPE OR PACKAGE CLEARLY MARKED "COST PROPOSAL."

ALL PRICE AND COST INFORMATION SHALL BE INCLUDED ONLY IN THE COST PROPOSAL. NO PRICE INFORMATION SHALL BE INCLUDED IN THE OTHER PARTS OF THE PROPOSAL (INCLUDING THE TRANSMITTAL LETTER AND APPENDICES). IF ANY PRICE INFORMATION IS INCLUDED IN THE OTHER PARTS OF THE PROPOSAL, THE ENTIRE PROPOSAL MAY BE REJECTED.

4.3.6 Appendices (Does not count toward page count)

4.3.6.1. Appendix A - Forms for Affirmation and Compliance

Include in Appendix A of the Proposal the completed forms provided in RFP Attachment H (Submission Forms including HRD Documents).

- Copies of Missouri Construction and Engineering Licenses for Lead Contractor, Design Manager, and Engineer of Record (and/or letter of commitment to retain licenses by Issuance of RFP)
- Joint Venture Agreement (if applicable)
- Bonding Capacity (notarized letter confirming Design-Builder can meet minimum bonding requirements)
- Declaration of Insurance (notarized letter confirming Design-Builder can meet required limits)
- DB 00210.01 Design-Build Background Information Form
- Additional Information Related to Termination for Default, Criminal Convictions, and Debarment
- Form 00515.01 Employee Eligibility Verification Affidavit

4.3.6.2. Appendix B – Resumés

In accordance with Section 4.3.3 of this RFP, for any Key Personnel that the Respondent intends to use that are identified in its SOQ and for the Lead Operations Coordinator, Respondent shall provide resumes for such individuals within Appendix B. Provide certifications and licenses for the Lead Operations Coordinator and new Key Personnel (if applicable), and otherwise required by Section 4.3.3.2.

4.3.6.3. Appendix C - Safety & Quality Documentation

Safety Record. Design-Builder must provide information concerning the Design-Builder's safety record, including safety statistics or records indicating categories of accidents and their incidence or frequency rates for the past five (5) years. Include any major incidents and any OSHA or equivalent citations issued. Design-builder may add commentary. The following safety records must be provided for the Lead Contractor for the current and past five (5) years:

The experience modification rate (EMR) calculated by the National Council on Compensation Insurance or similar rating bureau (the EMR is also referred to as the experience modification

rating, experience modification factor, experience modifier or X-mod). The EMR is calculated by comparing a company's actual workers compensation loss data against average loss data for other employers in the same state who share the same industry classification code. The Design-Builder must submit written evidence from an insurance underwriter having a financial rating from A.M. Best & Co. rating of at least A:VII confirming the Design-Builder's current EMR.

The completed Occupational Safety and Health Administration (OSHA) Form 300A, Summary of Work-Related Injuries and Illnesses, or equivalent.

Safety Plan. Design-Builder shall demonstrate that its proposed safety measures, policies, and procedures will maintain a safe construction site and will consider public safety. At a minimum, Design-Builder shall:

- Submit a summary description of the corporate safety program that has been established by the Lead Contractor.

- Provide a description of safety programs or procedures that would be specifically applicable to and utilized for the Project. Include how Respondent proposes to address any unique safety issues for the Project.

- Provide experience, training, and qualifications of onsite safety supervisor.

Quality Control and Management. Respondent shall demonstrate: (a) clear and comprehensive quality assurance and control procedures during both design and construction; and extended commissioning (b) the availability and proposed utilization of established quality management procedures previously implemented on other similar projects. At a minimum, Respondent shall:

- Describe the Design-Builder's quality control and management methods, policies, and procedures during design. This shall include a description of Design-Builder's approach for monitoring and managing the quality of its work from initiation to completion of the Project, including but not limited to checking of all calculations, discipline design checklists, interdisciplinary design checklists, and standardized comment forms that document all check comments and responses for each design submittal. Use of the Revit-based BIM is required for design purposes.

Provide a summary of quality control procedures to be utilized during construction, which includes but is not limited to materials testing for concrete and soils at a minimum, and independent special inspections.

4.3.6.4. Appendix D – Design Drawings

In accordance with Section 4.3.4 of this RFP, Respondent shall provide in Appendix D all design drawings necessary to support the Representative Project (or approved Proposed Modified Project).

4.3.6.5. Appendix E – Past Experience

The City is interested in reviewing the past performance and experience of the members of the Lead Contractor and Lead Designer, including their individual and collective past performance and experience. The Design-Builder shall provide descriptions for a minimum of three (3) reference projects each for the Lead Designer and Lead Contractor to demonstrate experience relevant to the Project. Representative projects shall be projects of similar size, complexity, challenges, and functionality as the Project described in this RFP. A maximum of a total of ten (10) representative projects may be provided.

Each project description shall contain at least the following information:

- Name of Owner.
- Owner reference and contact information.
- Role of Project Team Member.
- Original construction cost, at selection for construction manager at risk and progressive design-build or bid for fixed fee design build and traditional delivery, negotiated Guaranteed Maximum Price if relevant, and final construction cost (and reason for difference between original and final costs).
- Original completion date of project and actual completion date.
- Description of the project showing relevance to this Project.
- Firms and Key Personnel who participated in the project and are included in this SOQ, along with a clear description of the project roles and responsibilities of each. Indicate if the Firms and Key Personnel will have the same role and responsibility on this project.

Include a concise written narrative of the qualifications and experience of the Lead Designer and Lead Contractor that is relevant to the design-build services for the Project. Experience may include projects of subcontractors containing Key Personnel that have a written agreement to provide the scope of work indicated in the narrative to the design-builder on this project at the time of submission. Clearly and specifically identify the in-house capabilities of the Design-Builder and those disciplines for which the entity normally subcontracts.
Design-Builders shall identify the reference projects that demonstrate experience with BIM or 3D-based design and construction models, Envision™ certification, and completed projects funded using SRF and the WIFIA program administered by EPA.

City staff or advisors reserve the right to contact references listed or implied and obtain information on representative projects to confirm the information provided by Design-Builder. The evaluation of Design-Builder for this section may be negatively impacted by the inability to contact and verify references.

International project reference and contact information will be considered only to the extent the Design-Builder is able to provide information herein that adequately describes how the project reference is relevant to projects completed in the United States (e.g., similar project delivery method; similar technologies employed; similar regulatory requirements; similar materials and equipment procurement requirements; etc.).

4.3.6.6. Appendix F – Project Schedule

In accordance with Section 4.3.5 of this RFP, Respondent shall provide in Appendix F a detailed-level schedule for the Project. The schedule shall identify critical path, proposed early work packages, and projected float.

SECTION 5: FINAL PROPOSAL EVALUATION AND SELECTION

5.1 Selection Committee

The City will appoint a committee ("Selection Committee") consisting of no more than five (5) members, which will include staff designated by the WSD Director per Ordinance No. 240324, as deemed necessary, with the expertise appropriate for the evaluation of all technical aspects of the Project. Copies of Proposals will be distributed to the Selection Committee members who will rely on the contents for scoring purposes. The Selection Committee will review the Proposals, excluding the Cost Proposal.

5.2 General Evaluation Procedure

The submission of a Proposal by Respondents shall constitute acknowledgement of acceptance of all terms and conditions set forth in this RFP unless otherwise expressly stated herein. All Proposals must be submitted in writing and must include all required documents including forms, appendices, and other information requested in this RFP.

All Technical Proposals and documents, and meetings related thereto, shall be considered to be "closed records" and "closed meetings," respectively, as defined in Chapter 610, RSMo (the "Missouri Sunshine Law") and therefore protected from disclosure until the Public Bid Opening Date (Section 3.2).

In general, the procedure for evaluation of Proposals and selecting a Design-Builder will consist of the following:

- Selection Committee will open Technical Proposals.

- Selection Committee will review the Technical Proposals (with assistance provided by outside advisors if desired by City) to determine if Responsiveness Requirements and Mandatory (Pass/Fail) Requirements are met.

- City staff may conduct interviews for any or all submitted Proposals.

- Selection Committee will score Technical Proposals based on evaluation criteria described in Section 5.4.

- For those Proposals that meet the Responsiveness Requirements and Mandatory (Pass/Fail) Requirements, the Cost Proposal will be opened publicly as described in Section 5.5.1 Public Bid Opening.

- The ranking of Respondents and the Successful Shortlisted Respondent will be publicly posted of the City's Plan Room Website which will begin the five (5) day appeal period.

- After the five (5) day appeal period has expired and no appeals have been recorded, contract negotiations will begin with the Successful Shortlisted Respondent.

- Award of the Contract for Design-Build Services will be made only after the successful negotiation of the Contract and the City. Council's ordinance adopting the Contract for Design-Build Services takes effect.

During the Proposal evaluation process, written questions or requests for clarifications may be submitted to one or more Respondents regarding its Proposal or related matters. Failure to respond in a timely manner to any such questions or requests may be grounds for elimination of the Respondent from further consideration. Respondent is responsible for the accuracy of its Proposals. Discrepancies between words and figures will be resolved in favor of the words.

5.3 Responsiveness Requirements

Each Proposal will be reviewed to determine whether it is responsive to the RFP. Respondents must comply with all terms and conditions of this RFP, including, without limitation, the requirement to provide all documentation requested in this RFP. Failure to comply with the requirements of this RFP may result in a Proposal being rejected as non-responsive. Each Proposal shall be reviewed for responsiveness in accordance with the following conditions:

1. Timely submittal (refer to Section 4.1 of RFP for the Submittal Due Date).
2. Compliance with submittal requirements in accordance with Section 4 of RFP, including submittal of all information and documentation required in Section 4.

If a Respondent fails to satisfy these conditions, the Proposal may be deemed non-responsive by the City and not considered for further review.

At its sole discretion at any time, however, the City Manager or his delegate may waive any requirements imposed by this solicitation or by any City regulation when failure to grant the waiver will result in an increased cost to the City and the requirement waived would be waived for all Respondents for this solicitation and it is in the best interest of the City to grant the waiver. The City Council at any time may waive any requirements imposed in this solicitation by the City's Code of Ordinances when it finds failure to grant the waiver will result in an increased cost to the City and the waived requirement would be waived for all Respondents for this solicitation and it

is in the best interest of the City to grant the waiver. The City reserves the right to waive any irregularities and/or formalities as deemed appropriate.

The City Council may waive any and all D/M/WBE requirements imposed by any SOQ or Proposal document or the MBE/WBE Ordinance and award the Contract to the most qualified Design-Builder if the City Council determines a waiver is in the best interests of the City.

5.4 Evaluation Criteria

The City will evaluate and rank the responsive Proposals by applying the weighted evaluation criteria set forth below to determine the Successful Respondent. The total number of points that will be used in evaluating all of the factors for a Proposal is 200, allocated as illustrated in the following table:

Criterion	**Maximum Score Possible (Points)**
Statement of Qualifications	Pass/Fail
Tech. Proposal - Part 1. Project Plans/Management Approach	30
Tech. Proposal - Part 2. Technical Approach	60
Tech. Proposal - Part 3. Construction Schedule, Planning and Sequencing	10
Tech. Proposal - Part 4. MBE/WBE Utilization	Pass/Fail
Cost Proposal	100
Total Possible Score	**200**

The highest Technical Proposal will be awarded 100 points. Points will be added to each of the other Technical Proposals corresponding to the 100 points and the original points earned by that Proposal. For example:

Technical Proposal	**Number of Points**	**Score**
Highest	94	100 pts.
2nd Highest	87 (94-87=7)	93 pts. (100-7 points)
3rd Highest	84 (94-84=10)	90 pts. (100-10 points)

5.5 Cost Proposal Evaluation

The Cost Proposal with the lowest Base Bid will be awarded 100 points.

One (1) point will be deducted from each of the other Cost Proposals for each percentage that the Base Bid exceeds the lowest Base Bid using the following formula:

$$\left(1 - \frac{\text{Proposer's Bid - Lowest Bid}}{\text{Lowest Bid}}\right) x\ 100$$

5.5.1 Public Bid Opening

Cost Proposals will be opened publicly on **March 26, 2025 at 2:00 PM** on the Public Bid Opening Date (Section 3.2). The City will publicly announce the scores earned by each Technical Proposal, and then will publicly open and read aloud the corresponding Cost Proposal. Cost Proposal scores will be calculated and added to previously determined Proposal scores. Proposals and corresponding Respondents will be ranked based upon the Proposal scores.

The 48-hour period for providing CREO documents (e.g., CREO Form 8, Contractor Utilization Plan/Request for Waiver) shall begin to run as of this date and time.

5.6 Final Selection

The lowest and best Bid is that Proposal with the highest combined points for the Technical Proposal and Cost Proposal, and that has been determined by the City to be responsive. Respondent agrees that all representations made in its SOQ, its Technical Proposal, and its Cost Proposal shall continue to be binding on Respondent if it is the successful Respondent on the Project, and that this RFP, the RFQ, Respondent's Technical Proposal, Respondent's Cost Proposal, and Respondent's SOQ shall be deemed incorporated into any Contract issued to Respondent for the Project.

After the evaluation process is complete, the City will notify Respondents of the rankings. The top-ranked Respondent will be selected to serve as the Design-Builder and to begin negotiations with the City for the Contract for Design-Build Services award. If negotiations with the top-ranked Respondent are not successful, the City will select the next-ranked Respondent for award and negotiate the final terms of the Contract.

SECTION 6: CONDITIONS FOR RESPONDENTS

6.1 City Policies and Ordinances

The City will administer the RFP process under competitive proposal policies. The following is a summary of some of the policies and ordinance packages to be followed and completed as part of the RFP process. The City encourages and expects Proposers to pursue subcontracting, mentoring, joint venturing, teaming and partnering opportunities with the types of firms described in this Section in the ordinary course of its teaming/business strategies for all aspects of the Project. Additional policies and ordinances otherwise not specifically listed below may also apply at time of the Proposal.

- Code of Ordinances, Sections 3-501 through 3-525, also known as the "Workforce Program."

6.2 Prohibited Activities by Former City Employees and Officials

Section 2-2044 of the City's Code prohibits former elected City officials and former executive or administrative employees of the City from trying to influence a decision of the City on behalf of an employer or client for one year after that former employee or official leaves the City's employ. By submitting an RFP, the Design-Builder affirms that Design-Builder and its team members and employees are in compliance with the requirements of Section 2-2044. Failure to comply with the requirements of Section 2-1018 may cause the SOQ and Proposal to be rejected.

6.3 Change in RFP, Contract and Additional Work

The City reserves the right to add to, delete, modify or enlarge this RFP, including any specifications and/or statement of work, the proposed contract, the terms and conditions, and any subsequently executed contract. The City reserves the right to award additional contracts for related work or subsequent Project phases to the selected Design-Builder.

6.4 Late Proposals

Proposals and modifications of proposals received after the exact hour and date specified for receipt will not be considered unless: (1) they are sent via the U.S. Postal Service, common carrier or contract carrier, by a delivery method that guarantees the proposal will be delivered to the City prior to the submission deadline; or (2) if submitted by mail, common carrier or contract carrier it is determined by the City that the late receipt was due solely to an error by the US Postal Service, common carrier or contract carrier; or (3) the Proposal is timely delivered to the City but is at a different City location than that specified in this RFP; or (4) the City extends the time after the deadline for a force majeure event that could potentially affect any or all Respondents meeting the deadline.

6.5 Interviews, Discussions and Negotiations with Design-Builders

The Respondent's Proposals, including any proposed personnel and any other required proposal documents may be subject to negotiation by the City at any time. The City may interview none, one, some or all of the Respondents that submit Proposals. Proposals may be evaluated and award made with or without discussions and/or negotiations with the Respondent. The City reserves the right to request additional information from any or all Respondents. Negotiations by the City will not be deemed a counteroffer or a rejection of any original SOQ or Proposal.

6.6 Rejection of Proposals

If the City rejects all Proposals, the City may re-solicit Proposals only from those Respondents who submitted a Proposal pursuant to this RFP and/or use an expedited Bid submission schedule with or without re-advertising or issuing any other public notice when the City determines, in its sole discretion, that the delay due to the normal solicitation procedures would not be in the City's best interests.

6.7 Disclosure of Proprietary Information

A Respondent may restrict the disclosure of scientific and technological innovations in which it has a proprietary interest, or other information that is protected from public disclosure by law, which is contained in any portion of its Proposal by:

a. Marking each page of each such document in at least 16-point font with the words "Proprietary Information"; and

b. Printing each page of such document on a different color paper than the paper on which the remainder of the Proposal is printed; and

c. Segregating each page of each such portion of its Technical Proposal in a sealed envelope/package, which shall prominently display, on the outside, the words "Proprietary Information" in at least 16-point font, along with the name and address of the Respondent; and

d. After either the Public Bid Opening Date or the rejection of all Proposals, if a request is made under the Missouri Sunshine Law for access to portion(s) of a Respondent's Technical Proposal that has been marked "Proprietary Information," as provided above, the City will notify that Respondent of the request, and it shall be the burden of that Respondent to establish that such documents are exempt from disclosure under the law.

6.8 Contract Information Management System

The selected Design-Builder shall be required to use City's Internet web based Contract Information Management System/Project Management Communications Tool provided by City and protocols included in that software during the term of this Contract. The selected Design-Builder shall submit user applications to City's provided Contract Information Management

System for all personnel, subcontractors or suppliers as applicable. The City will use e-Builder (by Trimble) for document control and workflows.

6.9 Affirmative Action

It is the policy of the City that any person or entity entering into a contract with the City, will employ applicants and treat employees equally without regard to their race, color, sex, religion, national origin or ancestry, disability, sexual orientation, gender identity or age. The City's Affirmative Action ordinance requires that any person or entity who employs fifty (50) or more persons and is awarded a contract from the City totaling more than $300,000.00 must:

- Execute and submit an affidavit, in a form prescribed by the City, warranting that the contractor has an affirmative action program in place and will maintain the affirmative action program in place for the duration of the contract.

- Submit, in print or electronic format, a copy of the contractor's current certificate of compliance to the City's CREO prior to receiving the first payment under the contract, unless a copy has already been submitted to CREO at any point within the previous two calendar years. If, and only if, contractor does not possess a current certification of compliance, contractor shall submit, in print or electronic format, a copy of its affirmative action program to CREO prior to receiving the first payment under the contract, unless a copy has already been submitted to CREO at any point within the previous two calendar years.

- Require any subcontractor awarded a subcontract exceeding $300,000.00 to affirm that subcontractor has an affirmative action program in place and will maintain the affirmative action program in place for the duration of the subcontract.

- Obtain from any subcontractor awarded a subcontract exceeding $300,000.00 a copy of the subcontractor's current certificate of compliance and tender a copy of the same, in print or electronic format, to CREO within thirty (30) days from the date the subcontract is executed. If, and only if, subcontractor does not possess a current certificate of compliance, contractor shall obtain a copy of the subcontractor's affirmative action program and tender a copy of the same, in print or electronic format, to CREO within thirty (30) days from the date the subcontract is executed.

- If you have any questions regarding the City's Affirmative Action requirements, please contact CREO at (816) 513-1836 or visit the City's website at www.kcmo.org.

6.10 American with Disabilities Act (ADA) Standards

It is the policy of the City and required by law that any new or renovated facility meet the scoping and technical requirements of the 2010 ADA Standards for newly designed and constructed or altered local government facilities, public accommodations, and facilities. The selected Design-Builder shall design the project so it conforms to the 2010 ADA Standards, as applicable and as amended from time to time, and is readily accessible to and usable by individuals with disabilities.

The City will make available to the selected Design-Builder the City's ADA Compliance Manager, who can facilitate interaction with advocates in the disability community.

6.11 Design-Builder Conflict of Interest

A conflict of interest situation may disqualify an organization. If the Design-Builder believes there may be a conflict of interest, it must list the organizations and the names of entities or persons associated with the Design-Builder who may have a conflict of interest, or appearance of a conflict of interest, with the City.

Details of the potential conflict of interest must also be included. Names of entities associated with the Design-Builder who may have a conflict of interest with any activity of this Project should be included in the Proposal. Provide details and reasons. Design-Builders are subject to disqualification on the basis of conflict of interest as determined by the City.

6.12 Additional Information

The City reserves the right, in its sole discretion, to request additional information or documents from any or all Respondents, including supplements or corrections to the Proposals.

6.13 City's Buy American and Missouri Preference Policies

It is the policy of the City that any manufactured goods or commodities used or supplied in the performance of any City contract or any subcontract thereto shall be manufactured or produced in the United States whenever possible. When Bids offer quality, price, conformity with specifications, term of delivery and other conditions imposed in the specifications that are equal, the City shall select the Bid that uses manufactured goods or commodities that are manufactured or produced in the United States. The City shall give preference to all commodities manufactured, produced, or grown within the State of Missouri and to all firms, corporations, or individuals doing business as Missouri firms, corporations or individuals, when quality is equal or better and delivered price is the same or less. It is the bidder's responsibility to claim these preferences.

6.14 Tax Clearance

Respondent will be required to furnish to Owner sufficient proof from City's Commissioner of Revenue, verifying that Respondent is in compliance with the license and tax ordinances administered by City's Revenue Division as a precondition to Owner making its first payment under any Contract over $50,000.00. Respondent will also be required to obtain proof of City tax compliance from all of its Subcontractors prior to the Subcontractors performing any Work.

6.15 Prevailing Wage Requirements

The successful Respondent shall pay the prevailing hourly rate of wages as determined by the Missouri Annual Wage Order and/or Federal Wage Determination set forth in the Project Manual. In case of a conflict between Missouri and Federal wage rates, the higher rate shall apply.

6.16 Indemnification – City of Kansas City

The contract documents contains a requirement that Contractor shall indemnify, defend and hold harmless the City and any of its agencies, officials, officers, or employees from and against all claims, damages, liability, losses, costs, and expenses, including reasonable attorneys' fees, arising out of or resulting from any acts or omissions in connection with the contract, caused in whole or in part by Contractor, its employees, agents, or Subcontractors, or caused by others for whom Contractor is liable, including negligent acts or omissions of the City, its agencies, officials, officers, or employees. The contract requires Contractor to obtain specified limits of insurance to insure the indemnity obligation. Contractor has the opportunity to recover the cost of the required insurance in the Contract Price by including the cost of that insurance in the Bid amount.

6.17 Indemnification – State of Missouri

The contract documents contains a requirement that Contractor shall indemnify, defend and hold harmless the Missouri Highways and Transportation Commission (MHTC) and the Missouri Department of Transportation (MoDOT) and their respective employees from and against all claims, damages, liability, losses, costs, and expenses, including reasonable attorneys' fees, arising out of or resulting from any acts or omissions in connection with the contract, caused in whole or in part by Contractor, its employees, agents, or Subcontractors, or caused by others for whom Contractor is liable. The contract requires Contractor to obtain specified limits of insurance to insure the indemnity obligation. Contractor has the opportunity to recover the cost of the required insurance in the Contract Price by including the cost of that insurance in the Bid amount.

SECTION 01000 – GENERAL PROJECT REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. This section covers the general project requirements for all projects.

B. The work to be performed under these Contract Documents shall be consistent with Construction General Conditions, or Design-Build General Conditions in the construction, installation, and completion of all project work.

C. Project Delivery. For Work under a traditional construction contract, this Section shall be performed by "Contractor." Work under an alternative project delivery or Design-Build contract shall be performed by "Design-Builder."

1. All uses of the word "Contractor" listed in all Sections shall be substituted from "Contractor" to "Design-Builder."
2. References to General Conditions and/or supplementary conditions listed in all Sections shall be substituted from "Section 00700 – General Conditions, Section 00800 – Supplementary Conditions," to "Design-Build General Conditions of Contract"

1.02 RELATED SECTIONS

A. Section DB 00700 – General Conditions (Design-Build Project Delivery)

B. Section DB 00800 – Supplementary Conditions (Design-Build Project Delivery)

C. Section 00700 – General Conditions (Design-Bid-Build Project Delivery)

D. Section 00800 – Supplementary Conditions (Design-Bid-Build Project Delivery)

E. Section 01020 – Record Documents.

F. Section 01300 – Submittals.

G. Section 01329 - Safety Plan

H. Section 01353 – Selective Alterations and Demolition

I. Section 01566 – Cleanup Operations.

J. Section 01570 – Temporary Erosion Control.

K. Section 01580 – Project Signs.

L. Section 01581 – Public Communications.

M. Section 02180 – Clearing and Grubbing.

N. Section 02300 – Earthwork.

1.03 CODES AND STANDARDS

A. By reference, as applicable for the Work being performed.

1.04 SUBMITTALS

A. Submit as specified in Section 01300 – Submittals.

B. Project Communications:

1. Progress Meeting Minutes.

C. Other:

1. Description and location of offsite storage arrangements.
2. Construction Site Plan.
3. Safety Representative.

1.05 QUALITY ASSURANCE

A. The Contractor is responsible for the quality assurance and quality control of the Work.

1.06 TRAVEL

A. Projects with integrated systems, systems not currently in use by City, systems currently in pilot testing, or proprietary technology shall require an on-site tour by City and its designated stakeholders. All U.S. domestic travel for City employees shall be furnished by the City. All international travel for City employees shall be provided by Contractor.
B. Contractor and City's designated representative shall be present for witness inspections during Factory Acceptance tests and as required by the commissioning plan.

1.07 MATERIALS SELECTION AND ACQUISITION

A. The Contractor shall not use materials or equipment removed from existing premises, except as specifically permitted by the Contract Documents. All products shall be new, never used before, unless otherwise specified.
B. Provide interchangeable components of the same manufacturer, for similar removable components, such as: T-bolts, glands, gaskets, manhole rings and covers, nuts, wiring, slip rings, conduit, bolts, seals, etc.

1.08 CONSTRUCTION SITE PLAN

A. The Contractor shall submit a site plan showing the locations and dimensions of temporary facilities which include, but are not limited to, the following layouts and details:
    1. Equipment and material storage area on City property and bonded warehouses).
    2. Access and traffic routes.
    3. Indicate if a supplemental or off-site staging area is being utilized.
    4. Show locations of safety and construction fencing, job site trailer, construction entrances, trash dumpsters, temporary sanitary facilities and parking areas for project personnel.
    5. Indicate locations of concrete washout facilities.

1.09 EASEMENTS AND RIGHTS-OF-WAY

A. The City will furnish the Site in accordance with Section 00700 - General Conditions. The Contractor shall confine construction operations to the immediate vicinity of the Site shown in the Contract Documents and shall use due care in placing construction tools, equipment, excavated materials, construction materials and supplies to cause the least possible damage to public and private property and least possible interference with public traffic.
B. On Private Property:
    1. The permanent easements are as noted in the Contract Documents. No additional temporary construction easements have been obtained, unless otherwise indicated in the Contract Documents. The Contractor shall set stakes to mark the boundaries of construction easements across each private property. The stakes shall be protected and maintained until completion of the Work. After cleanup has been completed in accordance with Section 01566 – Cleanup Operations, the Contractor shall remove all construction stakes.

2. The Contractor shall not enter any private property outside the designated construction easement boundaries without written permission from the owner of the property and notification to the RPR
3. Should it become necessary to use or occupy the land beyond the limits of the Site (as defined by General Conditions), the Contractor shall obtain a written agreement with each affected property owner and tenant. Each agreement shall clearly outline the terms for which the Contractor may utilize the property and shall be fully executed by the Contractor, the property owner and the tenant (when applicable).
4. Whenever the easement is occupied by crops which will be damaged by construction operations, the Contractor shall notify the property owner sufficiently in advance so that the crops may be removed before the Work is started. The Contractor is responsible for all damage to crops outside the easement and shall make satisfactory settlement for the damage directly with the property owner.
5. Where the Work impacts fields that are leveled for irrigation or terraced, the Contractor shall relevel irrigated fields and replace all terraces to their original or better condition and to the satisfaction of the property owner.

C. State Highways:
1. All work within MoDOT right-of-way shall be in conformance with MoDOT regulations. The permit must be secured before any construction is started within MoDOT right-of-way.

1.10 LINES AND GRADES

A. All Work shall be done to the lines, grades and elevations indicated in the Contract Documents.
B. Basic horizontal and vertical control points are provided in the Contract Documents. All additional survey, layout and measurement work shall be performed by the Contractor as a part of the Work.
C. The Contractor shall provide an experienced surveyor, competent assistants and all instruments, tools, stakes and other materials required to complete the survey, layout and measurement work.
D. The Contractor shall provide qualified personnel, materials and equipment (tools, stakes and other materials) as may be required for the following tasks needed in the Work:
1. Establish or designate control points.
2. Establish construction easement boundaries.
3. Verify survey.
4. Verify layout shown on the Contract Documents.
5. Verify and document work performed by the Contractor.

These efforts shall be included in the Contractor's bid price and performed at no additional cost to the City.
E. The Contractor shall remove and reconstruct, at no additional cost to the City, any Work that was improperly installed or improperly located.
F. See Section 01020 – Record Documents, paragraph SURVEY REQUIREMENTS for additional requirements.

1.11 CONNECTIONS TO EXISTING FACILITIES

A. Unless otherwise specified or indicated in the drawings, the Contractor or Design-Builder shall make all necessary connections to existing facilities. This includes, but is not limited to, structures, drain lines, water utilities, sewer utilities, gas utilities, communications utilities and electric utilities. In each case, the Contractor or shall receive permission from the City or the owning utility prior to undertaking a connection or disconnection. The Contractor shall protect facilities against deleterious substances and damage.

B. Connections to existing facilities that are in service shall be thoroughly planned in advance. See 01140, 01140.01 01140.02 All required equipment, material and labor shall be on hand at the time of undertaking the connections.

1.12 UNFAVORABLE CONSTRUCTION CONDITIONS.

A. During unfavorable weather, wet ground, or other unsuitable construction conditions, the Contractor shall confine operations to Work that will not be adversely affected by such conditions.

B. No portion of the Work shall be constructed under conditions that would adversely affect the quality or efficiency thereof, unless special means or precautions are taken by the Contractor to perform the Work in a manner acceptable to the City.

1.13 UNDERGROUND FACILITIES AND ASSOCIATED RESTORATION

A. As provided in the General Conditions, the Contractor shall perform all cutting and patching required for the Work and as may be necessary in connection with locating all underground facilities, installation of Work, uncovering Work for inspection or for the correction of defective Work.

B. The Contractor shall perform all cutting and patching required for and in connection with the Work, including but not limited to the following:
   1. Removal of improperly timed Work.
   2. Removal of samples of installed materials for testing.
   3. Alteration of existing facilities.
   4. Installation of new Work.

C. The Contractor shall provide all shoring, bracing, supports and protective devices necessary to safeguard all Work and existing facilities during cutting and patching operations. The Contractor shall not undertake any cutting or demolition that may affect the structural stability of the Work or existing facilities without City's approval.

D. Materials shall be cut and removed as required to complete the Work. Materials shall be removed in a careful manner, with no damage to adjacent facilities or materials. The Contractor shall remove all excavated materials from the site that cannot be incorporated in the Work.

E. All Work and existing facilities affected by cutting operations shall be restored with new materials, or with salvaged materials acceptable to City, to obtain a finished installation with strength, appearance and functional capacity required to match the existing area. If necessary, entire surfaces shall be patched and refinished.

F. The Contractor, at no extra cost to the City, shall replace all surface features damaged, removed or so designated to be replaced.

G. Contractor shall at no cost provide photographic documentation of all exposed work after excavation prior to additional underground work and prior to backfill. Photos shall be taken from as many angles as possible.

1.14 ENVIRONMENTAL PROTECTION

A. Laws and Regulations:
   1. The Contractor shall conform to all laws and regulations as required by Section 00700 – General Conditions,

B. Storm Water Runoff:
   1. Storm Water Pollution Prevention Plan (SWPPP): As required by Section 00700 – General Conditions
   2. Erosion Sediment Control: See Paragraph 1.25.
   3. The Contractor shall prevent the pollution of drains and watercourses by sanitary wastes, sediment, debris and other substances resulting from construction activities. See paragraph 1.38.
   4. Dewatering: As required by Section 02200 – Earthwork.
   5. Concrete Washout Facilities: As required by Section 01566 – Cleanup Operations.

C. Air Pollution:
   1. Burning: No open burning will be permitted.
   2. Dust Control: See paragraph 1.37.

D. Other Construction Activities:
   1. Disposal of Demolition Material: As required by Section 01352 – Selective Alterations and Demolition.
   2. Disposal of Debris: Section 02180 – Clearing and Grubbing and Section 02300 – Earthwork.
   3. Protection of Wetlands: As shown on the Drawings or Section 01140 Work Restrictions
   4. Floodplains: As shown on the Drawings or Section 01140 Work Restrictions
   5. Cleanup and Site Maintenance: As required by Section 01566 – Cleanup Operations.

1.15 LICENSES, PERMITS, AND CERTIFICATES

A. Requirements for licenses, permits and certificates are provided in Section 00700 – General Conditions, paragraph 6.09.

B. Permitting exceptions (if any) are noted in Section 00800 – Supplementary Conditions.

1.16 APPLICABLE CODES

A. Standard specifications of the Kansas City, Missouri Department of Public Works are, by reference, hereby made a part of this contract specifications.

1.17 REFERENCE STANDARDS

A. See Section 00700 – General Conditions, paragraph 3.02 for references to standards and specifications of technical societies.

B. All technical standards shall adhere to the KC Water – Rules and regulations unless otherwise specified in Contract Documents.
   https://www.kcwater.us/projects/rulesandregulations

1.18 PRECONSTRUCTION CONFERENCE

A. A Preconstruction Conference will be held in accordance with Article 2 of the General Conditions. The conference will be held at a mutually agreed time and location. The conference shall be attended by:
   1. Contractor and the project superintendent(s).
   2. Design Professional(s) (Engineer of Record) and Owner's Advisor if applicable
   3. Resident Project Representative(s).
   4. City's Representative
   5. City's CREO Representative
   6. Other City Staff (Engineering, Operations, etc…)

B. Other participants as requested by the Contractor, or City; such as the following:
   1. Principal Subcontractors such as Systems Integrator, Electrical, shoring, Mechanical, concrete etc..
   2. Representative of principal suppliers and manufacturers as appropriate.
   3. Utility Company representatives.
   4. Affected Property Owners and other stakeholders
   5. Governmental representatives as appropriate.
   6. The Contractor or Design-Builder shall bring to the conference the Preliminary Schedules described in Article 2 of the General Conditions (Preliminary Project Schedule, Preliminary Schedule of Values, Preliminary Schedule of Shop Drawings and Samples), major outages, OCCPs, suggested communication routes, a draft risk register, and list of project goals.

C. The purpose of the conference is to designate responsible personnel and to establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The agenda shall include, but not limited to, the following:
   1. Contractor's Preliminary Schedules.
   2. Document Management
   3. Timing the Monthly Schedule Update
   4. Processing Applications for Payment.
   5. Commissioning Plan including the Commissioning Manager
   6. Maintaining record documents
   7. electronic data requirements including Electronic O&M manuals and BIM (if applicable)
   8. Critical Work sequences
   9. Field decisions and Change Orders.
   10. Use of premises, field office, material storage areas, security, housekeeping, and City's needs.
   11. Major equipment deliveries and priorities.
   12. Contractor or Design-Builder's assignment for Safety Representative.
   13. Discussion of the Safety Plan (See Section 01329 –Safety Plan)
   14. Expectations and the Contractor or Design-Builder's plan for Environmental Protection.

D. Contractor will preside at the conference, will arrange for keeping the minutes and will distribute draft minutes to all persons in attendance within one business day.

1.19 PROGRESS MEETINGS

A. The Contractor shall schedule and hold progress meetings weekly unless mutual agreed upon, and, at other times as requested by the City or as needed by the progress of the Work. The duration of the weekly meetings will mutually agree upon by the City and Contractor. The Contracto,, City, Design Professional, and all Subcontractors active on the Site shall be represented at each meeting. The Contractor or Design-Builder may, at their discretion, request attendance of their suppliers, manufacturers or other utilities.
B. The Contractor shall preside at the meeting. Meeting minutes shall be prepared and distributed by the Contractor after review by the City or Design Professional. The purpose of the meetings will be to review the progress of the Work, maintain coordination of efforts, discuss changes in scheduling and resolve problems which may have developed on the project.
C. Draft meeting minutes will be distributed within one business day.

1.20 SAFETY REPRESENTIVE

A. In accordance with Section 00700 – General Conditions, the Contractor shall submit the name and complete contact information for the person designated as the Safety Representative for the Project.
B. In accordance with Section 01300 – Submittals, This information shall be submitted prior to the Preconstruction Conference.
C. If the Safety Representative changes during the Project, the Contractor shall designate a new person to fulfill the role and submit their name and complete contact information.

1.21 SAEFTY PLAN

A. See Section 01329 – Safety Plan.

1.22 SITE ADMINISTRATION

A. The Contractor is responsible for all areas of the site used by their personnel and all Subcontractors in the performance of the Work. The Contractor will exert full control over the actions of all employees and other persons with respect to the use and preservation of property and existing facilities, except such controls as may be specifically reserved to Owner or others. The Contractor or Design-Builder has the right to exclude from the site all persons who have no purpose related to the Work or its inspection and may require all persons on the site to observe the same regulations as their personnel.

1.23 CLEAN-UP

A. The Contractor shall conduct cleanup operations in accordance with Section 01566 – Project Cleanup.

1.24 SUBSTANTIAL COMPLETION WALKTHROUGH

A. See Section -00700 – General Condition Article 14.04.
B. Walkthrough will also include City Employees from the operating division as designed by their Division Manager.

1.25 FINAL ACCEPTANCE

A. Final Acceptance of the Work shall be in accordance with Section 00700 – General Conditions, Article 14.

1.26 EROSION AND SEDIMENT CONTROL

A. Work associated with erosion and sedimentation control shall be done in accordance with Section 01570 – Temporary Erosion and Sediment Control.

1.27 STREET LIGHTS AND SITE LIGHTING

A. Relocation or restoration of streetlights and Site lighting due to construction interference shall be included in the Contractor or Design-Builder's Bid Price. No separate measurement and payment will be made. The Contractor or Design-Builder shall notify and coordinate street light relocations with the Public Works Department:

Street Lights Division
Phone: (816) 513-9500.

1.28 PROJECT SIGNS

A. Work associated with Project signs shall be done in accordance with Section 01580 – Project Signs.

1.29 RESTORATION

A. The Contractor shall replace all surface material and shall restore all paving, curbs, gutters, sidewalks, driveways, shrubbery, fences, sod, walls, floors, roofs, piping, conduit, cable trays, HVAC equipment, architecture features, drains, gravel, coating systems, fences, furniture, tiling, fixtures, masonry, structural supports, doors, windows, skylights and all other features disturbed to a condition of equal to or better than before the work began, furnishing all material, labor and equipment incidental thereto.

1.30 WATER

A. The City will furnish, without charge, all water necessary for the Work (i.e., filling, flushing, testing and disinfecting completed water lines). The Contractor or Design-Builder shall make arrangements with the City for all water used.
B. Use of the City's water facilities shall be at the direction of the Water Services Department so that water is not wasted and service to customers is not impaired.
C. Any water furnished by the City must be obtained from an existing City main.
D. The Contractor shall use a Reduced Pressure Zone (R.P.Z.) Backflow Preventer and meter when connected to the City's water system.

E. When utilizing public hydrants, The Contractor shall contact the Kansas City Fire Department (KCFD) at (816) 513-4645 to purchase a hydrant meter permit. After securing a hydrant meter permit from KCFD, the Contractor shall present the permit to the Consumer Services desk located at Water Services Department headquarters, 4800 E. 63rd Street, KCMO. The Contractor shall apply for and pay Consumer Services the refundable security deposit. If approved, the Contractor or Design-Builder shall contact the Water Services Backflow Department at (816) 513-4797 to schedule the installation of the R.P.Z./Meter (hydrant meter). The Contractor shall provide the location of the hydrant where the R.P.Z./Meter is to be installed. The Contractor shall contact the Backflow Department to have the R.P.Z./Meter moved or returned to Water Services. Jetting and Vacuum trucks with approved backflow prevention devices or air gap separation are not required to utilize a R.P.Z. backflow preventer; however, a meter to track water usage shall be used at all times. The Jetter/Vac Contractor shall contact the Water Services Backflow Department for

issuance of the meter and pay the associated refundable security deposit. In all cases, the Contractor is solely responsible for any and all damage to the equipment issued by the Water Services Backflow Department. The cost to repair the damage or the cost of complete replacement of the unit shall be deducted from the security deposit.

F. When utilizing hydrants on City projects after the facility's water meter, Contractor shall utilize an RPZ/Meter that is pre-approved by the City. The location and duration for the connection must be submitted 15 days prior to the proposed connection. Any unapproved connections will be grounds for removal from the Site(s) by the connecting Contractor or Subcontractor.

1.31 G. ALL COSTS FOR LABOR, MATERIAL, EQUIPMENT AND SERVICES NEEDED TO OBTAIN WATER FOR CONSTRUCTION PURPOSES SHALL BE INCLUDED IN THE BID. NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE TO MAKE CONNECTIONS.OPERATION OF EXISTING VALVES

A. The Contractor shall not operate any valves on the City's system outside the fence line without direct supervision from a Water Services Department representative.
B. OCCP may allow for the contractor to operate valves and equipment.
C. If the Contractor needs valves operated, the request shall be made at least five (5) days in advance to Water Services for such operation, also giving notice to any affected customers/properties in accordance with the notification requirements outlined in Section 01581 – Public Communications.
D. All fire hydrants and water valves shall be kept free from obstruction and available for use at all times.

1.32 BARRICADES AND LIGHTS

A. All streets, roads, highways, facility roads, and other public thoroughfares which are closed to traffic shall be protected by effective barricades and acceptable warning signs. Barricades shall be located per the approved traffic control plan and associated permit. RPR will approve the barricades for facility roads.
B. All trenches and other excavations shall be covered and shall have suitable barricades, signs and lights to provide adequate protection to the public and City Staff. Obstructions such as material piles and equipment shall be provided with similar warning signs and lights in roads.
   All barricades and obstructions shall be illuminated with warning lights from sunset to sunrise in the public right of way. Material storage and execution of the Work on or alongside public streets and highways shall cause the minimum obstruction and inconvenience to the traveling public.
C. All barricades, signs, lights and other protective devices shall be installed and maintained in conformity with applicable statutory requirements and as required by the authority having jurisdiction; such as, Work within railroad right-of-way, highway right-of-way, etc.

1.33 EXISTING FENCING

A. All existing fences affected by the Work shall be maintained by the Contractor until completion of the Work. Fences which interfere with construction operations shall not be relocated or dismantled until written permission is obtained from the owner of

the fence including the City and the period the fence may be left relocated or dismantled has been agreed upon.

B. Where fences must be maintained across the construction easement or plant site, adequate gates or City approved access shall be installed. Facility Gates and Gates outside facilities shall be kept closed and locked at all times when not in use. Within Facilities, operations staff will determine what gates will need to be close and locked.

1.34 SAFETY FENCING

A. Provide fencing along the construction site at all open excavations and tunnels to control access if the excavation or tunnel can otherwise be accessed by the public.

B. Temporary safety fencing must be a high visibility orange colored, high density polyethylene grid or approved equal, a minimum of 48 inches high and maximum mesh size of 2 inches, supported and tightly secured to steel posts located on maximum 10-foot centers, constructed at the approved location.

C. Remove the fence from the work site upon completion of the Work.

1.35 PROTECTION OF PUBLIC AND PRIVATE PROPERTY

A. The Contractor shall protect, shore, brace, support, and maintain all underground pipes, conduits, drains and other underground construction uncovered or otherwise affected by the construction operations.

B. All pavement, surfacing, driveways, curbs, gutters, sidewalks, buildings, utility poles, guy wires, fences, and all other features and structures affected by construction operations, together with all sod and shrubs in yards, parkways, medians and green spaces, shall be restored to their original condition, whether within or outside the right-of-way or easement. All replacements shall be made with new materials.

1.36 DAMAGE TO EXISTING PROPERTY

A. The Contractor is solely responsible for any damage to existing features, structures, Work, materials, or equipment because of their operations and shall repair or replace any damaged features, structures, Work, materials, or equipment to the satisfaction of the City and at no additional cost to the City.

B. The Contractor shall protect all existing structures and property from damage and shall provide bracing, shoring, or other work necessary for such protection.

C. The Contractor is responsible for all damage to streets, roads, curbs, sidewalks, highways, shoulders, ditches, embankments, culverts, bridges, or other public or private property, which may be caused by transporting equipment, materials, or personnel to or from the Work. The Contractor shall make satisfactory and acceptable arrangements with the agency having jurisdiction over the damaged property concerning its repair or replacement.

1.37 NOISE CONTROL

A. The Contractor shall conduct construction operations as described herein and in compliance with the City of Kansas City, Missouri Code of Ordinances, Chapter 46 – NOISE CONTROL.

B. The Contractor shall take all reasonable measures to avoid unnecessary noise. Such measures shall be appropriate for the normal ambient sound levels in the area during working hours. All construction machinery and vehicles shall be equipped with practical sound-muffling devices and operated in a manner to cause the least noise, consistent with the efficient performance of the Work.

C. During construction activities on or adjacent to occupied buildings and when appropriate, the Contractor shall erect screens or barriers effective in reducing noise in the building and shall conduct their operations to avoid unnecessary noise which might interfere with the activities of the building occupants.
D. Contractor shall insure no facilities will have noise levels that prevent a full shift at the facility per OSHA safety standards.
E. All work including, but not limited to, excavation, demolition, alteration, or repair being performed in or adjacent to a residential area other than between the hours of 7:00 a.m. and 6:00 p.m. on weekdays, except in the case of urgent necessity in the interest of public safety, shall require a letter of permission from the Water Services Department of the City of Kansas City, Missouri.

1.38 DUST CONTROL

A. The Contractor shall control dust in accordance with Section 01566 – Cleanup Operations, paragraph DUST CONTROL. The Contractor shall take all reasonable measures to prevent unnecessary dust. Earth surfaces subject to dusting shall be kept moist with water or by the approved application of an approved chemical suppressant. When practicable, dusty materials in piles or in transit shall be covered to prevent blowing.
B. Buildings or operating facilities which may be affected adversely by dust shall be adequately protected from dust. Existing or new machinery, motors, instrument panels, or similar equipment shall be protected by suitable dust screens. Proper ventilation shall be included with dust screens.

1.39 POLLUTION CONTROL

A. The Contractor shall prevent the pollution of drains (Combined Sewer, plant piping, Storm Sewer), and watercourses by sanitary wastes, sediment, debris or other substances resulting from the construction activities. No sanitary wastes will be permitted to enter any drain or watercourse other than sanitary sewers. No sediment, debris, or other substance will be permitted to enter sanitary sewers and all reasonable measures will be taken to prevent such materials from entering any drain or watercourse.

1.40 SECURITY

A. The Contractor is solely responsible for security and protection of the site. This includes protecting all Work, materials, equipment, existing facilities and all temporary facilities against theft, vandals and access by unauthorized persons.
B. No claim shall be made against the City by reason of an act of an employee or trespasser. The Contractor shall make good on all damage and theft of property resulting from the Contractor's failure to provide adequate security measures including City Property. After trespass or theft, the City may direct the Contractor to provide additional site security at no cost including but not limited to security cameras, on site security, and night security.

1.41 PARKING

A. The Contractor shall provide and maintain suitable parking areas for the use of all City personnel, construction workers and others performing work or furnishing services in connection with the Project. Suitable parking is required to avoid the need for parking personal vehicles where they may interfere with traffic, City's

operations, or construction activities. Location of the parking within Facilities should be mutually agreed up by the operating division manager and the Contactor. Operating Division Manager may change parking areas as need to maintain operations

PART 2 - PRODUCTS
Not used.

PART 3 - EXECUTION
Not used.

END OF SECTION

SECTION 01019 – CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
    1. Inspection procedures.
    2. Submittals.
    3. Final cleaning.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.
B. Related Sections include the following:
    1. Section DB 00700 – General Conditions (Design-Build Project Delivery)
    2. Section DB 00800 – Supplementary Conditions (Design-Build Project Delivery)
    3. Section 00700 – General Conditions (Design-Bid-Build Project Delivery)
    4. Section 00800 – Supplementary Conditions (Design-Bid-Build Project Delivery)
    5. Section 01015 – Specific Project Requirements.
    6. Section 01020 – Record Documents.
    7. Section 01021 – Operation and Maintenance Data.
    8. Section 01140 – Work Restrictions.
    9. Section 01140.01 - Process and System Shutdown Constraints Schedule.
    10. Section 01140.02 - Operation Change Control Plan Documents.
    11. Section 01300 – Submittal.
    12. Section 01320 – Construction Progress Documentation.
    13. Section 01322 – Photographic Documentation
    14. Section 01335 – Document Management.
    15. Section 01340 – Building Information Modeling (BIM)
    16. Section 01433 – Manufacturers' Field Services
    17. Section 01664 – Training
    18. Section 01757 – Commissioning

1.03 SUBMITTALS

A. All Substantial Completion documents shall be submitted at least 14 calendar days prior to Substantial Completion inspection request.
    1. Specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
    2. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
    3. Prepare and submit Project Record Documents, final operation and maintenance manuals, Record Documents, damage or settlement surveys, property surveys, and similar final record information.
    4. Submit specific warranties, workmanship bonds, maintenance service agreements, and similar documents in accordance with this Section.

5. Submit all manufacturers' certificates in accordance with Section 01433 Manufacturers' Field Services
6. Submit Final Original Equipment Manufacturer Operations & Maintenance (OEM O&M) Manuals for all equipment and materials furnished as part of the Work of the Project.
7. Prepare and submit draft Facility O&M Data and the draft Electronic O&M Manual in accordance with the requirements of this Section.
8. Submit draft as-built BIM developed in accordance with Section 01340 Building Information Modeling Requirements and updated to include as-built conditions.
9. Submit training materials and recordings of training sessions as described in Section 01757 Commissioning.
10. Submit approved Acceptance Test Plan developed in accordance with Section 01757 Commissioning and with this Section.
11. Deliver tools, spare parts, extra material, and maintenance products in accordance with Section 01600 Product Delivery Storage and Handling.
12. Submit changeover information related to Owner's use, operation, and maintenance.
13. Prepare and submit draft Project Record Documents prepared in accordance with Section 01700 Execution Requirements and submitted in accordance with the requirements of this Section.

B. All Final Completion documents shall be submitted at least 14 calendar days prior to Final Completion inspection request. Before requesting a final inspection to determine the date of Final Completion, complete the following:
    1. Submit a certified copy of the City's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by the City. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
    2. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
    3. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Final operations and maintenance manuals must be provided for the training sessions.
    4. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects. Surfaces which cannot be touched-up or repaired satisfactorily, shall be refinished or replaced.
    5. Submit changeover information related to Owner's use, operation, and maintenance.
    6. Submit final O&M Data, including the final electronic O&M in accordance with the requirements of this Section.
    7. Submit Final Building Information Model incorporating all as-built information in accordance with Section 01340 Building Information Modeling Requirements.
    8. A written request for final inspection for acceptance requirements.
    9. Submit a final Application for Payment according to Division1 Section "Payment Procedures."

1.04 WARRANTIES

A. Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
B. Partial Use: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and used by Owner during construction period by separate agreement with Contractor or Design-Builder.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
    1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
    2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
    3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor or Design-Builder.
D. Provide additional copies of each warranty to include in operation and maintenance manuals.
E. Provide additional copies of each warranty as a separate pdf file.
F. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1.05 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining the date of Substantial Completion, the Contractor or Design-Builder shall comply with all conditions in Supplementary Conditions and complete the following. List items below that are incomplete in request.
    1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
    2. Deliver salvaged material and similar items in accordance with Section 01352 Selective Alterations and Demolition to location designated by the Owner. Label with manufacturer's name and model number where applicable.
    3. Complete Installation and Functional Testing of all equipment, systems and subsystems in accordance with Section 01757 – Commissioning.
    4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems in accordance with Section 01757 – Commissioning.
    5. Clean the project area of construction debris and other construction effects.
    6. Terminate and remove temporary facilities from the Project site, along with mockups, construction tools, and similar elements.
    7. Complete final cleaning requirements, including touchup painting.
    8. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
    9. Prepare and submit all required Submittals as specified herein.
B. Inspection: Submit a written request for Substantial Completion inspection. On receipt of request, the Engineer will either proceed with inspection or notify Contractor or Design-Builder of unfulfilled requirements. The Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor or Design-Builder of items, either on Contractor or Design-Builder's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.
    1. Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

2. Results of completed inspection will form the basis of requirements for Substantial Completion.
3. The Contractor or Design-Builder shall pay for any re-inspection other than the first re-inspection. The costs of all extra re-inspections, including the cost of the Owner's Representative and the Engineer will be deducted from the Contractor or Design-Builder's payments.
4. Following completion of all items above and all requirements for Substantial Completion included in the Supplemental Conditions 008000, the Owner will complete Form 01290.2 Certificate of Substantial Completion and distribute to the Contractor or Design-Builder.

1.06 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining the date of Final Completion, complete the following:
    1. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Final operations and maintenance manuals must be provided for the training sessions.
    2. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects. Surfaces which cannot be touched-up or repaired satisfactorily, shall be refinished or replaced.
    3. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects. Surfaces which cannot be touched-up or repaired satisfactorily, shall be refinished or replaced.
    4. Prepare and submit all required Submittals as specified herein.
B. A written request for final inspection for acceptance must be provided to the Engineer. Upon receipt of request, Engineer will either proceed with inspection or notify Contractor or Design-Builder of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor or Design-Builder of construction that must be completed or corrected before certificate will be issued.
    1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected. The Contractor or Design-Builder shall pay for any re-inspection other than the first re-inspection. The costs of all extra re-inspections, including the cost of the Owner's Representative and the Design Professional deducted from the Contractor or Design-Builder's payments.
    2. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."

1.07 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Contractor or Design-Builder shall prepare and submit three copies of punch list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor or Design-Builder that are outside the limits of construction. The Contractor or Design-Builder shall use the standard Water Services form for all items.
    1. Organize a list of spaces in sequential order,
    2. Organize items applying to each space by major element, including category equipment, and building systems.
    3. Include the following information at the top of each page:
        a. Project Number

b. Project name.
c. Date.
d. Name of Contractor or Design-Builder.
e. Page number.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with the manufacturer's written instructions.
C. Complete the following cleaning operations before requesting inspection for certification of Final Completion for entire Project or for a portion of Project:
    1. Clean Project site and grounds, in areas disturbed by construction activities, of rubbish, waste material, litter, and other foreign substances.
    2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    3. Remove tools, construction equipment, machinery, and surplus material from the Project site.
    4. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, and similar spaces.
    5. Sweep concrete floors broom clean in unoccupied spaces.
    6. Remove labels that are not permanent.
    7. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already shows evidence of repair or restoration.
D. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
    1. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
    2. Clean ducts and blowers if units were operated without filters during construction.
    3. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
    4. Leave Project clean and ready for use.
E. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the Project site and dispose of lawfully.

END OF SECTION

SECTION 01020 – RECORD DOCUMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Contractor shall maintain, in a safe place at the Site, one updated record copy of all Drawings, Standards and Specifications, Addenda, Shop Drawings, Requests for Interpretation (RFIs), Requests for Proposal (RFPs), Work Change Directives (WCDs), Change Orders, other written interpretations or clarifications of the contract documents, survey information (including approved cut sheets) and all other documents relevant to the Work.
B. All such documents shall be kept in order, good condition and shall be continuously updated to indicate all work installed and all changes made during construction.
C. No work shall be allowed in the absence of these record documents.
D. This document also outlines electronic data requirements and defines the survey requirements for the development of Field-Marked Drawings, As-Built Drawings and Conforming to Construction Drawings.

1.02 RELATED SECTIONS

A. Section DB 00700 – General Conditions (Design-Build Project Delivery)
B. Section DB 00800 – Supplementary Conditions (Design-Build Project Delivery)
C. Section 00700 – General Conditions (Design-Bid-Build Project Delivery)
D. Section 00800 – Supplementary Conditions (Design-Bid-Build Project Delivery)
E. Section 01015 – Specific Project Requirements.
F. Section 01019 – Closeout Procedures.
G. Section 01020 – Record Documents.
H. Section 01021 – Operation and Maintenance Data.
I. Section 01140 – Work Restrictions.
J. Section 01140.01 - Process and System Shutdown Constraints Schedule.
K. Section 01140.02 - Operation Change Control Plan Documents.
L. Section 01300 – Submittals.
M. Section 01320 – Construction Progress Documentation.
N. Section 01322 – Photogram Documentation.
O. Section 01335 – Document Management.
P. Section 01340 – Project BIM Coordination
Q. Section 01664 – Training.
R. Section 01757 – Commissioning.

1.03 CODES AND STANDARDS

A. CAD Standards – KC Water CAD Standards.

1.04 DEFINITIONS

A. Refer to Section 01420 – Definitions and Acronyms

1.05 INFORMATION PROVIDED BY THE CITY

A. The City will provide the Contractor or Design-Builder a border template to be used for all issued Construction Drawings in an electronic/CAD format.

1.06 SUBMITTALS

A. Submit as specified in Section 01300 – Submittals.
B. Warranties and Bonds.
C. For each item of material or equipment furnished under the Contract.
D. Submittals include, but are not limited to, the following:
    1. Warranties as specified herein.
    2. As-Built Drawings.
    3. Conforming to Construction Drawings.
    4. Electronic Submittals:
    5. All electronic deliverables (drawings, coordinates table, etc.) shall be made through the approved document management system. See Section 01335 – Document Management.
    6. As-Built Drawings:
        a. One (1) hard copy on paper for review and approval.
        b. One (1) electronic copy in PDF format.
        a. One (1) electronic copy in the latest version of AutoCAD® .dwg format.
    7. Conforming to Construction Drawings:
        a. One (1) signed, sealed and certified hard copy on Mylar or Vellum.
        b. One (1) signed, sealed and certified hard copy on paper.
        c. One (1) signed, sealed and certified electronic copy in PDF format.
        d. One (1) signed, sealed and certified electronic copy in the latest version of AutoCAD® .dwg format.
    8. All Record Documents including those listed in the referenced Sections:
        a. Submit Record documents in accordance with Section 00700 – General Conditions, Article 14 – Payments to the Contractor or Design-Builder and Completion.
        b. The following shall be submitted for Record Documents:
            i. One (1) hard copy on paper.
            ii. One (1) electronic copy in PDF format.
            iii. As specified in other sections.
            iv. Electronic (PDF) Documents:
            v. Documents shall be full scale.
            vi. Markups shall be noted in RED.
            vii. Minimum resolution shall be 600 dpi.

1.07 WARRANTY

A. Warranties and Bond are Record Documents.
B. CITY has the right to reject warranties.
C. CITY reserves the right to reject Work for the Project if the required warranties have not been provided.
D. Submit form of manufacturer's warranty prior to fabrication and shipment of the item from the manufacturer's facility.
E. Submit form of manufacturer's special warranty when specified.
F. Provide consolidated warranties and bonds within 15 calendar days of Substantial Completion.
G. Contents:
    1. Organize warranty and bond documents:

2. Include Table of Contents organized by specification section number and the name of the product or work item.
3. Include each required warranty and bond in proper form, with full information, are certified manufacturer as required, and are properly executed by Contractor, or subcontractor, supplier, or manufacturer.
4. Provide name, address, phone number, and point of contact of manufacturer, supplier, and installer, as applicable.

H. Warranty submittal format:
1. Submit two (2) hardcopies.
2. Hardcopies shall be assembled in 3 D-side ring binders with durable cover.
3. Identify each binder on the front and spine clearly labeling the following:
   a. Warranties and Bonds.
   b. Project Name or Title.
   c. Name, Address, and Telephone Number of the Contractor.
4. Submit one (1) electronic copy in PDF format.
5. The Record Documents shall be an integral part of the work guaranteed by the Contractor or Design-Builder's Performance and Maintenance Bond. If during the three-year maintenance period the City determines that further revisions or corrections are necessary to make the Record Documents accurate, the Contractor or Design-Builder shall make or cause the revisions or corrections to be made at no additional cost to the City.

1.08 QUALITY ASSURANCE

A. The Contractor or Design-Builder is responsible for the quality assurance and quality control of the Work.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION

3.01 SURVEY REQUIREMENTS

A. All field books, notes, videotapes and other data developed by the Contractor or Design-Builder in performing required surveys as part of the Work shall be available to the City for examination throughout the construction period. All such data shall be submitted to the City with the other documentation required for final acceptance of the Work.

B. General Requirements:
1. The Contractor or Design-Builder shall provide survey grade information for the locations and elevations of the Work as described herein. Surveys shall be conducted by a Professional Land Surveyor, licensed in the State of Missouri.
2. Vertical Datum – All elevations shall be indicated in North American Vertical Datum of 1988 (NAVD 88) in feet and decimals of a foot.
3. Horizontal Control – Coordinates shall be referenced to the North American Datum of 1983 (NAD 83), State Plane Missouri West Zone FIPS 2403 US Feet coordinate system, Kansas City Metro Control. Statewide Missouri Geographical Reference System monuments, Project monuments and Certified Land corners shall be used as references to determine State Plane

coordinates. All control monuments used in the survey work shall be listed with reference ties and shown on the Record Drawings.

4. Water Systems:
   a. Fire Hydrant Assemblies – Provide survey point (location and elevation) at the top of the operating nut for each fire hydrant.
   b. Fittings – Provide survey point (location and elevation) at the center of each fitting (i.e. bends, tees, valves, etc.). Survey shall be taken at the top of the fitting. Provide the elevation of finished grade or improvements at the top of the fitting.
   c. Pipe Profile – Provide survey points (location and elevation) at the center point of all piping at a maximum spacing of 50 feet. Survey shall be taken on the top of the pipe. At the same location, provide the elevation of finished grade.
   d. Valves, Valve Vaults, Meter pits and Other Structures – A survey is required to verify the location of all new valves, valve vaults, meter pits or other structures. The survey shall include, but is not limited to, the following:
      (i) Location of the Structure – Provide coordinates for the center of the access cover.
      (ii) Top elevation – Provide the top elevation of the structure at the center of the access cover.
5. Wastewater Systems:
   a. Location – Verify the "Locating Point" shown on the Approved for Construction Drawings or standard detail. Verify all coordinate data shown on the Approved for Construction Drawings. If no such information is provided, the Locating Point shall be the center of the manhole cover.
   b. Top Elevation. – Provide the elevation of the top of the structure at the Locating Point.
   c. Pipe Inverts – Provide the invert elevation and flow direction of all pipes that penetrate the structure (flowline in - FL IN) and exit the structure (flowline out - FL OUT).
   d. Manhole Invert – Provide the elevation of the invert at the center of the manhole if different than the pipe inverts.
6. Existing Manholes – A survey is required to verify the location of all existing manholes that are modified as part of the Work. The survey shall include, but is not limited to, the following:
   a. Location of the Structure – Verify the "Locating Point" shown on the Approved for Construction Drawings or standard detail. Verify all coordinate data shown on the Approved for Construction Drawings. If no such information is provided, the Location Point shall be the center of the manhole cover.
   b. Top Elevation – Provide the elevation of the top of the structure at the Locating Point.
   c. Pipe Inverts – Provide the invert elevation and flow direction of all pipes that penetrate the structure (flowline in - FL IN) and exit the structure (flowline out - FL OUT).
   d. Manhole Invert – Provide the elevation of the invert at the center of the manhole if different from the pipe inverts.
7. Storm Water and Green Infrastructure Systems
   a. A survey is required to verify the location of all new Green Infrastructure, Storm Water Structures, Junction Boxes, Manholes, Inlets and all other related structures. The survey shall include, but is not limited to, the following:
   b. Location of the Structure – Verify the Locating Point shown on the Approved for Construction Drawings or standard detail. Verify all coordinate data shown on the Approved for Construction Drawings. The locating point for curb inlets is center of inside face of inlet wall. If no other locating information is provided for other structures, the Locating Point shall be the center of the access cover.

c. Top Elevation – Provide the elevation of the top of the structure at the Locating Point.
d. Pipe Inverts – Provide the invert elevation and flow direction of all pipes that penetrate the structure (flowline in - FL IN) and exit the structure (flowline out - FL OUT).
e. Manhole or Structure Invert – Provide the elevation of the invert at the center of the manhole or structure if different than the pipe inverts.

8. Culvert - A survey is required to verify the location of new culverts. The survey shall include, but is not limited to, the following:
   a. Location – The Locating Points shall be the center line of each culvert barrel at the upstream and downstream end of each. The location of each culvert barrel is to be provided.
   b. Invert – Provide the upstream and downstream invert elevation of each culvert barrel.
9. Channels and Ditches:
   a. Profile – Provide survey points (location and elevation) at the upstream and downstream end of the channel and along the channel at a maximum 50-foot intervals and at all bends and changes in alignment.
   b. Survey points shall be taken at finished grade at the centerline, toes of side slopes or walls and top elevation of the high flow channel on both sides of the channel. If water is present in the channel or ditch, provide water surface elevation on both sides of the channel.
10. Detention Areas:
   a. For any surface feature designed to detain or retain storm water runoff (i.e., detention basins, rain gardens, bio-retention cells, etc.) an as-built survey of the feature is required.
   b. Enough survey points shall be taken to generate 1-foot contours of the detention or retention area and any containment berms.
   c. Provide survey points (location and elevation) for both ends of weirs, all weir high and low points (if top of weir is not level) and other flow control structures, inlets and outlets.
   d. Provide survey points (location and elevation) for both ends of weirs and all weir high and low points (if top of weir is not level) of the principle spillway structure.
11. Facility Site Assets:
   a. Site Assets shall be documented to the same level of detail as other assets (water, wastewater etc..).
   b. Assets include all buried infrastructure in the project including but not limited to ductbanks, conduit, chemical piping, casings, gravity sewers, process piping, etc.

3.02 FIELD-MARKED DRAWINGS

A. The Contractor or Design-Builder shall continuously maintain a set of Field-Marked Drawings which details all work completed and shows all changes or deviations made by the Contractor or Design-Builder from the Approved for Construction Drawings. Where the Approved for Construction Drawings are not detailed and allow for flexibility during construction, the Contractor or Design-Builder shall include the detailed information on how the Work was constructed. These adjustments shall include, but are not limited to, field adjustments and change orders.
B. Field-Marked Drawings shall be prepared using survey grade information to show the horizontal and vertical location of the Work after completion of construction. Connection details may be sketched using field run measurements.
C. Mark new information that is not shown on Drawings or Shop Drawings.

D. Include the following:
   a. Field changes of dimension and detail.
   b. Change Order modification. Note related Change Order numbers where applicable.

c. RFI modification. Note related RFI numbers where applicable.
d. Details not on original Drawings.
e. Horizontal and vertical location of all underground utilities and all other concealed elements that would be difficult or costly to maintain the installed asset long term.

E. Precision of Measurement:
a. Where survey measurements are not required (sketching connection details) – elevations, stationing, distances and measurements shall be expressed to the nearest 0.10 foot.
b. All other Work requires survey information – elevations, station, distances and measurements shall be expressed to the nearest 0.01 foot.
c. Field changes or additions shall be designated in RED. Hard copy and electronic (PDF) deliverables shall be provided in color.
d. Information shall be clearly distinguishable on hard copy mark-ups and in the electronic files.

F. If the Contractor or Design-Builder observes inaccurate information pertaining to existing conditions, the correct information shall be noted in the Field-Marked Drawings.

G. The Contractor or Design-Builder shall submit 30%, 60% and 90% check prints with the corresponding percent complete of work. The check prints shall be submitted with the Application for Payment. Failure to provide the check prints shall cause the Application for Payment to be returned to the Contractor or Design-Builder.

3.03 AS-BUILT DRAWINGS

A. Upon completion of the Work and before the Application for Final Payment, the Contractor or Design-Builder shall prepare the As-Built Drawings by completing annotations to the Field-Marked Drawings and adding the required certification statements.

B. Surveyor's Certification:
1. Each drawing shall be modified to include a certification statement and signature block as described below.
a. Water Systems

Each sheet of these Record Drawings and attached Survey Cut Sheets for the Work have been reviewed and approved by the Professional Land Surveyor whose seal is affixed to this Record. The horizontal control, coordinates and elevations shown on these Records are accurate and are based on the Missouri Coordinate System of 1983, West Zone and NAVD88 datum, with the date of adjustment. These Records have been revised, as required in Section 01000, 1.20 of the Standards and Specifications for Water Main Extensions and Relocations, under my personal supervision to show the true and accurate measurements of the work as it was actually constructed.

b. Wastewater, Storm Water and Green Infrastructure Systems

Each sheet of these Record Drawings, Record Models and attached Survey Cut Sheets for the Work have been reviewed and approved by the Professional Land Surveyor whose seal is affixed to this Record. The horizontal control coordinates and elevations shown on these Records are accurate and are based on the Missouri Coordinate System of 1983, West Zone and NAVD88 Datum. These Records have been revised under my personal supervision to show the true and accurate measurements of the work as it was actually constructed.

2. Every sheet of the Field-Marked Drawings must be reviewed, signed and sealed by a Professional Land Surveyor, licensed in the State of Missouri and must include the following statement on the title block inside the box marked “for WSD use” and near the Surveyor’s professional license seal.

C. Contractor’s Certification:
1. Each drawing shall be modified to include a certification statement and signature block as described below:

Water Systems

I hereby certify that this Record correctly depicts the Work constructed as to size, material, horizontal location, vertical location and finished grade as shown on the approved construction drawings or their revision. The Work was done in accordance with these Records and the current version of the Standards and Specifications for Water Main Extensions and Relocations.

Contractor: _____ *Date:* _____

Name (print): _____ *Title:* _____

Signature: _____

Wastewater, Storm Water and Green Infrastructure Systems

I hereby certify that this Record correctly depicts the Work constructed as to size, material, horizontal location, vertical location, grade of installed piping systems and finished grade as shown on the approved construction drawings or their revision. The Work was done in accordance with these Records.

Contractor: _____ *Date:* _____

Name (print): _____ *Title:* _____

Signature: _____

a. The Contractor or Design-Builder shall provide certification that the Field-Marked Drawings reflect the conditions that were constructed.
b. The Contractor or Design-Builder shall review the Field-Marked Drawings and verify all information is accurate. The Contractor or Design-Builder shall verify that all changes to the Work have been documented. The Contractor or Design-Builder shall sign each sheet of the Record Drawings with the following certification(s):

D. Submittals – Submit As-Built Drawings in accordance with paragraph SUBMITTALS. As-Built and Conforming to Construction Drawings must be approved by the City before the Contractor or Design-Builder submits the Application for Final Payment.
1. Mark each document "AS-BUILT DRAWINGS" in neat, large print letters.
2. The cover sheet of the project shall be included. The cover sheet shall include all required As-Built certifications and shall clearly show that the drawings are AS-BUILT.

3.05 RECORD MODEL

A. BIM model of the structure constructed or modified during this project.
B. Record Model should be per KC BIM standards with Record documents and drawings linked.

C. All BIM files and associated files shall be tagged according to Record File Standard.

3.06 CONFORMING TO CONSTRUCTION DRAWINGS AND MODEL

A. Conforming to Construction Drawings shall be submitted and accepted by the City before the Contractor or Design-Builder may submit the Application for Final Payment.
B. The Contractor or Design-Builder shall edit the CAD drawings to reflect the changes shown on the As-Built Drawings. All line work and text shall be revised and edited to accurately reflect the information provided in the As-Built Drawings. Line work shall be drawn to scale in the coordinate system and datum specified herein.
C. Version – CAD drawings shall be developed and submitted in the latest version of AutoCAD® .dwg format or AutoCAD® Civil 3D.
D. CAD Standards – Comply with KC Water CAD Standards.
E. GIS Standards – Comply with KC Water GIS Standards.
F. The cover sheet of the project shall be included. The cover sheet shall include all required as-built certifications and shall clearly show that the drawings are as-built.
G. Conforming to Construction Drawings shall have a "CONFORMED TO CONSTRUCTION" label clearly and prominently shown on each sheet, preferably in the lower right-hand corner of the drawing.
H. Conforming to Construction Drawings shall be labeled with the following information:
    1. Project Name.
    2. WSD Project Number.
    3. WSD Work Order Number.
    4. WSD Drawing Number.
    5. CMMS Assets.
    6. Date of publication.

3.07 OTHER RECORD DOCUMENTS

A. As defined by Section 00700 – General Conditions, Article 6 – Contractor or Design-Builder's Responsibilities. Section 01021 – Operation and Maintenance Data, Section 01300 –Submittals, Section 01320 – Construction Progress Documentation, Section 01322 – Photographic Documentation, Section 01664 – Training, Section 01757 – Commissioning, etc…
B. GIS Data of Site Piping.
C. Coordinates Table – Provide a Microsoft Excel spreadsheet that contains the coordinates of every asset installed or adjusted as part of the Work.
D. Survey Cut Sheets.
E. Television Inspection data files as specified in Section 02686 – CCTV Inspection.

END OF SECTION

SECTION 01021 – OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for the preparation, submission, and City's Representative's review of Operation and Maintenance (O&M) Data.

1. The Contractor shall furnish all labor, materials, equipment, and incidentals as necessary to comply with these requirements.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract; including General and Supplementary Conditions, all applicable Division 1 Sections, and all applicable Division Sections; apply to this Section.

B. Related Sections include the following:

1. Section 01000 – General Project Requirements
2. Section 01015 – Specific Project Requirements
3. Section 01019 – Closeout Procedures
4. Section 01020 – Record Documents
5. Section 01140 – Work Restrictions
6. Section 01140.01 - Process and System Shutdown Constraints Schedule
7. Section 01140.02 - Operation Change Control Plan Documents
8. Section 01020 – Record Documents
9. Section 01300 –Submittals
10. Section 01320 – Construction Progress Documentation
11. Section 01322 – Photogram Documentation
12. Section 01335 – Document Management
13. Section 01664 – Training
14. Section 01757 – Commissioning

1.03 REQUIRMENTS

A. Contractor shall prepare and provide data and materials, and provide instruction and services, as specified in this Section.

B. Compile product data and related information appropriate for Owner's maintenance and operation of products and systems furnished under this Contract. Include Information on all motors supplied with equipment.

C. Prepare O&M Data as specified in this Section and as referenced in other pertinent sections of the Specifications.

D. Instruct Owner's personnel in maintenance of products and in operation of equipment and systems, including electrical and instrumentation.

1.04 DEFINITIONS

A. O&M Data is including but not limited to:

1. Original Equipment Manufacturer Operation and Maintenance manuals.

2. Electronic O&M Manual for the entire project.
3. PLC, VFD, and SCADA Server Programs.

B. Preliminary Data: Initial and subsequent submissions for the City's Representative's review.

C. Final Data: City's Representative accepted data, submitted as specified herein.

D. Maintenance Operation: As used on Asset Maintenance Summary Form is defined to mean any routine operation required to ensure satisfactory performance and longevity of equipment. Examples of typical maintenance operations are lubrication, belt tensioning, adjustment of pump packing glands, and routine adjustments.

1.05 SUBMITTALS

A. Informational:

1. Data Outline: Submit two copies of a detailed outline of proposed organization and contents of Final Data prior to the preparation of the Preliminary Data.

2. Preliminary Data:
   a. Submit three copies for City's Representative's review including Relevant Standard Operation Procedures and Standard Instructions.
   b. If Data meets the condition of the Contract:
      (1) One copy will be returned to Contractor.
      (2) One copy will be forwarded to Resident Project Representative.
      (3) One copy will be retained in City's Representative's file.
   c. If Data does not meet the condition of the Contract:
      (1) All copies will be returned to Contractor with City's Representative's comments (on separate document) for revision.
      (2) City's Representatives comments will be retained in City's Representative's file.
      (3) Resubmit two copies revised in accordance with City's Representative's comments.

1.06 SEQUENCING AND SCHEDULING

A. Equipment and System Data:

1. Preliminary Data:
   a. Do not submit until Shop Drawings for equipment or system has been reviewed and approved by City's Representative.
   b. Submit prior to shipment.

2. Final Data: Submit instructional Manual Formatted data not less than 30 days prior to equipment or system field functional testing Submit Compilation Formatted and Electronic Media Formatted data prior to Substantial Completion of Project.

B. Materials and Finish Data:

1. Preliminary Data: Submit at least 15 days prior to request for final inspection.

2. Final Data: Submit within 10 calendar days after final inspection.

PART 2 - PRODUCTS

2.01 DATA FORMAT (for Original Equipment Manufacture Operations and Maintenance Manuals OEM O&Ms)

A. Prepare preliminary and final data in the form of an instructional manual. Prepare final data on electronic media and printed.

B. Instructional Manual Format:

1. Binder: Commercial quality, permanent, three ring or three post binder with durable plastic cover.

2. Size: 8 ½ inches by 11 inches minimum.

3. Cover: Identify manual with typed or printed title, "(relevant area) OPERATION AND MAINTENANCE MANUAL" and list.
   a. Project title.
   b. Designate applicable system, equipment, material, or finish.
   c. Identify the assets covered in this O&M Manual.
   d. Identify separate structure as applicable.
   e. Identify volume number if more than one volume.
   f. Identify of general subject matter covered in manual. Identity of equipment number and Specification section.

4. Spine:
   a. Project Title.
   b. Volume number (if more than one volume).

5. Title Page:
   a. Contractor name, address, and telephone number.
   b. Subcontractor, supplier, installer, or maintenance Contractor or Design-Builder's name, address, and telephone number, as appropriate.
      (1) Identify area of responsibility of each.
      (2) Provide name and telephone number of local source of supply of parts and replacement.

6. Table of Contents:
   a. Neatly typewritten and arranged in systematic order with consecutive page numbers.
   b. Identify each product by product name and other identifying numbers or symbols as set forth in Contract Documents.

7. Paper: 20 pound minimum, white for typed pages.

8. Text: Manufacturer's printed data, or neatly typewritten.

9. Three-hole punch data for binding and composition.

10. Material shall be suitable for reproduction, with quality equal to original. Photocopying of material will be acceptable, except for material containing photographs.

C. Data Compilation Format:

1. Compile all City's Representative's accepted preliminary O&M data into a hard copy, hard bound set.

2. Each set shall consist of the following:

a. Binder: Commercial quality, permanent, three ring or three post binders with durable plastic covers.
b. Cover: Identify each volume with typed and printed title "OPERATION AND MAINTENANCE DATA, VOLUME NO. _____ OF _____", and list:
   (1) Project Title
   (2) Contractor's name, address, and telephone number.
   (3) If entire volume covers equipment or system provided by one supplier include the following:
      (a) Identity of general subject matter covered in manual.
      (b) Identity of equipment number and Specification section.
c. Provide each volume with title page and typed table of contents with consecutive page numbers. Place contents of entire set, identified by volume number, in each binder.
d. Table of contents neatly typewritten, arranged in a systematic order:
   (1) Include list of each product, indexed to content of each volume.
   (2) Designate system or equipment for which it is intended.
   (3) Identify each product by product name and other identifying numbers or symbols as set forth in Contract Documents.
e. Section Dividers:
   (1) Heavy, 80 pound cover weight, tabbed with numbered plastic index tabs.
   (2) Fly leaf:
      (a) For each separate product, or each piece of operating equipment, with typed description of product and major component parts of equipment.
      (b) List with each product:
         (i) Name, address, and telephone number of Sub-contractor, Supplier, Installer, and Maintenance Contractor or Design-Builder, as appropriate.
         (ii) Identify area of responsibility of each.
         (iii) Provide local source of supply for parts and replacement.
f. Assemble and bind material, as much as possible, in same order as specified in the Contract Documents.

D. Electronic Media Data:

1. Portable Document Format (PDF):
   a. After all preliminary data has been found to be acceptable to City's Representative, submit Operation and Maintenance data in PDF format on CD.
   b. Files to be exact duplicates of City's Representative's accepted preliminary data. Arrange by specification number, asset, and name.
   c. Files to be fully functional and viewable in most recent version of Adobe Acrobat.
   d. PDFs shall be bookmarked as appropriate with appropriate hyperlinks.
   e. All files shall be tagged per the City's Record File tagging system.

E. DATA FOR EQUIPMENT SYSTEMS (Original Equipment Manufacturer Operations and Maintenance Manuals OEM O&Ms):

1. Content for each Unit (or Common Units) and System:

2. Product Data:
   a. Include only those sheets that are pertinent to specific product.
   b. Clearly annotate each sheet to:

(1) Identify specific product or part installed.
(2) Identify data applicable to installation.
(3) Delete references to inapplicable information.

c. Function, normal operating characteristics, and limiting conditions.
d. Performance curves, engineering data, nameplate data, and tests.
e. Complete nomenclature and commercial number of replaceable parts.
f. Original manufacturer's parts list, illustrations, detailed assembly drawings showing each part with part numbers and sequentially numbered parts list, and diagrams required for maintenance.
g. Spare parts ordering instructions.
h. Where applicable, identify installed spares and other provisions for future work (e.g., reserved panel space, unused components, wiring, terminals).

3. As installed, color coded piping diagrams.

4. Charts of valve tag numbers, with the location and function of each valve.

5. Drawings: Supplement product data with drawings as necessary to clearly illustrate:
   a. Format:
      (1) Provide reinforced, punched, binder tab; bind in with text.
      (2) Reduced to 8 ½ inches by 11 inches, or 11 inches by 17 inches folded to 8 ½ inches by 11 inches.
      (3) Where reduction is impractical, fold and place in 8 ½ inch by 11 inch envelopes bound in text.
      (4) Identify Specification section and product on drawings and envelopes.
   b. Relations of component parts of equipment and systems.
   c. Control and flow diagrams.
   d. Coordinate drawings with Project record documents to assure correct illustration of completed installation.

6. Instructions and procedures: Within text, as required to supplement product data.
   a. Format:
      (1) Organize in consistent format under separate heading for each different procedure.
      (2) Provide logical sequence of instructions for each procedure.
      (3) Provide information sheet for Owner's personnel, including:
         (a) Proper procedures in event of failure.
         (b) Instances that might affect validity of guarantee or Bond.
   b. Installation Instructions: Including alignment, adjusting, calibrating, and checking.
   c. Operating Procedures:
      (1) Startup, break-in, routine, and normal operating instructions.
      (2) Test procedures and results of factory tests where required.
      (3) Regulation, control, stopping, and emergency instructions.
      (4) Description of operation sequence by control manufacturer.
      (5) Shutdown instructions for both short and extended duration.
      (6) Summer and winter operating instructions, as applicable.
      (7) Safety precautions.
      (8) Special operating instructions.
   d. Maintenance and Overhaul Procedure:

(1) Routine maintenance.
(2) Guide to troubleshooting.
(3) Disassembly, removal, repair, reinstallation, and re-assembly.
(4) Recommended work orders for preventative maintenance.

7. Guarantee, Bond, and Service Agreement: In accordance with section 01770, "Closeout Procedures".

8. Standard Operating Procedures and Standard Instructions for each unit process in KCMO Water Services Format approved by the KCMO City's Representative and Utility and created by the engineer of record or an alternative acceptable to the KCMO City's Representative.

9. Assets covered in this document.

F. Content for each Electric or Electronic Item or System:

1. Description of Unit and Component Parts:
   a. Function, normal operating characteristics, and limiting conditions.
   b. Performance curves, engineering data, nameplate data, and tests.
   c. Complete nomenclature and commercial number of replaceable parts.
   d. Interconnection wiring diagrams, including control and lighting systems.
   e. Piping and Instrumentation Diagram of the unit.

2. Circuit Directories of Panelboards.

3. Electrical service.

4. Control requirements and interface.

5. Communication requirements and interfaces.

6. List of electrical relay settings, and control and alarm contact settings.

7. Electrical interconnection wiring diagram, including as applicable, single line, three line, schematic and internal wiring, tags per KCMO tagging standard and external interconnection wiring.

8. As installed control diagrams by control manufacturer.

9. Operating Procedures:
   a. Routine and normal operating instructions.
   b. Startup and shutdown sequences, normal, and emergency.
   c. Safety precautions.
   d. Special operating instructions.

10. Maintenance Procedures:
    a. Routine maintenance.
    b. Guide to troubleshooting.
    c. Adjustment and checking.
    d. List of relay settings, control, and alarm contact settings.
    e. Preventative Maintenance.

11. Manufacturer's printed operating and maintenance instructions.

12. List or original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

G. Maintenance Summary:

1. Complete individual Maintenance Summary for each applicable equipment item, respective unit or system, and for components or sub-units.

2. The Maintenance Summary form shall be updated to incorporate the final recommendations established through the Maintenance Workshops described in Section 01320 Construction Progress Documentation.

3. Format:
   a. Use Maintenance Summary Form bound with this section or electronic facsimile of such.
   b. Each Maintenance Summary may take as many pages as required.
   c. Use only 8 ½ inch by 11 inch size paper.
   d. Complete using typewritten or electronic printing.

4. Include detailed lubrication instructions and diagrams showing points to be greased or oiled; recommended type, grade, and temperature range of lubricants and frequency of lubrication.

5. Recommended Spare Parts:
   a. Data to be consistent with manufacturer's Bill of Materials/Parts List furnished in O&M manuals.
   b. "Unit" is the unit of measure for ordering the part.
   c. "Quantity" is the number of units recommended.
   d. "Unit Cost" is the current purchase price.

H. The type and quantity of spare parts provided shall be consistent with Criticality Workshops and failure mode and effects analysis (FMEA) process FMEA process as described in Section 01320 Construction Progress Documentation.

2.02 DATA FOR MATERIALS AND FINISHES

A. Content for Architectural Products, Applied Materials, and Finishes:

1. Manufacturer's data, giving full information on products:
   a. Catalog number, size, and composition.
   b. Color and texture designations.
   c. Information required for reordering special manufactured products.
2. Instructions for Care and Maintenance:
   a. Manufacturer's recommendation for types of cleaning agents and methods.
   b. Cautions against cleaning agents and methods that are detrimental to product.
   c. Recommended schedule for cleaning and maintenance.

B. Content for Moisture and Weather Exposed Products:

1. Manufacturer's data, giving full information on products:
   a. Applicable standards.
   b. Chemical composition.
   c. Details of installation.
2. Instructions for inspection, maintenance, and repair.

2.03 ELECTRONIC O&M MANUAL (E-O&M)

A. Contractor or Design-Builder shall provide a project specific Electronic O&M manual (e-O&M), which shall supplement the OEM O&M described. E-O&M shall contain the following information and functionalities:

1. Images (Photographic or digitally rendered) of the facility shall be provided in a "main screen" location, with specific facilities and systems labeled with all relevant names including but not limited to common names, CMMS tag and P&ID tags.
2. Overall and Major system descriptions as provided in the O&M manual.
3. Control Narratives for the overall project and individual systems/subsystems.
4. SOPs and SIs created by the Engineer of Record.
5. Record Photographs providing a document of the construction progress, as well as buried/hidden piping, conduits, foundations, and other infrastructure not readily located after construction work at the facilities is complete.
6. Manufacturer's shop drawings and O&M documents.
7. BIM of the assets.
8. Arc Flash Study.
9. Load Study.
10. Testing Results as identified in other Sections.
11. GIS records for the project.
12. As-Constructed/Record drawings and BIM of the completed facility.
13. Final Submittals for all project components.
14. Video recorded training organized by asset.
15. All system-specific information shall be organized into accessible files tied to each system. Access shall be through a written and/or graphic interface at the main screen.

B. All files submitted as part of the E-O&M shall be tagged per the Record File Standard.

C. PDF shall be bookmarked and hyperlinked.

D. E-O&M will operate through adobe acrobat software unless Contractor or Design-Builder provides an alternative application that is accepted in writing by the City of Kansas City, MO.

E. A draft version of the e-O&M will be provided to the city for review and comment at approximately 70% completion of the facility.

F. E-O&M will be installed at/on the project facility server or workstation(s) as appropriate, and a copy will be provided to the CITY.

G. Contractor will provide training on the use and update of the e-O&M to CITY. One training session lasting no longer than two (2) hours will be provided at the project location, Water Services offices, or Contractor or Design-Builders officers, as agreed-upon by the CITY.

H. All source files to the electronic O&M manual will be linked to the as-built BIM model by relevant asset, Items relevant to multiple assets will have multiple links.

I. Complete a short-circuit device coordination and arc flash study computer model developed in SKM.

J. Update SKM load study provided by the Owner.

K. Complete Asset/CMMS data:

1. Owner will provide a template for machine reading assets and maintenance activities into the Owner's Computerized Maintenance Management System (CMMS).

2. Access database template will be blank with fields for assets information such as asset additions, asset updates, asset retirements including a rough estimated value, maintenance activities for the assets, PID tags within the asset, and asset categorization.

3. Contractor or Design-Builder shall fill out the template documenting changes in the CMMS; insert asset additions including value, updates and retired assets including estimated value when taken out of service; work order updates; new PMs; PMs to be retired; non-destructive testing updates; and other asset fields. Assets shall be coordinated and categorized with the applicable CMMS takes for entry into Owner's CMMS and Financial Software.

2.04 PROGRAMS

A. PLC, VFD, and SCADA Programs: Provide current native format copies of all software programs used to control assets.

1. Files should be named per asset equipment IDs, systems, or sub systems as appropriate.

2.05 SUPPLEMENTS

A. The supplements listed below, following "End of Section", are part of this Specification.

1. Forms: Asset Maintenance Summary Form.

PART 3 - EXECUTION (NOT USED)

END OF SECTION

ASSET MAINTENANCE SUMMARY FORM

PROJECT _____ CONTRACT NO _____

KCMO CMMS TAG _____

EQUIPMENT ITEM _____

MANUFACTURER _____

PID/TAG NUMBERS _____

WEIGHT OF INDIVIDUAL COMPONENTS (OVER 100 POUNDS) _____

NAMEPLATE DATA (hp, voltage, speed, etc.) _____

MANUFACTURER'S LOCAL REPRESENTATIVE _____

Name _____ Telephone Number _____

Address _____

MAINTENANCE REQUIREMENTS

Maintenance Operation Comments	Frequency	Lubricant (if applicable)
List briefly each maintenance operation required and refer to specific information in manufacturer's standard maintenance manual, if applicable. (Reference to manufacturer's catalog or sales literature is not acceptable)	List required frequency of each maintenance operation	Refer by symbol to lubricant required

LUBRICANTS

Reference Symbol	Shell	Exxon Mobil	Chevron Texaco	BP Amoco	or Equal

RECOMMENDED SPARE PARTS FOR OWNER'S INVENTORY

Part Number	Description	Unit	Quantity	Unit Cost
Note: Identify parts provided by this contract with two asterisks				

SECTION 01110
SUMMARY OF WORK

PART 1 GENERAL

1.01 LOCATION OF WORK

A. The work of this Contract is located at Briarcliff WTP at 1 NW Briarcliff Road Kansas City, MO, 64116.

1.02 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required to construct the House Service Main Project in its entirety as shown on the Drawings and as specified herein for a fully functioning system.

B. The Work includes, but is not necessarily limited to, the following:

1. Inspection of Direct Buried House Service Main segments between settling basins and chemical building.

2. Demolition and removal of existing facilities as indicated and necessary for the construction of the project, including concrete penetrations, pipe racks, pipe supports, and out-of-service or abandoned piping as indicated for replacement.

3. Pipe Condition Assessment of direct buried House Service Main. Any faulty segments identified from the Pipe Condition Assessment shall be repaired and or replaced.

4. Construction of new House Service Main pipe located in pipe galleries throughout the Water Treatment Plan including pipe, fittings, valves, and other piping specialty items as indicated.

5. Construction of new hydrants/standpipe assemblies supplied by the House Service Main in the pipe gallery.

6. Repair of Concrete found to be in non-sufficient structural condition for environmental-engineering structures and/or in need of re-surfacing.

1.03 WORK SEQUENCE

A. Perform Work in sequence as indicated in the contract documents to ensure completion of the Work in the Contract Time. Completion dates of the various stages shall be in accordance with the approved construction schedule submitted by the Contractor.

1.04 CONTRACTOR'S USE OF PREMISES

A. Contractor shall limit the use of the premises for his/her Work and for storage to allow for:

1. Work by other agencies.

2. Owner occupancy.

3. Public use.

B. Coordinate use of premises with Owner.

C. Contractor shall assume full responsibility for security of all his/her and his/her subcontractors materials and equipment stored on the site.

D. If directed by the Owner, move any stored items which interfere with operations of Owner or other contractors.

E. Obtain and pay for use of additional storage or work areas if needed to perform the Work.

1.05 OWNER OCCUPANCY

A. Owner will occupy premises during performance of the work for the conduct of his/her normal operations. Coordinate all construction operations with Owner to minimize conflict and to facilitate Owner usage.

1.06 CONSTRUCTION COORDINATION

A. Activities by Others which may affect performance of the Work:

1. CITY will use an existing IDIQ contract for relocation of the Instrumentation and Control Wiring located in pipe galleries.

B. Contractor shall coordinate with the Owner regarding scheduling and sequence of work.

END OF SECTION

SECTION 01140 – WORK RESTRICTIONS

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes: Requirements for sequencing and scheduling the Work affected by existing site and facility; work restrictions; and coordination between construction operations and plant operations.

1.02 SUBMITTALS

A. Baseline Schedule with OCCP tasks.
B. Operational Change Control Plan (OCCP) Form.
C. Progress Schedule with OCCP tasks.

1.03 GENERAL CONSTRAINTS ON SEQUENCE AND SCHEDULING OF WORK

A. Water projects:
    1. The Briarcliff Water Treatment Plant is the City's only plant providing drinking water for ratepayers. Impairing operational capabilities of this treatment plant will result in serious environmental damage and monetary fines.
    2. Conduct Work in a manner that will not impair the operational capabilities of essential elements of the treatment process or reduce the capacity of the entire treatment plant below levels sufficient to treat to drinking water quality standards.
    3. Conduct commissioning and process start-up activities as specified in Section 01757 - Commissioning in a manner that will not impair the operational capabilities of essential elements of the treatment process or reduce the capacity of the entire treatment plant below levels sufficient to service process equipment, hydrants, or administration building plumbing.
    4. The status of the treatment plant shall be defined as "operational" when it is capable of treating the entire quantity of house service water can flow through pipe replaced.
B. Work sequence and constraints:
    1. Utilize description of critical events in work sequence in this Section as a guideline for scheduling and undertaking the Work.
    2. Work sequence and constraints presented do not include all items affecting completion of the Work, but are intended to describe critical events necessary to minimize disruption of the existing facilities and to ensure compliance with National Pollutant Discharge Elimination System (NPDES) permit requirements.
C. Instrumentation and controls process performance testing:
    1. After the Process Operational Period, test PCIS system as specified in Section 01757 - Commissioning.

1.04 SHUTDOWN AND CONSTRUCTION CONSTRAINTS

A. Normal working hours:
    1. Construction will take place during normal working hours as defined:
        a. 7AM to 3PM Monday through Friday.
        b. Refer to Section 00700 General Conditions Section 6.03 for further restriction if project is Design-Bid-Build.

c. Refer to Section DB 00700 General Conditions for further restrictions if project is Design-Build.

B. General shutdown constraints:
   1. Execute the Work while the existing facility is in operation.
   2. Some activities may be accomplished without a shutdown.
   3. Apply to activities of construction regardless of process or work area.
   4. Activities that disrupt plant or utilities operations must comply with these shutdown constraints.
   5. Organize work to be completed in a minimum number of shutdowns.
   6. Provide thorough advanced planning, including having required equipment, materials, and labor on hand at time of shutdown.
   7. Notify the City at least 30 days in advance of any tasks that will require dewatering and cleaning to allow the City the appropriate amount of time to conduct the work.
   8. Where required to minimize treatment process interruptions while complying with specified sequencing constraints, provide temporary pumping, power, lighting, controls, instrumentation, and safety devices.
   9. Final determination of the permitting of shutdowns will be the sole judgment of the Owner.
   10. Owner maintains the ability to abort on the day of the scheduled shutdown or to hold at any hold point.

C. General maximum plant flow work limitations:
   1. For any work between the months of April through November, Contractor shall request the maximum flow from Briarcliff Plant Operations in which disruptions due to construction activity are prohibited, or specified in 01140.01 Process and System Shutdown Constraints Schedule:

D. Unit process availability work limitations:
   1. Shutdowns and tie-ins or other activities that disrupt plant operations shall not occur if the following conditions exist unless approved by the OWNER in writing, or specified in 01140.01 Process and System Shutdown Constraints Schedule:
      a. Unexpected break in house service elsewhere within the Water Treatment plant.

E. Shutdown activities:
   1. Scheduling:
      a. Perform between the hours of 10 p.m and 4 a.m. unless otherwise specified herein or as approved by Owner.
   2. Unplanned shutdowns due to emergencies are not defined in this Section.

F. Dewatering of existing process and disposal of residue:
   1. When the Owner has turned the process unit over to the Contractor for modification or temporary use, the Contractor is responsible for costs and procedures required to dewater and dispose of liquid, solids, etc. in the process unit unless the Owner has made prior arrangements.
      a. Drainage and disposal of process unit liquids, solids, etc. into another treatment process unit on the plant site may be allowed if approved in advance by the Engineer and Owner and is conducted in accordance with the Project requirements.
      b. Costs for dewatering, disposal of solids and residuals, and preparation of surfaces for the Work are Contractor's responsibility.
         (1) Includes tipping fees for the removal and disposal of the grit/debris.
      c. Dewatering of grit/debris to meet landfill requirements is the responsibility of the Contractor.

d. Contractor shall provide adequate time in schedules for draining and cleanup of basins and channels.

G. Refer to the Process and System Shutdown Constraints Schedule in Section 01140.01 for additional requirements.

1.05 OPERATIONAL CHANGE CONTROL PLAN (OCCP)

A. Refer to Section 01140.02 - Operational Change Control Plan (OCCP) Documents for additional requirements.
B. Submit Baseline Schedule, as specified in Section 01320 – Construction Progress Documentation.
C. No consideration will be given to claims of additional time and cost associated to preparing OCCPs required by the Owner and Engineer to complete this work in a manner that facilitates proper operation of the facility and compliance with effluent discharge criteria.
D. Where required to minimize treatment process interruptions while complying with specified sequencing constraints, provide temporary pumping, power, lighting, controls, instrumentation, and safety devices.
E. OCCPs are required whenever an existing asset or a new asset that could affect treatment or conveyance are modified including but not limited to set points and operational modes.

1.06 COMPLIANCE WITH NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT

A. The existing facility is operating under the terms of a Drinking Water Permit issued by the State of Missouri. This permit specifies the applicable portions of the Safe Drinking water Act, Missouri Safe Drinking Water Law and Regulations and the Revised Statues of Missouri required for dispensing drinking water. A copy of the existing permit (Missouri State Permit to Dispense No. MO-1010415) is on file for review at the Administration Building at the Briarcliff .
B. Perform work in a manner that will not prevent the existing facility from achieving the finished water quality requirements established by regulations.
C. Bear the cost of penalties imposed on the Owner for discharge violations caused by actions of the Contractor.

1.07 REQUIREMENTS FOR OPERATION OF PLANT AND MAINTAINING CONTINIOUS OPERATION OF EXISTING FACILITIES

A. Facilities or conditions required to keep the existing plant operational include, but are not limited to, the following:
    1. Electrical power including transformers, distribution wiring, and motor control centers.
    2. Pumping and piping for conveyance of water, chemicals, and utilities between treatment units and pump stations.
    3. Chemical storage, metering, conveyance, and control facilities
    4. Provided with existing chemical storage tanks; chemical metering pumps and associated equipment; chlorine and ammonia residual analyzers; and chemical solution piping at various locations in the plant.
    5. Continuous addition of disinfection chemicals required during plant operations.
    6. All basins.
    7. Laboratory facilities.
    8. Office, toilets, and washrooms.
    9. Fencing and gates.

10. Lighting.
11. Heating, ventilation, and air conditioning.
12. Instrumentation, meters, controls, and telemetry equipment.
13. Safety equipment and features.
14. Parking for City employees and vehicles required for operation and maintenance of the treatment facilities.
15. Telephone system.
16. Storm drainage.
17. Natural gas service.
18. At least one flow path of House Water Service between the Pump Station and the administration/chemical building.

B. Contractor shall protect existing grating with steel traffic plate or other Engineer approved means when moving equipment or supplies over grating.
C. Maximum allowable superimposed live load on any existing grating or walkway shall be 50 psf. If higher loads are proposed, provide detailed calculations demonstrating adequacy of grating or walkway system for higher loads. The calculations shall be sealed and signed by a registered professional engineer and submitted to the Engineer for review and acceptance.

1.08 OPERATION AND MAINTENANCE ACCESS

A. Provide safe, continuous access to process control equipment for plant operations personnel.

1.09 COORDINATION OF THE WORK

A. Maintain overall coordination of the Work.
B. Obtain construction schedules from subcontractors and suppliers and assume responsibility for correctness.
C. Incorporate schedules from subcontractors and suppliers into Progress Schedule to plan for and comply with sequencing constraints.

1.10 WORK BY OTHERS

A. Where proper execution of the Work depends upon work by others, inspect and promptly report discrepancies and defects.

1.11 UTILITIES

A. Provide advance notice to request and utilize services of the Missouri One Call System (www.mo1call.com or 1-800-344-7483 (DIG-RITE)) for location and marking of underground utilities operated by utility agencies other than the Owner.
B. Maintain electrical, telephone, water, gas, sanitary facilities, and other utilities within existing facilities in service. Provide temporary utilities when necessary.
C. New yard utilities were designed using existing facility drawings.
    1. Field verification of utilities locations was not performed during design.
    2. Services crossed or located nearby new yard utilities may require relocation and possible shutdowns.

1.12 WORK CONSTRAINTS

A. Refer to Section 01140.01 – Process and System Shutdown Constraints Schedule.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 PROCESS AND SYSTEM SHUTDOWN CONSTRAINTS SCHEDULE

A. Refer to the Process and System Shutdown Constraints Schedule in Section 01140.01 for constraints on process and system shutdowns.
B. Requests for variance from any part of this schedule must be approved in writing by the OWNER.
C. The planned date of shutdown as listed on the Operational Change Control Plan (OCCP) form shall be considered the start date for the shutdown and used for calculating the actual shutdown duration, unless approved in writing by the OWNER. In the event that the OWNER can shut down a system or process prior to the planned date of shutdown and the CONTRACTOR agrees to commence work at that earlier date, the date that the CONTRACTOR commences work on the associated process or system shall be considered the start date for the shutdown and for calculating the actual shutdown duration.
D. These constraints are intended to supplement the demolition, modification, tie-in, and construction activities and constraints described in Article 1.12 of this Section.

End of Section

01140.01 - PROCESS AND SYSTEM SHUTDOWN CONSTRAINTS SCHEDULE

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: Information on the shutdown constraints for each of the major processes.

1.02 DEFINITIONS

A. Maximum Shutdown Duration: The maximum allowable time in calendar days (unless otherwise noted) that a process and its associated piping, valves, channels, gates, etc. may be removed from service to perform the required work on that process.

B. Minimum Time Between Shutdowns: The minimum amount of time in calendar days (unless otherwise noted) between consecutive shutdowns of a process and its associated piping, valves, channels, gates, etc. 3.

C. Maximum Number of Shutdowns: The maximum number of times that a process and its associated piping, valves, channels, gates, etc. may be removed from service to perform the required work on that process. In cases where only one (1) shutdown is allowed, a value has been listed in the "Minimum Time Between Shutdowns" column to provide guidance if additional shutdowns are determined to be required.

D. Seasonal Shutdown Constraint: The approximate time period during which a process shall remain in service and no work shall be performed on that process.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 PROCESS AND SYSTEM SHUTDOWN CONSTRAINTS SCHEDULE

A. The Process and System Shutdown Constraints Schedule is presented on the following pages.

B. Requests for variance from any part of this schedule must be approved in writing by the OWNER.

C. The planned date of shutdown as listed on the Operational Change Control Plan (OCCP) form shall be considered the start date for the shutdown and used for calculating the actual shutdown duration, unless approved in writing by the OWNER. In the event the OWNER can shut down a system or process prior to the planned date of shutdown and the CONTRACTOR agrees to commence work at that earlier date, the date that the CONTRACTOR commences work on the associated process or system shall be considered the start date for the shutdown and for calculating the actual shutdown duration.

D. These constraints are intended to supplement the demolition, modification, tie-in, and construction activities and constraints described in Section 01140 - Work Restrictions.

PROCESS AND SYSTEM SHUTDOWN CONSTRAINTS SCHEDULE					
	Maximum Shutdown Duration	**Minimum Time Between Shutdowns**	**Maximum Number of Shutdowns**	**Seasonal Shutdown Constraints**	**Notes**
Pipe Gallery between Secondary Settling Basins 1/2 & Final Settling Basins 1/2					
House Service Water (8” NPS)	8 hours Note 2	NA	NC	April - November	1, 2
Natural Gas (4” NPS)	4 hours	NC	NC	Rolling 3-day average Ambient Temperatures at or below 40°F	
Chlorine Solution (O.O.S.)	NA	NA	NA	NC	
Chlorine Solution Return (O.O.S.)	NA	NA	NA	NC	
Ammonia (1/2” NPS O.O.S.)	NA	NA	NA	NC	
Electrical Conduit	6 hours	NA	NA	NC	3
Final Settling Basin 3 – Pipe Galleries					
West of Basin – House Service Water	8 hours Note 2	NA	NC	April - November	1, 2

East of Basin– House Service Water	8 hours Note 2	NA	NC	April - November	1, 2
North of Basin – House Service Water	8 hours Note 2	NA	NC	April - November	1, 2
South of Basin – House Service Water	8 hours Note 2	NA	NC	April - November	1, 2
Other Shutdowns					
Other Piping Not Listed (each service)	4 hours	NA	2	NC	

General Notes:

(1) NC = No Constraints

(2) NA = Not Applicable

Notes:

(1) Shutdown of this process, system, or equipment shall not occur if the looped service system can not deliver service to process equipment reliant on service. (i.e. House Water / Potable Water used for process equipment/chemical equipment)

(2) Shutdown of this process, system, or equipment is restricted to not pulling more than three (3) random lengths of pipe. Pipe segment does not have to be in-service after 8-hr outage; however, pipe must be joined in the event there is an unexpected break elsewhere.

(3) Shutdown of this process, system, or equipment is restricted to between the hours of 10 p.m. and 4 a.m.

(4) Shutdown of this process, system, or equipment shall not occur at the same time as other items having this note.

(5) For each shutdown, provide a 500 kW temporary generator and cabling to account for unforeseen circumstances that may require work to occur outside the allowable time frame.

(6) Shutdown of these processes shall not occur at the same as a shutdown of either the Primary Basin No. 1 or Primary Basin No. 2.

(7) Shutdowns and tie-ins or other activities that disrupt plant operations shall not occur if the following conditions exist:

a) Rainfall has occurred in the 2 days preceding the shutdown

b) Rainfall is forecast for more than 3 of the first 14 days of the shutdown period.

END OF SECTION

KC WATER

WASTEWATER TREATMENT DIVISION
7300 Hawthorne Road • Kansas City, MO 64120
P: 816-513-7200 • F: 816-513-7271 • www.kcwater.us

Operational Change Control Plan (OCCP) Version 8

OCCP Number & Title (The OCCP number will be provided by the Division OCCP Coordinator)

OCCPs ARE REQUIRED TWO WEEKS IN ADVANCE OF THE ANTICIPATED WORK

This version is being provided as a Word document to enable editing within the document.

Do not delete any sections. Note if a section is not applicable to the proposed work.

Instructions are provided at the beginning of each section. READ THESE CAREFULLY. Provide the information requested. The submitted document is to include this title page.

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1. Date	
2. Version (use modifier starting with A at end of OCCP number when document changes substantially)	
3. OCCP Number	
4. Facility Name/ Facility ID	
5. Project Execution Start Date	

6. Description of Works (provide a brief summary of the work to be performed)

7. Key Plan information (hold points are those points at which work will be halted and operations returned to usual and customary conditions and is not a description of the work to be performed)

Description of Hold Point 1	
Description of Hold Point 2	
Description of Hold Point 3	
Description of Hold Point 4	
Description of Hold Point 5	
Description of Hold Point 6	
Description of Hold Point 7	
Description of Hold Point 8	

8. **Significant Dates** **(this section keys around the OCCP development to include a meeting with WTD staff to define operational collaboration)**

Project is scheduled to start no earlier than (insert date here)	
Action	**Date**
OCCP Initial Development no later than:	
OCCP Final no later than:	
OCCP Coordination Meeting no later than:	
Other as needed:	
Other as needed:	

9. **Project Milestones/Execution Steps** **(define the major work steps and attach a schedule for the work if so developed specifically for this OCCP project)**

Step	**Action and Date (may include start date + X if start is unknown at the time of OCCP development**

Step	Action and Date (may include start date + X if start is unknown at the time of OCCP development

10. Works to be completed prior start of OCCP (this will result from the initial OCCP meeting)

Operational Condition	Contingency Action

11. Contingency Actions (these actions result from plans in the event of adverse project impacts)

Mode of Failure/Incident	Contingency Action

12. Job Hazard Analysis (define any hazards to be encountered that are not usual and customary)

Hazard	Mitigation

13. **Affected monitoring points and impact**

a. **Usual sample locations affected by this operation** (this will result from the initial OCCP meeting)

Description of Element	How is it Affected

b. **Special location(s) established for this operation** (this will result from the initial OCCP meeting)

Description of Location	Describe Revised Procedure

c. **Treatment Process Affected** **(define which process will be impacted and how any alternate or interim operation will be implemented)**

Process Description	Describe Alternate or Interim Operation

d. Alarm Modifications

Alarm name	Alarm Value	Replacement	How Does it Operate?

e. Environmental Spill Risks

Description of Spill Risks	Mitigating Controls

14. Wastewater Quality Impacts

Description of Impact	How It Will Be Managed

15. External Stakeholders To Be Notified (these include neighboring residential and businesses)

Individual or Entity	Name and Phone Number

16. Contractor OCCP Development and Sign Off (these include the prime and any subs performing the work and to ensure all contractor teams are aware of the work plan)

Name and Title	Signature

17. WWTD OCCP Final Authorization and Approval (to include the WTD chain of command from the CPO to the Division Manager and a senior representative from each contractor team)

Name	Title	Signature	Date

CITY OF FOUNTAINS
HEART OF THE NATION
KANSAS CITY
MISSOURI

APPLICATION FOR PAYMENT

Project Number _____

Project Title _____

Final Payment[5] ☐

Application Number[2]:
CONTRACTOR Date:
Ordinance/Resolution Number:
Address Effective:
PO Number
Vendor Number

Application for Work Accomplished from _____ to _____

Original Contract Price		[1]			$	-
Net by Change Orders___through___				[2]	$	-
Current Contract Price (1+2)				[3]	$	-
Completed Work		[4]				
Disputed Amounts[3]	[-]	[4a]	$ -			
Stored Material[4]		[5]	$ -			
Disputed Amounts[3]	[-]	[5a]	$ -			
Total Completed and Stored to Date (4+5)				[6]	$	-
Previous Payments		[7]				
Previous Retainage		[8]				
Total Previous Applications (7+8)				[9]	$	-
Amount This Application (6-9)				[10]	$	-
Less Retainage This Application (5%)				[-] [11]	$	-
Release of Retainage				[12]	$	-
Total Due This Application (10-11+12)				[13]	$	-
Liquidated Damages						
Completion of Work		[14]	$ -	[-]	$	-
Prevailing Wage[7]		[15]	$ -	[-]	$	-
MBE/WBE Program[7]		[16]	$ -	[-]	$	-
Workforce Program[7]		[17]	$ -	[-]	$	-
Total Amount Due Contractor (13 - 14 through 17)				[18]	$	-

Accompanying Documentation: [1, 2, 3, 4, 5, & 6] and any other information as necessary.

NOTE: Initial all figures on this Application and on the Schedule of Values that are changed to correct errors or conform to the amount recommended. Attach explanation of changes that have been made.

CONTRACTOR's Certification:

The undersigned CONTRACTOR certifies that (a) all previous progress payments received from OWNER on account of Work done under this Contract have been applied on account to discharge CONTRACTOR's legitimate obligations incurred in connection with Work covered by all prior Applications for Payment; (b) at time of payment, title of all Work, materials and equipment incorporated into said Work or otherwise listed in or covered by this Application for Payment will pass to OWNER free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to OWNER indemnifying OWNER against any such Lien, security interest or encumbrance); and (c) all Work covered by this Application for Payment is in accordance with the Contract Documents and not defective; and (d) all manufactured goods or commodities used or supplied for this Project are in compliance with Kansas City's Buy America ordinance.

_____ By _____ _____
Contractor Authorized Representative (Print) Signature

Date_____

State of)
)SS
County of)

Subscribed and Sworn to before me this _____ day of _____, _____ .

My commission expires:

Notary Public: _____

DESIGN PROFESSIONAL's Recommendation of Payment:

In accordance with the Contract Documents, based on on-Site observations and the data comprising this application, the DESIGN PROFESSIONAL recommends to the OWNER that to the best of the DESIGN PROFESSIONAL's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the CONTRACTOR is entitled to payment of the Amount above listed in this application.

Name of firm (Print)	DESIGN PROFESSIONAL (Print)	(Signature)

Date: _____

Construction/Program Manager's Recommendation of Payment: (if applicable)

In accordance with the Contract Documents, based on on-Site observations and the data comprising this application, the Construction/Program Manager recommends to the OWNER that to the best of the Construction/Program Manager's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the CONTRACTOR is entitled to payment of the Amount above listed in this application.

Construction/Program Manager firm (Print)	Authorized Representative (Print)	(Signature)

Date: _____

City's Representative's Agreement with Recommendation of Payment

City's Representative(print)	(Signature)	(Date)

City's Approval

The amount previously recommended is approved for payment.

Director or Designee (Print)	(Signature)	(Date)

[1]See General Conditions Article 14.02 A and B

[2]Proof of tax compliance if 1st payment and if Contract amount exceeds $150,000.00

[3]Schedule of Values–Denote any amounts currently disputed in this application. Attach additional dispute documentation if required.

[4]If requesting payment for stored materials, see General Conditions Article 14.02 A.1

[5]If final payment, current proof of tax compliance if Contract is longer than 1 year and amount exceeds $150,000.00.

[6] Per General Conditions Sec. 14.02 attach a copy of the most recent 00485.01 M/WBE Monthly Utilization Report, 00485.02 Project Workforce Monthly Report and 00485.03 Company-Wide Workforce Monthly Report CONTRACTOR has submitted to the City's Human Relations Department

[7]Applicable only if final payment

REMINDER: CONTRACTOR is responsible for meeting or exceeding the the D/M/WBE participation amounts in its Contractor Utilization Plan (CUP) as amended by any previously approved Request for Modification/Substitution. Any Change Orders or amendements modifying the amount CONTRACTOR is to be compensated will have correspondingly impacted the amount of compensation due D/M/WBEs for purposes of meeting or exceeding the Bidder/Proposer participation. CONTRACTOR is again reminded to consider the effect of any Change Order or amendment, and to submit a Request for Modification/Substitution if appropriate.

Distribution: Owner, Contractor, Project Manager, Design Professional

_____

Construction Manager _____ _____

CITY OF FOUNTAINS
HEART OF THE NATION
KANSAS CITY
MISSOURI

SCHEDULE OF VALUES

Project Number _____

Project Title _____

HRD APPROVED CUP		
MBE	WBE	DBE
$0.00	$0.00	$0.00
%	%	%

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
SPEC SECTION	UNIT PRICE CONTRACTS			DESCRIPTION OF WORK UNIT ITEM DESCRIPTION	$ UNIT PRICE	NO. OF UNITS	$ TOTAL OR LUMP SUM	UNITS COMPLETE	$ COMPLETED WORK	$ STORED MATERIAL	$ TOTAL COMPLETED AND STORED TO DATE		TOTALS TO DATE			% AT BOTTOM	$ TOTAL PREVIOUS APPLICATIONS	$ AMOUNT THIS APPLICATION L-R
	UNIT ITEM NO.	UNIT	ESTIMATED QUANTITY								$ J+K	% J/H	$ MBE	$ WBE	$ DBE			
																P/L		
																O/L		
																N/L		

City Of Kansas City, Missouri

Certified Payroll Report Instructions

GENERAL INSTRUCTIONS:

Each space on the attached Certified Payroll Report requiring information is numbered. The numbers below correspond to those spaces. When completing the Certified Payroll Report, insert the required information in each space. The Certified Payroll Report **must be complete, clear and legible** and be accompanied by a completed Payroll Certification including **original signature**. All payrolls are to be submitted within two (2) weeks after the ending date of the payroll week.

The payroll form is available on line.

INSTRUCTION FOR PAYROLL SHEETS

1. **PAYROLL NUMBER**: Insert the number of the payroll. Payrolls start with number 1 (one) for the first week of work by each contractor or subcontractor. The numbers are then continuous until the last payroll. During weeks when no work takes place a payroll for that week showing no work is to be turned in. Revised payrolls must be designated with a letter "R" following the number. Check (✓) the box by the word "FINAL" after the number to indicate that no further work will be done by the contractor or subcontractor.

2. **WEEK ENDING**: On each sheet, insert the date of the last day of this payroll.

3. **SHEET OF**: On each sheet, insert the number of each sheet and the total number of sheets submitted.

4. **GRANT AGENCY PROJECT NO:** Insert the Grant Agency Project Grant Number if this is a grant funded project.

5. **CONTRACTOR**: Insert the contractor's company name and address.

6. **SUBCONTRACTOR**: If this is a payroll for a subcontractor, insert subcontractor's name and address. For the remainder of these instructions, the word "contractor" shall apply to both contractor and subcontractor.

7. **DEPARTMENT PROJECT or CONTRACT NO**: Insert Department's Project or Contract Number.

8. **LOCATION**: Insert location of work, including address, and county.

9. **DESCRIPTION**: Insert name of the project or contract from the Agreement.

10. **FEDERAL I.D. NUMBER**: Insert the contractor (10a) and subcontractor's (10b) Federal I.D. Number.

11. **EMPLOYEE NAME**: Insert employee's full legal name and complete home address. Make sure to include Apartment #'s and zip code.

12. **SOCIAL SECURITY NO**.: Insert employee's social security number (xxx-xx-xxxx).

13. **DATE**: Insert date for each day of the payroll week for each employee (mm/dd/yyyy).

14. **REGULAR HOURS***: Insert the regular hours worked each day.

15. **OVERTIME HOURS***: Insert the overtime hours worked each day.

16. **DOUBLE OVERTIME HOURS*:** Insert the double overtime hours worked each day.

    ***Note:** Numbers 14, 15, and 16: Make sure these **hours are equal to or greater than the hours turned in on the "Daily Labor Force Report" form.** Refer to the wage order for applicable overtime schedule.

    If allowed by occupational title's applicable overtime rate, Contractor may make a permanent schedule transfer to an eight (8) or ten (10) hour day work week. **Advance written notification to and approval** from the Owner's Representative **is required**.

    If allowed by the occupational title's applicable overtime rate, any change in the work week schedule due to inclement weather **must** be documented on the certified payroll.

17. **TOTAL HOURS**: Insert total of *regular hours* worked for the week on this project. (The total hours will calculate automatically if you are using the electronic form.)

18. **TOTAL HOURS**: Insert total of *overtime hours* worked for the week on this project. (The total hours will calculate automatically if you are using the electronic form.)

19. **TOTAL HOURS:** Insert total of *double overtime* hours worked for the week on this project. (The total hours will calculate automatically if you are using the electronic form.)

20. **TOTAL FRINGE HOURS**: Insert total Fringe Hours (by adding the amounts in 17, 18, and 19). (The total hours will calculate automatically if you are using the electronic form.)

21. **BASE RATE***: Insert basic hourly rate of pay. Check the contract's "Annual Wage Order" or the "Federal General Wage Decision" section for basic hourly rate.

22. **OVERTIME RATE***: Insert overtime rate of pay. Check the contract's "Annual Wage Order" or the "Federal General Wage Decision" section for the overtime rate.

23. **DOUBLE OVERTIME RATE***: Insert double overtime rate of pay. Check the contract's "Annual Wage Order" or the "Federal General Wage Decision" section for the double overtime rate.

24. **FRINGE RATE***: Insert fringe benefit rate for this project. Check the contract's "Annual Wage Order" or the "Federal General Wage Decision" section for the fringe benefit rate.

    ***Note**: *The total of the basic hourly rate plus the fringe benefit rate must be equal to or greater than the total of the basic hourly rate plus the fringe benefit rate found in the contract's "Annual Wage Order" or the "Federal General Wage Decision" section. If the contract contains both of the above, the higher rate will prevail.*

25. **TOTAL**: Multiply the amounts in 17 by 21 and insert here. (The total hours will calculate automatically if you are using the electronic form.)

26. **TOTAL**: Multiply the amounts in 18 by 22 and insert here. (The total hours will calculate automatically if you are using the electronic form.)

27. **TOTAL**: Multiple the amounts in 19 by 23 and insert here. (The total hours will calculate automatically if you are using the electronic form.)

28. **TOTAL**: Multiply the amounts in 20 by 24 and insert here. (The total hours will calculate automatically if you are using the electronic form.)

29. Check (✓) the box (☐) for the "*APPROVED PLAN*", "*EMPLOYEE",* or both indicating the Plan or manner in which the fringe benefit is paid. If fringe benefit is paid to both a Plan and the employee, then insert each amount that is paid to the Plan and/or the employee. If paid to a Plan, list the name(s) of Plan Programs on Payroll Certification page.

    ***Note:** 29a plus 29b **must equal** 28**.**

30. **OCCUPATIONAL TITLE/CLASSIFICATION**: Insert occupational title/classification of worker for each employee. Examples: Carpenter, laborer, electrician.

31. **GROUP**: Insert the group if, applicable for the occupational title/classification. Example: Operating Engineers Group I, II, III, IV or V.

32. **SKILL GROUP**: Insert skill group, if applicable. Example: general laborer, skilled laborer, first semi-skilled, second semi-skilled etc. or any of the listings under the federal classification such as painters.

33. **HOURS**: Insert total hours worked for all jobs for each employee during each payroll period.

34. **GROSS EARNINGS**: Insert employee's gross earnings for each payroll period.

35. **FEDERAL**: Insert the amount of the deduction from each employee's check stub.

36. **FICA**: Insert the amount of the deduction from each employee's check stub.

37. **STATE**: Insert the amount of the deduction from each employee's check stub.

38. **LOCAL E-TAX**: Insert the amount of the deduction from each employee's check stub.

39. **MISCELLANEOUS**: Insert the amount of the deduction from each employee's check stub.

40. **NET PAY**: Insert the employee's net pay for each week.

41. **EARNINGS FOR THIS JOB**: Add the amounts in 25, 26, 27, and 29b and insert here.

    ***Note**: If fringe benefit is paid to Approved Plan, do not add the amount in 29a to this total.

42. **KANSAS CITY EARNINGS TAX THIS JOB**: Insert Kansas City Earnings tax deducted from employee's check for this job.

Steps 11 through 42 are to be repeated for each employee working on the project site, or for the same employee working any additional Occupational Title/Classification.

CITY OF FOUNTAINS
HEART OF THE NATION
KANSAS CITY
MISSOURI

CERTIFIED PAYROLL REPORT

Project Number:

Project Title:

Payroll Number: (1) ☐ **Final**

WEEK ENDING: (2)		SHEET (3)	of	GRANT AGENCY PROJECT NO.: (4)	
CONTRACTOR: (5)		SUBCONTRACTOR: (6)		DEPT PROJECT OR CONTRACT NO.: (7)	
ADDRESS:		ADDRESS:		LOCATION: (8)	
CITY, STATE ZIP:		CITY, STATE ZIP:		DESCRIPTION: (9)	
FEDERAL I.D. NUMBER: (10a)		FEDERAL I.D. NUMBER: (10b)			

First Name / Last Name	DATE: (13)	MON	TUES	WED	THUR	FRI	SAT	SUN	TOTAL HRS.	BASE RATE	O.T. RATE	FRINGE RATE	TOTAL
EMPLOYEE NAME: (11)													
ADDRESS:	REG. HRS. (14)								(17) 0.00	$ (21) -			$ (25) -
CITY, STATE ZIP:	O.T. HRS. (15)								(18) 0.00		$ (22) -		$ (26) -
SOCIAL SECURITY NO.: (12)	D.O.T. HRS. (16)								(19) 0.00		$ (23) -		$ (27) -
OCCUPATIONAL TITLE / CLASSIFICATION:						TOTAL FRINGE HOURS (20)			0.00			$ (24) -	$ (28) -
(30)											FRINGE PAID TO:	☐ APPROVED PLAN (29a)	
	GROUP: (31)		SKILL GROUP: (32)								(29)	☐ EMPLOYEE	$ (29b) -

WEEK ALL JOBS:	HOURS:	GROSS EARNINGS:	FEDERAL:	FICA:	STATE:	LOCAL E-TAX:	MISC:	NET PAY:	EARNINGS FOR THIS JOB:	$ (41) -
	(33)	$ (34) -	$ (35) -	$ (36) -	$ (37) -	$ (38) -	$ (39) -	$ (40) -	KANSAS CITY EARNINGS TAX THIS JOB	$ (42) -

First Name / Last Name	DATE:	MON	TUES	WED	THUR	FRI	SAT	SUN	TOTAL HRS.	BASE RATE	O.T. RATE	FRINGE RATE	TOTAL
EMPLOYEE NAME:													
ADDRESS:	REG. HRS.								0.00	$ -			$ -
CITY, STATE ZIP:	O.T. HRS.								0.00		$ -		$ -
SOCIAL SECURITY NO.:	D.O.T. HRS.								0.00		$ -		$ -
OCCUPATIONAL TITLE / CLASSIFICATION:						TOTAL FRINGE HOURS			0.00			$ -	$ -
											FRINGE PAID TO:	☐ APPROVED PLAN	$ -
	GROUP:		SKILL GROUP:									☐ EMPLOYEE	$ -

WEEK ALL JOBS:	HOURS:	GROSS EARNINGS:	FEDERAL:	FICA:	STATE:	LOCAL E-TAX:	MISC:	NET PAY:	EARNINGS FOR THIS JOB:	$ -
		$ -	$ -	$ -	$ -	$ -	$ -	$ -	KANSAS CITY EARNINGS TAX THIS JOB	$ -

First Name / Last Name	DATE:	MON	TUES	WED	THUR	FRI	SAT	SUN	TOTAL HRS.	BASE RATE	O.T. RATE	FRINGE RATE	TOTAL
EMPLOYEE NAME:													
ADDRESS:	REG. HRS.								0.00	$ -			$ -
CITY, STATE ZIP:	O.T. HRS.								0.00		$ -		$ -
SOCIAL SECURITY NO.:	D.O.T. HRS.								0.00		$ -		$ -
OCCUPATIONAL TITLE / CLASSIFICATION:						TOTAL FRINGE HOURS			0.00			$ -	$ -
											FRINGE PAID TO:	☐ APPROVED PLAN	$ -
	GROUP:		SKILL GROUP:									☐ EMPLOYEE	$ -

WEEK ALL JOBS:	HOURS:	GROSS EARNINGS:	FEDERAL:	FICA:	STATE:	LOCAL E-TAX:	MISC:	NET PAY:	EARNINGS FOR THIS JOB:	$ -
		$ -	$ -	$ -	$ -	$ -	$ -	$ -	KANSAS CITY EARNINGS TAX THIS JOB	$ -

First Name / Last Name	DATE:	MON	TUES	WED	THUR	FRI	SAT	SUN	TOTAL HRS.	BASE RATE	O.T. RATE	FRINGE RATE	TOTAL
EMPLOYEE NAME:													
ADDRESS:	REG. HRS.								0.00	$ -			$ -
CITY, STATE ZIP:	O.T. HRS.								0.00		$ -		$ -
SOCIAL SECURITY NO.:	D.O.T. HRS.								0.00		$ -		$ -
OCCUPATIONAL TITLE / CLASSIFICATION:						TOTAL FRINGE HOURS			0.00			$ -	$ -
											FRINGE PAID TO:	☐ APPROVED PLAN	$ -
	GROUP:		SKILL GROUP:									☐ EMPLOYEE	$ -

WEEK ALL JOBS:	HOURS:	GROSS EARNINGS:	FEDERAL:	FICA:	STATE:	LOCAL E-TAX:	MISC:	NET PAY:	EARNINGS FOR THIS JOB:	$ -
		$ -	$ -	$ -	$ -	$ -	$ -	$ -	KANSAS CITY EARNINGS TAX THIS JOB	$ -

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

CERTIFIED PAYROLL REPORT

Project Number: _____

Project Title: _____

Payroll Number: _____ **Final**

| | | |

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Date _____

I, _____, _____
(Name of Signatory Party) (Title)
do hereby state:

(1) That I pay or supervise the payment of the persons employed by (Contractor or subcontractor)_____ on the (Building or work)_____: that during the payroll period commencing on the _____ day of _____, 20___, and ending the _____ day of _____, 20___, all said persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said (Contractor or subcontractor) _____from the full weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 CFR Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948.63 Stat. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. 276c), and described below:

_____
_____
_____
_____

(2) That any payrolls otherwise required under this contract to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained herein are not less than the applicable wage rates contained in any wage determination incorporated into this contract; that the classifications set forth herein for each laborer or mechanic conform to the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:

(a) WHERE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

❑ In addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, consisting of _____ pages, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, exceptions noted in 4 (c) below.

(b) WHERE BENEFITS ARE PAID IN CASH

❑ Each laborer or mechanic listed in the above referenced payroll, consisting of _____ pages, has been paid, as indicated on the payroll, in an amount not less than the sum of the basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in Section 4 (c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION
REMARKS	

NAME AND TITLE	SIGNATURE
The willful falsification of any of the above statements may subject the contractor or subcontractor to civil or criminal prosecution. See Section 1001 of Title 18 Section 231 of Title 31 of the United States Code.	

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

SUBCONTRACTORS AND MAJOR MATERIAL SUPPLIERS LIST

Project Number _____ Project Title _____

From Contractor _____ To _____ Date _____

Spec. No.	Section Title	4	Firm, Address (Check box if Supplier)	Phone, FAX and e-mail	Contact

❑ Attachments:

Signed by: _____ Date _____

Distribution: ❑ Owner ❑ Contractor ❑ Construction Manager ❑ Design Professional ❑ Consultant ❑ Other

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

DAILY LABOR FORCE REPORT

Project Number _____ Day _____ Date _____
Project Title _____
Contractor _____
Subcontractor _____

Weather: (Indicate if weather prevented work and why) _____
_____
_____

Shift: (circle) 5–8 hr Days 4–10 hr Days Other _____

* This report *MUST be completed and turned in* for EACH DAY until FINAL COMPLETION.

Worker's Full Legal Name	**Occupational Title or Classification Group & Skill**	**Hours Worked & Time (i.e. 10AM – 4PM)**	**Race & Gender**

I CERTIFY THAT ALL OF THE INFORMATION PROVIDED ABOVE IS TRUE AND COMPLETE.
Contractor/Subcontractor Representative:

Complete Name: (print) _____ Title: (print) _____

Signature: _____ Page ____ of ____

Distribution: ❑ City Department ❑ Contractor ❑ Subcontractor ❑ Other

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

CERTIFICATE OF SUBSTANTIAL COMPLETION

Project Number _____

Project Title _____

CONTRACT FOR: _____

CONTRACTOR: _____

DATE OF ISSUANCE: _____

PROJECT OR DESIGNATED PORTION SHALL INCLUDE:

The Work performed under this Contract has been reviewed and found, to the Design Professional's and/or Construction Manager's best knowledge, information and belief, to be substantially complete. Substantial Completion is the state in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of Project or portion thereof designated above is hereby established as _____ which is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:

A list of items to be completed or corrected is attached hereto. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

CONSTRUCTION MANAGER	BY	DATE
DESIGN PROFESSIONAL	BY	DATE

The Contractor will complete or correct the Work on the list of items attached hereto within _____ days from the above date of Substantial Completion.

CONSTRUCTION MANAGER	BY	DATE
DESIGN PROFESSIONAL	BY	DATE

The Owner accepts the Work or designated portion thereof as substantially complete and will assume full possession thereof at _____ (time) on _____(date).

OWNER'S REPRESENTATIVE	BY	DATE

Distribution:
- ❑ Owner
- ❑ Contractor
- ❑ Construction Manager
- ❑ Design Professional
- ❑ Consultant _____
- ❑ Other _____

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

PUNCH LIST

Project Number _____

Project Title _____

CONTRACTOR _____

From _____ Site Visit Date _____

The following items require the attention of the CONTRACTOR for completion or correction. This list may not be all-inclusive, and the failure to include any items on this list does not alter the responsibility of the CONTRACTOR to complete all Work in accordance with the Contract Documents.

Item No.	Location (Area)	Description	Correction/ Completion Date	Verification Check

❑ Attachments

Signed by: Date:

DESIGN PROFESSIONAL (Firm/In House)

Distribution:
- ❑ OWNER
- ❑ CONTRACTOR
- ❑ DESIGN PROFESSIONAL
- ❑ Consultant _____
- ❑ Other _____

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

CONTRACTOR AFFIDAVIT FOR FINAL PAYMENT

Project Number _____

Project Title _____

STATE OF _____)
)SS
COUNTY OF _____)

The Undersigned, _____ of lawful
(Name)
age, being first duly sworn, states under oath as follows:

1. I am the _____ of _____who is the general
(Title) (CONTRACTOR)
CONTRACTOR for the CITY on Project No. _____ and Project Title _____.

2. All payrolls, material bills, use of equipment and other indebtedness connected with the Work for this Project have been paid and all Claims of whatever nature have been satisfied, as required by the Contract.

3 (✓) ____Prevailing wage does not apply; or

(✓) ____All provisions and requirements set forth in Chapter 290, Section 290.210 through and including 290.340, Missouri Revised Statutes, pertaining to the payment of wages to workmen employed on public works projects have been fully satisfied and there has been no exception to the full and complete compliance with these provisions and requirements and the Annual Wage Order contained in the Contract in carrying out the Contract and Work. CONTRACTOR has fully complied with the requirements of the prevailing wage law as required in the Contract and has attached affidavits from all Subcontractors on this Project, regardless of tier, affirming compliance with the prevailing wage law as stipulated in the Contract.

4. I hereby certify that (a) at project completion and pursuant to contractor's final request for payment, contractor achieved (_____%) Minority Business Enterprise (MBE) participation and (_____%) Women Business Enterprise (WBE) participation on this contract, and (b) listed herein are the names of all certified M/WBE subcontractors, regardless of tier, with whom I, or my subcontractors contracted.

1. Name of MBE/WBE Firm _____
Address _____
_____
Telephone Number (_____) _____
IRS Number _____
Area/Scope*of Work _____
Subcontract Final Amount _____

2. Name of MBE/WBE Firm _____
Address _____
_____
Telephone Number (_____) _____
IRS Number _____
Area/Scope*of Work_____
Subcontract Final Amount _____

List additional subcontractors, if any, on a similar form and attach to the bid.

Supplier** Final Amount: _____

*Reference to specification sections or bid item number.

(✓) ____ Met or exceeded the Contract utilization goals; or
(✓) ____ Failed to meet the Contract utilization goals (attach waiver, substitution or modification); or
(✓) ____ No goals applied to this Project.

5. CONTRACTOR certifies that each Subcontractor has received full payment for its respective work in connection with the Contract.

6. If applicable, I hereby certify that (a) at project completion and pursuant to contractor's final request for payment, contractor achieved, company-wide, at least ten percent (10%) minority workforce participation and two percent (2%) women workforce participation and (2) a true and accurate copy of my final project workforce monthly report (HRD Form 00485.02 and final company-wide workforce monthly report (HRD Form 00485.03) are attached. **NOTE: This paragraph is only applicable if you completed a construction contract that was estimated by the City, prior to solicitation, as requiring more than 800 construction labor hours and costing in excess of $324,000.01. If applicable you MUST attach copies of your final monthly workforce reports.**

7. This affidavit is made in behalf of the CONTRACTOR for the purpose of securing from Kansas City, Missouri, the certification of completion of the Project and receiving payment therefore.

8. If the Contract amount exceeded $150,000, CONTRACTOR has submitted proof of compliance with the City tax ordinances administered by the City's Commissioner of Revenue and has on file proof of tax compliance from all Subcontractors. If the Contract term exceeded one (1) year, CONTRACTOR has provided proof of compliance with the City tax ordinances administered by the City's Commissioner of Revenue prior to receiving final payment and has on file proof of tax compliance from all Subcontractors prior to the Subcontractor receiving final payment from CONTRACTOR.

CONTRACTOR_____

By _____
(Authorized Signature)

Title _____

On this _____ day of _____, _____, before me

appeared _____, to me personally known to be the

_____of the_____,

and who executed the foregoing instrument and acknowledged that (s)he executed the same on behalf of

_____ as its free act and deed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal on the day and year first above written.

My commission expires:

_____ _____
Notary Public

CITY OF FOUNTAINS
HEART OF THE NATION
KANSAS CITY
MISSOURI

SUBCONTRACTOR AFFIDAVIT FOR FINAL PAYMENT

Project Number _____

Project Title _____

STATE OF MISSOURI)

) ss:

COUNTY OF _____)

After being duly sworn the person whose name and signature appears below hereby states under penalty of perjury that:

1. I am the duly authorized officer of the business indicated below (hereinafter Subcontractor) and I make this affidavit on behalf of Subcontractor in accordance with the requirements set forth in Section 290.290, RSMo. Subcontractor has completed all of the Work required under the terms and conditions of a subcontract as follows:

Subcontract with: _____, Contractor

Work Performed: _____

Total Dollar Amount of Subcontract and all Change Orders: $_____

City Certified ☐MBE ☐ WBE ☐ DBE ☐ NA
List certifications: _____

2. Subcontractor fully complied with the provisions and requirements of the Missouri Prevailing Wage Law set forth in Sections 290.210, RSMo through 290.340, RSMo.

Business Entity Type:
(___) Missouri Corporation
(___) Foreign Corporation
(___) Fictitious Name Corporation
(___) Sole Proprietor
(___) Limited Liability Company
(___) Partnership
(___) Joint Venture
(___) Other (Specify)

Subcontractor's Legal Name and Address

_____

_____
Phone No. _____
Fax: _____
E:mail:_____
Federal ID No._____

I hereby certify that I have the authority to execute this affidavit on behalf of Subcontractor.

By: _____ _____
(Signature) (Print Name)

_____ _____
(Title) (Date)

NOTARY

Subscribed and sworn to before me this _____ day of _____, 20_____.

My Commission Expires:_____ By_____

_____ _____
Print Name Title

SECTION 01300 – SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY

A. This section provides for the submittals required by the City prior to the start of work and, as required, for the duration of the Work.
B. All submittals shall be clearly identified by reference to a specification section and/or detail drawing. Submittals shall be clear and legible and shall include sufficient presentation of the data.
C. No portion of the work requiring a shop drawing, product data or sample shall be started nor shall any materials be fabricated or installed prior to the completion of the submittal process described herein. Fabrication performed, purchased materials or on-site construction accomplished prior to completing the submittal process as defined herein shall be at the Contractor or Design-Builder's sole risk. The City shall not be liable for any expense or delay to complete the submittal process.

1.02 RELATED SECTIONS

A. Section DB 00700 – General Conditions (Design-Build Project Delivery)
B. Section DB 00800 – Supplementary Conditions (Design-Build Project Delivery)
C. Section 00700 – General Conditions (Design-Bid-Build Project Delivery)
D. Section 00800 – Supplementary Conditions (Design-Bid-Build Project Delivery)
E. Section 01019 – Closeout Procedures
F. Section 01020 – Record Documents
G. Section 01021 – Operation and Maintenance Data
H. Section 01140 – Work Restrictions
I. Section 01140.01 - Process and System Shutdown Constraints Schedule
J. Section 01140.02 - Operation Change Control Plan Documents
K. Section 01020 – Record Documents
L. Section 01320 – Construction Progress Documentation
M. Section 01322 – Photogram Documentation
N. Section 01019 – Closeout Procedures
O. Section 01664 - Training
P. Section 01757 – Commissioning
Q. Section 01335 – Document Management.

1.03 GENERAL INFORMATION

A. Definitions:
   1. Refer to Section 01420 – Definitions and Acronyms
B. Quality Requirements:
   1. The Contractor or Design-Builder shall submit Shop Drawings and Samples in accordance with Section 00700.
   2. Submittals such as Shop Drawings and product data shall be of suitable quality for legibility and reproduction purposes. Every line, character and letter shall be clearly legible. Drawings shall be useable for further reproduction to yield legible hard copies.
   3. All submittals by subcontractors shall be sent directly to the Contractor or Design-Builder for checking. The Contractor or Design-Builder shall be responsible for their submission at the proper time to prevent delays.

4. The Contractor or Design-Builder shall check all subcontractors' submittals regarding measurements, sizes, materials and details to determine and verify that they meet the requirements of the Contract Documents. Submittals found to be inaccurate or otherwise in error shall be returned to the subcontractors for correction before submission to the City.
5. Certificates of Compliance – Where indicated in these specifications, each submittal shall include a certificate of compliance prepared by the manufacturer or Supplier of the submitted data, certifying that the item covered complies with Contract Documents. The certificate of compliance shall be a separate document and shall include identification of all deviations, if any, from the Contract Documents.

C. Submittal Completeness:
1. The Contractor or Design-Builder shall accept full responsibility for the completeness of each submission. When an item consists of components from several sources, the Contractor or Design-Builder's initial submittal on the item shall include all components.
2. Submittals shall be complete with respect to dimensions, design criteria, materials of construction and other information specified to enable the City or Designee to review the information effectively.
3. Where standard drawings are furnished which cover several variations of the general class of Equipment, each drawing shall be annotated to indicate exactly which parts of the drawing apply to the Equipment being furnished. Use hatch marks to indicate variations that do not apply to the Submittal. The use of "highlighting markers" will not be an acceptable means of annotating Submittals. Annotation shall also include proper identification of the Submittal permanently attached to the drawing.
4. Reproductions or copies of Contract Drawings or portions thereof will not be accepted as complete fabrication or erection drawings. The Contractor or Design-Builder may use a reproduction of Contract Drawings for erection drawings to indicate information on erection or to identify detail drawing references. Whenever the Drawings are revised to show this additional Contractor or Design-Builder information, the Design Professional's title block shall be replaced with Contractor or Design-Builder's title block and the Design Professional's professional seal shall be removed from the drawing. The Contractor or Design-Builder shall revise these erection drawings, as needed, for subsequent Design Professional revisions to the Contract Drawings.

D. Form of Submittals:
1. Submittals and other Project documents shall be transmitted in electronic format and non-electronic format as specified.
2. Contractor or Design-Builder shall provide a submittal registry prior to the pre-con meeting that is suitable for upload to the City's Document Management program.
3. Electronic Format:
   (a) Transmit Submittals and Project documents utilizing:
      (i) Adobe ".pdf" files created directly from native electronic format or City-approved equal file type and format.
      (ii) Electronic submittal ".pdf" files are not to be combined files or collections of files/drawings. Each drawing document must stand alone.
      (iii) Each file will be right reading and oriented the same for all consecutive resubmissions.
      (iv) For any given Submittal, the filename and format shall be consistent for initial submission and subsequent revisions of the same. Use consistent naming convention throughout. Reference to revision or dates shall not be included in a filename.

(v) Files greater than 5 pages shall have table of contents with bookmarks for each section. The Sections shall have easily understood names.

(vi) Submittals not meeting the above criteria are subject to rejection.

(b) Provide Project Record Documents, equipment instruction books and operating and maintenance manuals and any other documents, as required, in a file type and format approved by City.

4. Non-electronic Format:
   (a) Selected Submittals may be provided in paper (hard copy), as well, only with advance approval of the City and using procedures specified herein.
   (b) Equipment instruction books and operating manuals shall be provided in hardcopies in addition to the specified electronic format.

E. Transmittal of Submittals:
1. Submittal register shall be uploaded prior the transmission of the first submittal.
2. All submittals, regardless of origin, shall be stamped with the approval of the Contractor or Design-Builder and identified with the name and number of this Contract, Contractor's or Design-Builder's name, references to applicable specification paragraphs and Contract Drawings and version of the submittal. Submittals can be named for their specification if the submittals cover the full scope of work in said specification.
3. Each submittal shall indicate the intended use of the item in the Work. When catalog pages are submitted, applicable items shall be clearly identified and inapplicable data crossed out. The current revision, issue number and date shall be indicated on all drawings and other descriptive data. The Contractor or Design-Builder's stamp of approval is a representation to the City and Design Professional that the Contractor or Design-Builder accepts full responsibility for determining and verifying all quantities, dimensions, field construction criteria, materials, catalog numbers and similar data, and the Contractor or Design-Builder has reviewed and coordinated each submittal with the requirements of the Work and the Contract Documents.
4. Electronic Submittals – The Contractor or Design-Builder shall utilize the City's document management system as specified in Section 01335- Document Management for managing, tracking and storing documents associated with the Project. If an internet-based document management system is to be used, additional requirements are provided in Section 01335- Document Management. The Contractor or Design-Builder shall comply with the file protocols and procedures for the document management system.
5. Approved submittals shall be tagged per City's metadata tagging standard and provided to the City as part of the Electronic O&M Manual.

F. Submittals Required for the Preconstruction Conference:
1. Following are the minimum required submittals to be provided by the Contractor or Design-Builder at the pre-construction conference:
   (a) General Requirements:
      (i) Preliminary Project Schedule including Submittals.
      (ii) Preliminary Schedule of Values.
      (iii) Preliminary Submittal Registry.
      (iv) Listing of Subcontractors.
      (v) Project Sign Request.
      (vi) List of Major Equipment utilized.
      (vii) Safety Representative.
   (b) Document Management can be found in Section 01335 – Document Management.

G. In order to allow expedited review submittals on the sections or topics below are required to have a pre-submittal meeting:
1. Commissioning Schedule.

2. Sanitary Screens.
3. First Factory Acceptance Test Plan.
4. Switchgear and Transformer.
5. PLC Programming.

1.04 SHOP DRAWINGS AND SAMPLES

A. Shop Drawings:
   1. Shop Drawings and engineering data covering all equipment and fabricated and building materials which will become a permanent part of the Work under this Contract shall be submitted to the City or Designee for review as specified herein. The data shall include drawings, descriptive information, sufficient detail to show the kind, size, arrangement and operation of component materials and devices; the external connections, anchorages and supports required; performance characteristics; and dimensions needed for installation and correlation with other materials and equipment.
   2. All deviations from the Contract Documents shall be identified on each submittal and shall be tabulated in the Contractor or Design-Builder's letter of transmittal. Such submittals shall, as pertinent to the deviation, indicate essential details of all changes proposed by the Contractor or Design-Builder (including modifications to other facilities that may be a result of the deviation) and all required piping and wiring diagrams.

B. Product Data:
   1. Product data as specified in individual Sections, include, but are not necessarily limited to, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing and printed product warranties, as applicable to the Work.
   2. If applicable, submittals for equipment shall include a listing of all installations where identical or similar equipment has been installed and been in operations for a period of at least one year.
   3. Certificates are statements printed on the manufacturer's or supplier's letterhead and signed by responsible officials of manufacturer of product, system or material. Certifications shall provide a clear statement that the product, system or material meets the specified requirements of Contract Documents. All certificates shall be dated after the Effective Date of the contract and shall clearly indicate the project name and project number.

C. Samples:
   1. Samples specified in individual Sections, include, but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols and units of work to be used by the City or Designee for independent inspection and testing, as applicable to the Work.

D. Instruction Books and Operating and Manuals:
   1. Per Section 01021 – Operation Maintenance Data

E. Record Documents
   1. Per Section 011019 Closeout Procedures, 01021 Operation Maintenance Data, 01020 Record Documents, 01322 Photographic Documentation

F. Survey Data
   1. All field books, notes, videotapes, and other data developed by Contractor in performing surveys required as part of the Work shall be available to City for examination throughout the construction period.
   2. All such data shall be submitted to City with the other documentation required for final acceptance of the Work.

1.05 SCHEDULES
A. 01320 - Construction Progress Documentation

1.06 COMMISSIONING SUBMITTALS
A. Section 01757 – Commissioning

1.07 CONSTRUCTION PROGRESS PHOTOGRAPHS AND VIDEOS
A. Section 01320 Construction Progress Documentation
B. Photos and Videos documenting assets that will not be visible during the substantial completion walkthrough shall have their record photos taken prior to be obscured by backfill, equipment installation, gypsum board installation, etc… Record photos shall have metadata tags per KC Water standards.

1.08 WARRANTY and BONDS and CLOSEOUT SUBMITTALS
A. Section 011019 Closeout Procedures, Section 00800 Supplementary Conditions, and 00700 General Conditions

1.09 SCHEDULE OF VALUES
A. The CONTRACTOR shall prepare and submit to the DESIGN PROFESSIONAL for approval by the preconstruction conference, a Schedule of Values for and covering the Lump Sum Price Bid as shown in the Proposal. The Schedule of Values shall show the estimated total number of construction units for each kind of work and the value of each unit.
B. Each price listed shall include all overhead, other costs, CONTRACTOR's profit and the total estimated value of the items of work listed in the Schedule of Values shall equal the Contract Lump Sum Price covered by the estimate. Overhead and profit are not to be listed as separate items.
C. An unbalanced schedule of values providing for overpayment of CONTRACTOR on items of Work which would be performed first will not be approved. The Schedule of Values shall be revised and resubmitted until acceptable to the DESIGN PROFESSIONAL & OWNER. Final acceptance by DESIGN PROFESSIONAL shall indicate only consent to the Schedule of Values as a basis for preparation of applications for progress payments and shall not constitute an agreement as to the value of each indicated item.

1.10 CITY OR DESIGNEE'S REVIEW OF DRAWINGS AND DATA
A. The City or Designee's review of drawings and data submitted by Contractor or Design-Builder will cover only general compliance with the Construction Contract Documents. The City or Designee's review does not indicate a thorough review of all dimensions, quantities and details of the material, equipment, device or item shown. The City or Designee's review shall not relieve Contractor or Design-Builder of Contractor or Design-Builder's responsibility for errors, omissions or deviations in the drawings and data, nor of sole responsibility for compliance with the Construction Contract Documents.
B. The City or Designee's submittal review period shall be 21 consecutive calendar days in length and shall commence on the first calendar day immediately following the date of arrival

of the submittal or resubmittal in the City or Designee's office. The time required to mail the submittal or resubmittal back to Contractor or Design-Builder shall not be considered a part of the submittal review period.

C. Contractor or Design-Builder may request an expedited review of a limited number of submittals. The City may elect to require a workshop to facilitate this expedited review. A maximum of one workshop per week will be allowed.

D. Submittals shall be returned to the Contractor or Design-Builder under one of the following assignments:
   1. "Approved" is assigned when there are no notations or comments on the submittal. When returned, the Contractor or Design-Builder may release the equipment and/or material for manufacture.
   2. "Approved as Noted" is assigned when a confirmation of the notations and comments is not required by the Contractor or Design-Builder. The Contractor or Design-Builder may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.
   3. "Revise and Resubmit" is assigned when the submittal does not meet the intent of the Construction Contract Documents. The Contractor or Design-Builder must resubmit the document revised to bring the submittal into compliance with Contract Documents. "Revise and Resubmit" is also assigned when notations and comments are extensive enough to require a resubmittal of the package.
   4. "Rejected" is assigned when the submittal does not meet the intent of the Construction Contract Documents. The Contractor or Design-Builder must resubmit the entire package revised to bring the submittal into compliance with Contract Documents. It may be necessary to resubmit using a different manufacturer/vendor to meet the Construction Contract Documents. "Rejected" is also assigned when the notations and comments are extensive enough to require a resubmittal of the package.
   5. "For Record Only" is assigned when the submittal is provided as a courtesy to the City or as a contractual requirement by the Design-Builder or Contractor. Design-Builder or Contractor has no further action required. Submittal is for supplementary information only; pamphlets, general information sheets, catalog cuts, standard sheets, test reports, manufacturer's or supplier's letters included with submittal data, unmarked catalog data, bulletins and similar data, all of which are useful to Owner in design, operation, or maintenance, but which by their nature does not constitute a basis for determining that items represented thereby conform with the design concept or comply with the intent of the Contract Documents. It is not subject to Owner's review and acceptance, and is being filed for Record Copy purposes only. This is generally used in acknowledging receipt of means and methods of construction work plans, filed conformance test reports, health and safety plans, or structural design by the Design-Builder's or Contractor Engineer of Record, etc.

E. If the Contractor or Design-Builder considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, the Contractor or Design-Builder shall give written notice thereof to the City or Designee at least seven working days prior to release for manufacture.

F. Resubmittal of Drawings and Data:
   1. The Contractor or Design-Builder shall accept full responsibility for the completeness of each resubmittal. The Contractor or Design-Builder shall verify that all corrected data and additional information previously requested by the City or Designee are provided on the resubmittal. When corrected copies are resubmitted, the Contractor or Design-

Builder shall in writing direct specific attention to all revisions and shall list separately any revisions made other than those called for by the City or Designee on previous submissions.

2. Requirements specified for initial submittals shall also apply to resubmittals. Resubmittals shall bear the number of the first submittal followed by a letter (A, B, etc.) to indicate the sequence of the resubmittal.
3. Resubmittals shall be made within thirty (30) days of the date of the letter returning the submittal to be modified or corrected; unless, within 14 days, the Contractor or Design-Builder submits an acceptable request for an extension of the stipulated period, listing the reasons the resubmittal cannot be completed within the specified time.
4. Any need for more than one resubmission or any other delay in obtaining the City or Designee's review of submittals, will not entitle the Contractor or Design-Builder to an extension of the Contract Times, unless: the delay of the Work is directly caused by a change in the Work authorized by a Change Order or by failure of the City or Designee to review the submittals within the submittal review period specified herein.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used

END OF SECTION

SECTION 01320 – PROJECT MANAGEMENT AND CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the construction process beginning with the Notice of Intent to Contract and continuing through completion of the Work performed and Construction Contract close out.

B. The Contractor or Design-Builder shall furnish all labor, materials, equipment and incidentals as necessary to comply with these requirements including but not limited to the following and as required herein:

1. Preliminary Project Schedule.
2. Project Baseline Schedule.
3. Progress Schedule.
4. Recovery Schedules.
5. Submittals Schedule.
6. Daily Labor Force reports.
7. Material location reports.
8. Field condition reports.
9. Special reports.
10. Commissioning
11. Training
12. O&M Data
13. Electronic O&M Manuals
14. Testing
15. Acceptance Testing
16. Photographic Documentation.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract; including General and Supplementary Conditions, all applicable Division 01 Sections, and all applicable Division Sections; apply to this Section.

B. Section DB 00700 – General Conditions (Design-Build Project Delivery)

C. Section DB 00800 – Supplementary Conditions (Design-Build Project Delivery)

D. Section 00700 – General Conditions (Design-Bid-Build Project Delivery)

E. Section 00800 – Supplementary Conditions (Design-Bid-Build Project Delivery)

F. Section 01000 – General Project Requirements.

G. Section 01015 – Specific Project Requirements.

H. Section 01020 – Record Documents

I. Section 01021 – Operation and Maintenance Data

J. Section 01140.01 - Process and System Shutdown Constraints Schedule

K. Section 01140.02 - Operation Change Control Plan Documents

L. Section 01140 – Work Restrictions

M. Section 01019 – Closeout Procedures

N. Section 01664 - Training

O. Section 01757 – Commissioning

P. Section 01322 – Photographic Documentation.

1.03 CODES AND STANDARDS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

B. American Association of Cost Engineers (AACE):
   1. Comply with recommended practices.

1.04 SUBMITTALS

A. Scheduler Qualifications – For firms and persons preparing schedules, submit qualifications as required by Table 1 to demonstrate their capabilities and experience. Include lists of completed projects with the following information:
   1. Project name.
   2. Project location.
   3. Name and address of engineer, architect or Contractor or Design-Builder for which schedules were prepared.
   4. Name and address of client.
   5. Project Duration at Bid & Project Duration.
   6. Other information and pertinent.

B. Preliminary Schedule of Shop Drawings (Submittals) – Arrange the following information in a tabular format or a format that is compatible with entry into the City's document management system:
   1. Scheduled date for each first submittal.
   2. Specification Section number and title.
   3. Submittal category (action or informational).
   4. Name of subcontractor.
   5. Description of the Work covered.
   6. If a Pre-Submittal Workshop is required
   7. If the Contractor or Design-Builder will request expedited review.
   8. Scheduled date for City's final approval.

C. Standard Schedule Format – Layout for all schedules and reports shall follow the standard format in the following order, activity ID, activity name, original duration, remaining duration, percent complete, start, finish, late start, late finish, total float, baseline variance, predecessor, successor, and resource ID.

D. Preliminary Project Schedule (Design-Build Only) – Submit in native electronic format and *PDF format. PDF sheet size shall sufficiently large enough to legibly show entire schedule for entire construction period.
   1. Include:
      (a) CPM Report
      (b) Native File

E. Baseline Project Schedule – Submit in native electronic format and *PDF format. PDF sheet size shall sufficiently large enough to legibly show entire schedule for entire construction period.
   1. Include:
      (a) CPM Report
      (b) Resource Loaded
      (c) Native File

F. Progress Schedules – Submit in native electronic format and *PDF format. PDF sheet size shall sufficiently large enough to legibly show entire schedule for entire construction period.
   1. Include:
      (a) CPM Report

(b) Activity report
(1) A list of all activities sorted by activity number and early start date, or actual start date, if known.
(c) Logic Report
(1) A list of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
(d) Total Float Report
(1) A list of all activities sorted in ascending order of total float.
(e) Daily Labor Force Report
(f) Material Location Report
(g) Field Condition Report
(h) City may request a cost and resource loaded schedule if the project has insufficient float or multiple overlapping critical paths.

G. Commissioning Schedule Section 01757 - Commissioning
H. Special Reports – Submit special reports within one day of an occurrence.
I. Daily Construction Reports – Submit at weekly intervals.
J. Four Week look ahead – Schedules provided at each progress meeting that indicate with work activities will be occurring over the next 4 weeks and what was accomplished the previous week.
1. The activity designations used in the four week look ahead must be consistent with those used in the baseline schedule and the monthly schedule updates.

1.05 DEFINITIONS
A. Refer to Section 01420 – Definitions and Acronyms.

1.06 COORDINATION
A. Coordinate preparation and processing of schedules and reports with performance of construction activities including the scheduling and reporting of separate Contractor or Design-Builders performing construction activities related to project.
B. Coordinate Progress Schedules with the Schedule of Values, to estimate a Schedule of Monthly Payments, list of subcontractors, Preliminary Schedule of Shop Drawings and Samples, progress reports, Application for Payment, and other required schedules and reports.
C. Secure time commitments for performing critical elements of the Work from parties involved. Time commitments should be captured within the schedule.

1.07 TRAINING SCHEDULE:
A. Contractor Shall provide a draft list of training sessions arranged in chronological order along with the submittal Schedule
B. Contractor shall provide a draft list of training sessions arranged in chronological order along with the submittal schedule.

1.08 Contractor shall send an updated training schedule every 3 months, and Contractor shall indicate which training sessions are tentative or firmly scheduled. SCHEDULE LEVEL
A. If a Recovery Schedule is deemed necessary by the City in accordance with Section 00700 – General Conditions, it shall be developed as a cost and resource loaded schedule.

1.09 SCHEDULING SOFTWARE
A. Prepare schedules using the latest version of Primavera version P6 or higher or Microsoft Project.

1.10 PRELIMINARY SCHEDULE OF SHOP DRAWINGS AND SAMPLES

A. Preparation – Provide a schedule of submittals arranged in chronological order by date required by the construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery as set forth in the Contract Documents, when establishing dates.

B. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, the estimated Schedule of Monthly Payments, and Progress Schedules.

C. Include Shop Drawing and Sample Submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.

D. At Contractor or Design-Builder's option, show submittals on the Preliminary Progress Schedule, instead of tabulating them separately.

1.11 SCHEDULE REQUIREMENTS

A. Requirements According to Schedule Level – Contractor or Design-Builder shall provide the following information.

Item	Requirement
Procedures	Comply with procedures contained the American Association of Cost Engineers (AACE) recommended practices.
Time Frame	Extend project schedule from date established for the Notice to Proceed to the date of Final Completion.
Contract Times	Contract Times shall not be changed unless specifically authorized by Change Order.
Activities	Treat separate major areas as a separate numbered activity for each principal element of the Work. (WBS)
Activity Duration	Define activities so none is longer than 7 days, unless specifically allowed by City
Milestones	Include milestones indicated in the Contract Documents in schedule, including, but not limited to, all zero duration events, the Notice to Proceed, Substantial Completion, and Final Completion.
Computer Software	Prepare schedules using the latest version of Primavera version P6 or higher or Microsoft Project.
Scheduler's Qualifications	Submit scheduler's qualifications for review and approval
Submittal Review Time	Include review and re-submittal times for review of Shop Drawings and Samples. Each item listed in the Preliminary Schedule of Shop Drawings and Samples shall be included in the schedule.
Procurement Activities	Include separate activities for the procurement process of long-lead and major items that require a cycle of more than 30 days or fall within the critical path. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
Startup and Testing Time	See Sections -01757 Commissioning, 01664 Training. Incorporate all these requirements with appropriate lead times into the project schedule.
Phasing	Arrange list of activities on schedule by phase.

Item	Requirement
Submittal Review Time	Include review and re-submittal times for review of Shop Drawings and Samples. Each item listed in the Preliminary Schedule of Shop Drawings and Samples shall be included in the schedule.
City Activities	Include a separate activity for each area of the Work performed by City and a separate activity for notifying the City if contractually required or requested.
Products Ordered in Advance	Include a separate activity for each product. Delivery dates indicated stipulate the earliest possible delivery date.
City-Furnished Products	Include a separate activity for each product. Delivery dates indicated stipulate the earliest possible delivery date.
Work Restrictions	Show the effect of the following items on the schedule: • Coordination with existing construction. • Limitations of continued occupancies. • Uninterruptible services. • Partial utilization before Substantial Completion. • Use of premises restrictions. • Provisions for future construction. • Seasonal variations. • Environmental control.
Work Stages	Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following: • Subcontract awards. • Submittals. • Purchases. • Fabrication. • Sample testing. • Deliveries. • Installation. • Tests and inspections. • Adjusting. • Curing. • Startup and placement into final use.
Area Separations	Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities: • Contractor Mobilization* • Procurement – Divided by Long Lead and Short Lead • Completion of civil work • Completion of structural work • Completion of HVAC work • Completion of architectural work • Completion of mechanical installation • Completion of electrical installation • Completion of I&C installation • Completion of I&C programing • • Partial Utilization • Substantial Completion* • Start of Acceptance Testing • End of Acceptance Testing

Item	Requirement
	• Achievement of Full Operations* • Punch List and Final Corrections* • Final Completion*
Contract Modifications	For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragments to demonstrate the effect of the proposed change on the overall project schedule.
Work under More than One Contract or Subcontract.	Include a separate activity for each contract or subcontract.
Detailed by Work Package	Include detailed information by each work package and display all activities to be accomplished by the workforce with durations of 7 or more calendar days
Detail by Task	Include detail by task to support the short-term planning for the field, normally for those activities of less than 1-week duration.

B. Cost Correlation:
   1. At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.

1.12 PRELIMINARY AND BASELINE PROJECT SCHEDULES

A. Indicate each significant construction activity separately. Identify each Monday of each week with a continuous vertical line. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the Work.
B. Preliminary Network Diagram – Outline significant construction activities for the project. To be submitted with the Preliminary Progress Schedule.
C. Cost Loaded
D. Baseline Schedule shall be resource loaded.

1.13 PROGRESS REPORTS AND SCHEDULES

A. General – Prepare Progress Schedules using a CPM network analysis diagram and be cost loaded.
B. CPM Schedule Preparation – Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths:
   1. Activities – Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
      (a) Preparation and processing of submittals.
      (b) Purchase of materials.
      (c) Delivery of materials and equipment.
      (d) Fabrication.
      (e) Installation.

2. Processing – Process data to produce output data or a computer-drawn, time scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
3. Format – Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges:
   (a) Sub-networks on separate sheets are permissible for activities clearly off the critical path. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 30 days after date established for the Notice to Proceed.
   (b) Establish procedures for monitoring and updating CPM schedule and for reporting progress monthly. Coordinate procedures with progress meeting and payment request dates.
   (c) Use "one calendar day" as the unit of time.
4. Initial Issue of Schedule – Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:
   (a) Contractor or subcontractor and the Work or activity.
   (b) Description of activity.
   (c) Principle events of activity.
   (d) Immediate preceding and succeeding activities.
   (e) Early and late start dates.
   (f) Early and late 'finish dates.
   (g) Activity duration in days.
   (h) Total float or slack time.
   (i) Average size of workforce.
5. Schedule Updating – Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
   (a) Identification of activities that have changed added or deleted.
   (b) Changes in logic ties.
   (c) Changes in early and late start dates.
   (d) Changes in early and late finish dates.
   (e) Changes in activity durations in days.
   (f) Changes in the critical path.
   (g) Changes in total float or slack time.
   (h) Changes in the Contract Time.
6. Value Summaries – Prepare two cumulative value lists, sorted by finish dates:
   (a) In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
   (b) In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
   (c) In subsequent issues of both lists, substitute actual finish dates for activities completed as of last date.
   (d) Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
   (e) In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
   (f) Submit value summary printouts one week before each regularly scheduled progress meeting.

C. Reports:

1. Daily Labor Force Reports – Prepare a daily labor force report recording the following information concerning events at Project site:
   (a) List of subcontractors at Project site.
   (b) List of separate Contractor or Design-Builders at Project site.
   (c) List of all the Contractor or Design-Builder's and subcontractor's personnel showing hours worked in labor class at Project site.
2. Material Location Reports – At monthly intervals, prepare a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
3. Field Condition Reports – Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit electronically and directly to City with a request for information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

D. Special Reports:
1. General – Submit special reports within one day of an occurrence.
2. Reporting Unusual Events – When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events; persons participating; response by Contractor or Design-Builder's personnel; evaluation of results or effects; and similar pertinent information. Advise City in advance when these events are known or predictable.

1.14 SCHEDULE OF VALUES

A. Requirements for Schedule of Values are specified in Article 2.1.3 of the General Conditions.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 PROGRESS SCHEDULES

A. Updates – At monthly intervals, update schedule to reflect actual construction progress and activities. Progress Schedule should be provided for review and approval prior to monthly pay request at a mutually agreed upon date each month to enable the City's review to be complete by the agreed upon monthly pay application date. Progress Schedules will be reviewed and discussed at regularly schedule progress meetings. Contractor or Design-Builder shall bring printed copies of CPM Schedule:
1. Revise schedule immediately after an activity revision has been recognized or made at the direction by the City. Issue updated schedule concurrently with the report of each such progress meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate actual completion percentage for each activity.
4. Post copies in Project meeting rooms and temporary field offices.

3.02 MEETINGS

A. Pre-Commencement Meeting for Design-Build Projects :
   1. In accordance with Article 2.1.1 of the General Conditions, Contractor or Design-Builder shall schedule and conduct a Pre-Commencement Meeting with Owner. This meeting is separate from the Preconstruction Conference and is intended to discuss issues affecting the administration of the Work and to implement the necessary procedures, including those relating to schedules, communication protocols, precise roles and responsibilities of individuals, HRD submittals, and payment, to facilitate the ability of the parties to perform their obligations under the Contract Documents.
   2. Review Payment Procedures as discussed in Contract Documents.
   3. Review scheduling requirements. These include but are not limited to schedule preparation, reporting requirements, manpower and equipment loading, updates, revisions, and schedule delay analysis. Contractor or Design-Builder shall present their schedule methodology, planned sequence of operations, resource loading methodology, and proposed activity coding structure.
   4. Mobilization and Engineering Schedule, Proposed Baseline Schedule, and Proposed Schedule of Values will also be reviewed, if desired by Contractor or Design- Builder.
   5. Minutes: Contractor or Design-Builder shall distribute meeting minutes 1 business day after the meeting.

B. Preconstruction Conference:
   1. Contractor or Design-Builder will schedule the Preconstruction Conference to occur before the start of general construction at a time convenient to Owner. Hold the conference at Project site or another convenient location. If Baseline Schedule is not ready for discussion at Preconstruction Conference, Owner and Contractor or Design- Builder may modify, for the purpose of discussion at the Conference, the Mobilization and Engineering Schedule for early construction activities with defined scope and budget.
      (a) Attendees: Authorized representatives of Owner, Owner's Advisor, Design Professional, Contractor or Design-Builder Key Personnel, major Subcontractors and others as appropriate shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
      (b) Agenda: Discuss items of significance that could affect progress, including the following:
         (1) Owner, Owner's Advisor, Design Professional, and Contractor or Design-Build team member contacts, roles, responsibilities, communication requirements.
         (2) Distribution of Contract Documents.
         (3) Submission of Owner-approved updated Subcontractors and Major Material Suppliers List, Schedule of Values, and Baseline Schedule if changed from Pre-Commencement Meeting
         (4) Schedules and Milestones.
         (5) Contractor or Design-Builder work zone and office trailer locations.
         (6) Procedures: Includes change management, document controls, schedule management, submittals management, and RFIs.
         (7) Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and contract closeout procedures.
         (8) Project Record Document Requirements.
         (9) Review of startup requirements and procedures.
         (10) Lockout/tagout procedures and requirements.

(11) Use of the premises.
(12) Contractor or Design-Builder and Owner will discuss additional areas for Contractor or Design- Builder access.
(13) Responsibility for temporary facilities and controls including designation of person responsible for traffic control in accordance with Section 01500 - Temporary Facilities, and 01700 Traffic Control
(14) Standard vehicle traffic onsite.
(15) Parking availability.
(16) Equipment deliveries and priorities.
(17) OCCPs.
(18) Project site safety requirements (safety vests, OSHA), and first aid.
(19) Plant/site Security/Access Procedures.
(20) Progress cleaning.
(21) Meetings.
(22) Working hours.

(c) Minutes: Contractor or Design-Builder shall record minutes and distribute electronic copies within 1 business days after meeting to participants, with copies to Contractor or Design-Builder, Owner, and those affected by decisions made.

2. Prior to Preconstruction Conference, Contractor or Design-Builder shall have submitted the following deliverables for discussion at meeting:
   (a) Proposed Baseline Schedule.
   (b) Mobilization and Engineering Schedule (modified as discussed above).
   (c) Photo and Video Documentation Plan.
   (d) Construction Safety Plan.
   (e) List of Operational Change Control Plans lasting longer than one week.
   (f) Quality Management Plan.
   (g) Qualifications of Scheduler, Photographer, and any others as required by Specifications.
   (h) And any other deliverables required by Specifications.

C. Monthly Progress Meetings:
   1. Contractor or Design-Builder will schedule and administer formal progress meetings throughout progress of the Work at maximum monthly intervals with the first meeting scheduled approximately 30 calendar days after the Preconstruction Conference.
   2. Contractor or Design-Builder will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.
   3. Contractor or Design-Builder shall provide printed copies of latest submitted progress schedules and Schedule Update.
   4. Attendance Required: Owner, Owner's Advisor, Design Professional, Contractor or Design-Builder's Project Manager, Contractor or Design-Builder's Construction Manager (if different than the Project Manager), as appropriate to agenda topics for each meeting.
   5. Agenda shall be reoccurring and approved by Owner. Topics shall include:
      (a) Review minutes of previous meetings.
      (b) Review of Work progress and future Work.
      (c) Review of safety record/events.
      (d) Risk register/log.
      (e) Change orders.
      (f) Quality control.
      (g) Pay application.
      (h) Schedule reports.

(i) Discuss Stored Material for which the Contractor or Design-Builder will be requesting payment.
(j) Commissioning.

6. Minutes: Contractor or Design-Builder will record changes for update and distribute electronic copies within 7 calendar days after meeting to participants and file on Owner's document management system.

D. Weekly Coordination Meetings:
1. Upon start of construction, Contractor or Design-Builder will schedule and administer meetings throughout progress of the Work at maximum weekly intervals.
2. Contractor or Design-Builder will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.
3. Attendance Required: Owner, Owner's Advisor, Design Professional, Contractor or Design-Builder's Project Manager, Contractor or Design-Builder's Construction Manager (if different than the Project Manager), Commissioning Manager, superintendents, major subcontractors and suppliers as appropriate to agenda topics for each meeting.
4. Agenda:
(a) Review of Work progress.
(b) Field observations, problems, and decisions.
(c) Identification of problems delaying planned progress, hazards and risks.
(d) Review of critical submittals.
(e) Deviations in the previous week's 4-Week Schedule.
(f) Review of critical RFIs, change documents, issues and action items.
(g) Review of upcoming OCCPs within 3-week window.
(h) Review of offsite fabrication and delivery schedules.
(i) Maintenance of Baseline Schedule.
(j) Corrective measures to regain projected schedules.
(k) Review 5-Week Schedule and planned progress during succeeding work period.
(l) Schedule Update, if required in accordance with Paragraph 3.02.
(m) Coordination of projected progress.
(n) Maintenance of quality and work standards.
(o) Effect of proposed changes on Baseline Schedule and coordination.
(p) Any requests for stored materials payment
(q) Other business relating to Work.
5. Contractor or Design-Builder will record minutes and distribute electronic copies within 1 calendar day after meeting to participants and those affected by decisions made.

E. Daily Coordination Meeting: Upon start of construction, Contractor or Design-Builder shall hold daily informal meetings with the Owner to discuss planned daily activities by the Contractor or Design-Build team and Owner staff. Owner may elect to merge this meeting with the Division's regular morning meetings.

F. OCCP Coordination Meetings:
1. Contractor or Design-Builder shall schedule and coordinate with Owner one-week prior to implementation of approved OCCP.
2. Agenda:
(a) Review Approved OCCP.
(b) Review safety requirements and preparations.
(c) Review contingency plans.
(d) Confirm resource availability for execution of OCCP.
3. Contractor or Design-Builder may request and coordinate additional meetings with Owner as necessary to facilitate completion and approval of draft OCCPs. Owner will make

reasonable effort to accommodate Contractor or Design-Builder but prefers minimum one week notice.

G. Pre-Installation Conferences:
   1. Conduct a Pre-Installation Conference at Project site before each construction activity that requires coordination with other construction or moving heavy equipment within reach of the railroad. Work around railroads shall be coordinated in accordance with Section OR-01500 - Temporary Facilities.
   2. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Owner of scheduled meeting dates.
   3. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
      (a) Contract Documents.
      (b) Options.
      (c) Related Change Orders.
      (d) Purchases.
      (e) Deliveries.
      (f) Submittals.
      (g) Possible conflicts.
      (h) Compatibility problems.
      (i) Time schedules.
      (j) Weather limitations.
      (k) Manufacturer's written recommendations.
      (l) Warranty requirements.
      (m) Compatibility of materials.
      (n) Acceptability of substrates.
      (o) Temporary facilities and controls.
      (p) OCCPs.
      (q) Space and access limitations.
      (r) Regulations of authorities having jurisdiction.
      (s) Testing and inspecting requirements.
      (t) Required performance results.
      (u) Protection of construction and personnel.
   4. Record significant conference discussions, agreements, and disagreements.
   5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

H. Expedited Submittal Review Meetings: To expedite the submittal process and accelerate the delivery schedule for equipment with long delivery lead times, expedited submittal review meetings may will need to be held for equipment identified by the Contractor or Design-Builder. Contractor or Design-Builder shall identify such meetings on Baseline Construction Schedule and coordinate the meetings as needed.

I. Required Submittal Review Meetings: Work in the following Specifications shall require a workshop prior to submittals in order to streamline the review process.
   (a) Section 13384 – Configuration of HMI Software including a standards and conventions workshop, draft graphics review meeting and field testing coordination meeting.
   (b) Section 11330 - Mechanical Bar Screens

(c) Section 16134 - Medium-Voltage, Metal-Clad Switchgear
(d) Section 1648 - Low Voltage Motor Control Centers
(e) Section 16113 – Secondary Unit Substations with Switchboards Secondary

J. Other Meetings as Required:
1. Maintenance Workshop(s):
   (a) Purpose: Develop the work orders for new and modified assets with the Owner. Contractor or Design-Builder shall review Original Equipment Manufacturer (OEM) O&M manual maintenance recommendations with Owner. Maintenance activities (Preventive & Predictive) will be divided between operations and maintenance. The updated round sheets for the site(s) will be reviewed for deficiencies. Contractor or Design-Builder shall facilitate a discussion of which OEM recommended maintenance activities have value after the warranty period. If necessary, the Contractor or Design-Builder and Owner will develop additional maintenance activities not recommended by the OEM with a particular focus on predictive maintenance activities such as vibration testing, lubricant testing, and IR testing to support the Owner's reliability centered maintenance program. Maintenance activity frequency will also be discussed. Lubrication for assets will be discussed with a focus on minimizing new lubricants that will need to be stocked.
   (b) Scheduling: Meetings shall occur after OEM manuals have submitted and approved.
2. Sequence of Operations Meeting(s):
   (a) Schedule: During design, after draft sequence of operations are completed.
   (b) Purpose: Walk Owner's operations staff and engineering staff through the proposed sequences of operation to control equipment and processes and solicit comments and refinements.
3. Facility Data Workshop:
   (a) Purpose: Any points communicated to a PLC and not SCADA will be discussed. Alarm set point and priority will be reviewed and developed. Historian settings for each point will also be developed or reviewed.
   (b) Scheduling: After draft sequence of operations is completed and finalized PIDs.
4. O&M Data Meeting
   (a) 90 days prior to Substantial Completion, a meeting will be held to discuss the steps to prepare the O&M Data for transmittal to the City.
5. Spare Parts Coordination Meeting
6. Commissioning meetings as required in Section 01757 - Commissioning.

END OF SECTION

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

DAILY FIELD OBSERVATION REPORT

Project Number _____

Project Title _____

Contractor _____

Report Number _____ Date _____ Time _____

Weather			Site Conditions		Day	
❑ Clear	❑ Snow	❑ Warm	❑ Clear	❑ Dusty	❑ Monday	❑ Thursday
❑ Overcast	❑ Foggy	❑ Hot	❑ Muddy	❑ _____	❑ Tuesday	❑ Friday
❑ Rain	❑ Cold	❑ Temperature Range _____			❑ Wednesday	❑ _____

Persons Contacted:

Work Observed:

Items Discussed:

Materials Delivered:

Requested Revisions or Interpretations:

Nonconforming Work Reported This Date To Contractor:

Remarks:

❑ Attachments

Signed by: Date:

Distribution:
- ❑ Owner
- ❑ Contractor
- ❑ Construction Manager
- ❑ Design Professional
- ❑ Consultant _____
- ❑ Other _____

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

PERIODIC FIELD OBSERVATION REPORT

Project Number _____

Project Title _____

Contractor _____

Report Number _____ Date _____ Time _____

Weather			Site Conditions		Day	
❑ Clear	❑ Snow	❑ Warm	❑ Clear	❑ Dusty	❑ Monday	❑ Thursday
❑ Overcast	❑ Foggy	❑ Hot	❑ Muddy	❑ _____	❑ Tuesday	❑ Friday
❑ Rain	❑ Cold	❑ Temperature Range _____			❑ Wednesday	❑ _____

Persons Contacted:

Work Observed:

Items Discussed:

Remarks:

❑ Attachments

Signed by: Date:

Distribution:
- ❑ Owner
- ❑ Contractor
- ❑ Construction Manager
- ❑ Design Professional
- ❑ Consultant _____
- ❑ Other _____

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

WEEKLY REPORT OF WORKING DAYS

Project Number _____

Project Title _____

Contractor _____

Report Number _____ Week Ending: _____

DATE:	WORKING DAY	REMARKS

TOTAL THIS WEEK	PREVIOUSLY	TOTAL TO DATE	WORKING DAYS IN CONTRACT	REMAINING OR OVERTIME

Signed by OWNER'S REPRESENTATIVE Date:

Signed by CONTRACTOR Date:

Distribution: ❑ OWNER ❑ CONTRACTOR ❑ Construction Manager ❑ Design Professional ❑ Consultant ❑ Other

SECTION 01322 – PHOTOGRAPHIC AND VIDEO DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

A. This Section outlines the requirements for photographic and video documentation. The Contractor/Design-Builder is solely responsible for the development of an overall plan to fully document Site conditions and the progress of the Work.

B. The Contractor/Design-Builder shall hire a professional photographer to provide the services and deliverables described herein.

C. This section does not include work associated with internal closed-circuit television (CCTV) inspections of sewer gravity pipes. See Section 02686 – CCTV Inspection of Sewer Mains.

1.02 RELATED SECTIONS

A. Section DB 00700 – General Conditions (Design-Build Project Delivery)
B. Section DB 00800 – Supplementary Conditions (Design-Build Project Delivery)
C. Section 00700 – General Conditions (Design-Bid-Build Project Delivery)
D. Section 00800 – Supplementary Conditions (Design-Bid-Build Project Delivery)
E. Section 01015 – Specific Project Requirements.
F. Section 01300 – Submittals.
G. Section 01019 – Closeout Procedures
H. Section 01021 - Operation and Maintenance Data
I. Section 01664 – Training
J. Section 01757 - Commissioning
K. Section 01320 – Construction Progress Documentation.
L. Section 01335 – Document Management.
M. Section 02686 – CCTV Inspection of Sewer Mains.

1.03 DEFINITIONS

A. Pre-Construction Video: A video taken to document Site(s) conditions prior to the start of construction.

B. Pre-Construction Photographs: 360 Degree photographs taken to document Site conditions prior to the start of construction. All Pre-Construction Photographs shall be digital, indexed on an interactive map and shown on a View Location Map.

C. Construction Progress Photographs: 360 Degree digital photographs taken to document the progress of construction.

D. Construction Activity Photographs: Digital photographs taken to document specific construction activities.

E. Post-Construction Photographs: Digital photographs taken after final restoration to document the finished condition of the Site.

F. Record Photographs: Digital Photographs of all assets effected by the project. Photos taken after Substantial Completion are preferred for assets that are visible then obscured by the project. Assets obscured during the project will have their record photos taken as needed throughout the project.

G. Affidavit of Authenticity: The photographer's signed and notarized affidavit, attesting to the production of the original photographs, videos and their authenticity.

1.04 SUBMITTALS

A. Submit as specified in Section 01300 – Submittals.

B. Other required Submittals:
   1. Photographer's Qualifications: Submit for review and approval the qualification information demonstrating the photographer meets the requirements of paragraph 1.06 of this Section.
   2. Phasing Plan: If applicable, submit for review and approval a phasing plan for Pre-Construction Photographs and Videos.
   3. Pre-Construction Photographs: Submit for review and approval digital pre-construction photographs with an interactive index map, Photograph Navigation System (see paragraph 2.05 of this Section) and affidavit of authenticity.
   4. Pre-Construction Video: Submit for review and approval a pre-construction video with a Video Navigation System (see paragraph 2.05 of this Section) and affidavit of authenticity (see paragraph 1.04 of this Section).
   5. Construction Progress Photographs: On a monthly basis, submit digital construction photographs, interactive index map and affidavit of authenticity.
   6. Construction Activity Photographs: On a monthly basis, submit digital activity photographs (if different than progress photographs), interactive index map and affidavit of authenticity.
   7. Record Photographs: Maintain an active directory of tagged Record Photographs by asset.
   8. Post-Construction Photographs/Video: Submit for review and approval digital post-construction photographs or video, interactive index map and affidavit of authenticity.

1.05 QUALITY ASSURANCE

A. The Contractor/Design-Builder is responsible for the quality assurance and quality control of the Work.
B. General Quality: Photographs and video shall be clear and of sufficient quality to show relevant detail. They shall not be blurred, taken in shadow or too far away to provide conclusive information. The City may require that the photographs or video be retaken should the quality be insufficient. Costs for such re-takes are the Contractor/Design-Builder's sole responsibility and shall be done at no extra cost to the City.
C. Qualifications of Photographer: The Contractor/Design-Builder shall engage the services of a professional photographer with a minimum of 3 years of experience in construction photography to document the conditions of the project site. Upon request, samples of the photographer's prior work and/or references shall be submitted.
D. Affidavit of Authenticity: The Contractor/Design-Builder shall provide the photographer's signed and notarized affidavit, attesting to the production of the original photographs, videos and their authenticity. An affidavit of authenticity shall be provided with each submittal/deliverable.

1.06 MINIMUM REQUIREMENTS

A. The section specifies several different sets of photographic and video documentation requirements. The extent of documentation will depend upon the size and type of the project. The following table summarizes the basic documentation requirements.

Set of Documentation	Mandatory
Pre-Construction Video	✓
Pre-Construction Photographs	✓
Interactive Index Map	✓

Set of Documentation	Mandatory
Construction Progress/Activity Photographs	✓
Record Photos	✓
Post-Construction Photographs/Video	✓

1.07 OWNERSHIP

A. The photographs and videos shall become the sole property of the City.

1.08 SCHEDULES

A. Schedule of Values: Photographic/Video documentation shall be listed as one line item in the Schedule of Values.
B. Construction Progress Documentation: Each set of photographs or videos shall be listed in the Preliminary Project Schedule as a discrete activity. See Section 01320 – Construction Progress Documentation.

1.09 PHASING

A. Based on the nature and scope of the Work, the Contractor/Design-Builder may phase the Pre-Construction Photographs and Video if pre-approved by the City's Representative. If phasing is to be implemented, the following shall apply:
   1. The Contractor/Design-Builder shall submit a Phasing Plan that identifies each area of the Work.
   2. For each phase, Pre-Construction Photographs and Videos shall be taken within 21 days of the start of construction activities unless otherwise approved in writing by the City's Representative.
B. Under no circumstances shall construction begin in any area until the Pre-Construction Photographs and/or Video have been submitted and approved by the City or Designee.

PART 2 - PRODUCTS

2.01 PHOTOGRAPH QUALITY

A. Photographic images shall be captured in digital format, with a minimum of 10-megapixel resolution and taken without JPG compression.
B. Each photograph shall include a date/time stamp in the image, showing when the image was taken.

2.02 VIDEO QUALITY

A. All video recordings shall be captured in full 1080-dpi Hi-Definition digital format, without compression or file-reduction whether applied in-camera or after capture during editing.
B. The original video segments shall be retained in the format captured in camera (such as MP4) without compression or modification that would reduce resolution or quality. The video shall include a date/time stamp in the image, showing when the image was taken. Video shall include verbal description and narrative of what is being captured.

2.03 METADATA

A. Digital files for photographs (Non-Record Photos) and videos shall, at a minimum, contain the following metadata:
   1. Project Name.

2. Project Area
3. Date and Time Taken.
4. All other metadata inherently provided by the camera/video equipment.

B. Record Photos shall be metadata tagged per the City's Record File Tagging.

2.04 MEDIA LOG

A. The Contractor/Design-Builder shall maintain a media log (photographs and videos) for the project. The log shall include, but is not limited to, the following information for each photograph and/or video:
1. Project Name.
2. Project Number.
3. Contract Number.
4. Name of City and Department.
5. Name of Contractor/Design-Builder.
6. Name of Design Professional.
7. Photograph file name (the specific format should be tied to the project name). Photograph file name shall be unique to each digital file and shall be embedded in the digital image in a manner that is permanent and clearly legible when the file is opened.
8. Include a date designator in file names.
9. Date the photograph was taken.
10. The name of the photographer who took the photograph.

2.05 PHOTOGRAPH AND VIDEO NAVIGATION SYSTEM

A. The Contractor/Design-Builder shall provide an electronic photographic and video navigation system (navigation system) for searching and viewing recorded imagery.

B. Interactive Index Map: The navigation system shall indicate the general location of each area photographed or video recorded using icons and other suitable mark-ups on the actual construction drawings in PDF-format. The map shall be filterable by project area, system, and sub-system.

C. The navigation system shall utilize standard PDF-reader software (such as Adobe Reader, Acrobat, or Bluebeam Vu) or other software that shall be included with the deliverables. Icons shall be individually hyperlinked to the respective photograph, video, affidavit of authenticity and media log file for immediate playback in Windows Media Player, VLC or other players.

D. The navigation system shall include the following:
1. Project Name.
2. Project Number.
3. Contract Number.
4. Name of City.
5. Name of Contractor/Design-Builder.
6. Name of Design Professional.
7. Ranges of dates for which the photographs or videos were taken.
8. Facility
9. System
10. Sub-System
11. Asset if intelligible
12. The name of the photographer.
13. Affidavit of Authenticity.
14. Media Log.
15. Photographs.

16. Videos.

E. A navigation system shall be provided for each set of photographs and videos taken.

PART 3 - EXECUTION

3.01 PRIOR TO PHOTOGRAPHIC AND VIDEO DOCUMENTATION

A. Construction Limits: Prior to the Pre-Construction Photographs and Video, the Contractor/Design-Builder shall flag or mark the construction limits and excavation.

B. Mark Utilities: Prior to the Pre-Construction Photographs or Video, the Contractor/Design-Builder shall notify utilities and have them marked so that utility locations are documented.

C. Coordinate with City to be present during the Pre-Construction Photos; the Contractor/Design-Builder shall provide the City a minimum of 2 days' notice.

3.02 PRE-CONSTRUCTION VIDEO

A. Scope: Prior to the start of construction, the Contractor/Design-Builder shall prepare a color video recording with audio of all the areas to be affected by construction. All pre-construction video recordings shall have sufficient detail to reveal the condition (including defects and damage) of all existing features, such as pavement, driveways, culverts, inlets, sidewalks, landscaping, vegetation, creek banks, trees, structures, foundations and other such items along the construction route and in the immediate adjacent areas, which might be affected by the construction operations. In addition, the videographer shall move beyond the construction zone as needed to ensure documentation of features and areas that may not be adequately recorded from the centerline rotations. Videos shall be taken on both sides of the street when construction is in or along a roadway (use this approach along drainage channels and in other similar situations).

B. Schedule: Taken after utilities and other underground structures/assets have been marked and prior to the placement of materials or equipment on the Site. Videos shall be submitted to the City for review and approval. Under no circumstances shall construction begin until the pre-construction video has been submitted and approved.

C. The pre-construction video recording shall be done in the presence of a representative of the City.

D. The Contractor/Design-Builder shall document all pre-existing site conditions/elements of the Site, the same as listed for the Pre-construction Photographs.

E. The video documentation shall provide a clear and continuous view of the project showing all visible utilities and features within the limits of construction.

F. To preclude the possibility of tampering or editing in any manner, all video recordings shall, by electronic means, generate and display continuously and simultaneously on the screen or in the video file metadata properties digital information to include the date and time of recording. The time information shall consist of hours, minutes and seconds, separated by colons (i.e., 10:35:18).

G. The audio/video recording shall consist of one video and one audio track which shall be recorded simultaneously. All tracks shall consist of the original live recordings and thus shall not be copies of other audio or video recordings.

H. The audio track shall contain the narrative commentary. Ample descriptive narrative shall be recorded simultaneously during all recordings. Narration shall include clearly audible comments that will deliver station number and/or street address, locations, direction of view and rotation.

I. Typical video segments should not exceed 10 minutes in length.

J. Rotations of 360-degrees shall be at all locations being photographed and necessary to see all site conditions.
K. Panning rate, zoom-in rate and zoom-out rate shall be controlled sufficiently such that playback will provide clarity of the object viewed.
L. All recording shall be done during times of good visibility. No recording shall be done during periods of precipitation unless authorized by the City.

3.03 PRE-CONSTRUCTION PHOTOGRAPHS

A. Scope: The purpose for pre-construction photo documentation is to record existing conditions, damage and features on or adjacent to the project site. The principal reason for obtaining photographs is so that existing conditions located in the Project Site may be clearly shown and documented in the event of a dispute. Contractor is required to notify the City within 2 weeks if the Pre-Construction Video or Photographs differ from the bid documents.
B. Schedule: Take photographs after underground assets and utilities have been marked, prior to placement of materials or equipment on the Site and prior to the start of construction activities in an area. Photographs shall be submitted to the City for review and approval. Construction shall not begin until the pre-construction photographs have been submitted and approved.
C. Pre-construction photographs shall be taken at sufficient intervals to be able to carefully document the pre-construction conditions of the Site before commencement of the Work. Photos shall be 360 views.
D. In addition, select photographs shall be taken as needed along the construction limits.
E. Overlapping composition techniques shall be employed to ensure maximum photographic coverage.
F. Pre-construction photographs shall be taken after underground utilities and assets have been marked.
G. Pre-construction photographs shall be taken with a representative of the City present unless otherwise authorized by the City.
H. All Pre-Construction Photographs shall have sufficient detail to reveal the condition (including defects and damage) of all existing features.
I. Pre-Construction Photos shall have an overlapping 360 view of the project area inside and outside structures/buildings.
    1. Views of structures, both inside and adjacent to the ROW/easement in areas where the Contractor/Design-Builder will be working within five (5) feet of said structure.
    2. Other views as requested by the City.

3.04 CONSTRUCTION PROGRESS PHOTOGRAPHS

A. Scope: The Contractor/Design-Builder shall provide construction progress photographs to depict the progress of the work. The Contractor/Design-Builder shall be responsible for photographs of the Site to show the existing and general progress of the Work. The City will advise as to which views are of interest.
B. Schedule: Photographs shall be taken at the time of the Pre-construction Photographs, a minimum of once per month throughout the duration of the Project, and at the time of the Post Construction Photographs. Construction Progress Photographs are to be submitted each month with the Contractor/Design-Builder's Application for Payment.
C. This set of photographs will be taken as close as possible to the same locations and views of the pre-construction photography.

3.05 CONSTRUCTION ACTIVITY PHOTOGRAPHS

A. Scope: The Contractor/Design-Builder shall provide photographs taken to document Site conditions and specific construction activities throughout the duration of the Project.
B. Schedule: Photographs shall be taken two times per month (every two weeks) for the duration of the Project.
C. Construction Activity Photographs are to be submitted each month with the Contractor/Design-Builder's Application for Payment.
D. Photographs shall be taken to depict the work accomplished during the month. These photographs are to include, but are not limited to, the following:
    1. Work not yet obscured.
    2. All assets that will be obscured by future work shall be photographed after work on the asset is completed and prior to the asset being obscured.
    3. When mechanical, electrical, plumbing or building inspections are scheduled.
    4. The beginning of installation of major items of equipment.
    5. After installation of major items of equipment.
    6. Other significant construction activities.
    7. As directed by the City.

3.06 POST-CONSTRUCTION PHOTOGRAPHS

A. Scope: The Contractor/Design-Builder shall provide Post-Construction Photographs of the project area that documents the final restoration and construction improvements. Post-Construction photographs shall show the general condition of the construction zone (recording finished landscape and other restoration, plus construction improvements), and other areas that may have been affected by construction activities.
B. Schedule
    1. Photographs shall be taken after completion of the Substantial Completion punch list when the project is complete, the Site is restored to the satisfaction of the City, and before submission of the Application for Final Payment.
    2. Post-construction photographs shall be taken after all items have been address from the Substantial Completion inspection, after cleanup and site restoration, and before application for final payment.
C. Post-Construction Photographs are to be submitted with the Contractor/Design-Builder's Application for Final Payment.
D. The Contractor/Design-Builder shall coordinate the schedule of the post-construction photographs with the City's Project Manager and shall provide at least 5 days written notice to allow the City's Representative to be present when the photographs are taken.

3.07 POST-CONSTRUCTION VIDEO

A. Scope: The Contractor/Design-Builder shall prepare a color video recording with audio of all the areas affected by construction. All Post-Construction video recordings shall have sufficient detail to reveal the final, restored condition of all existing assets and in the immediate adjacent areas, which might have been affected by the construction operations. In addition, videographer shall move beyond the construction zone as needed to ensure documentation of features and areas that may not be adequately recorded.
B. Schedule: The post-construction video shall be taken in conjunction with the post-construction photographs.
C. Post-construction videos are to be submitted with the Contractor/Design-Builder's Application for Final Payment.
D. Unless otherwise authorized by the City, the post-construction video recording shall be done with a representative of the City present.

E. The Contractor/Design-Builder shall document all post-construction site conditions/elements of the Site as listed for the post-construction Photographs.
F. The video documentation shall provide a clear and continuous view of the project alignment showing all visible utilities and features within the limits of construction.
G. To preclude the possibility of tampering or editing in any manner, all video recordings shall, by electronic means, generate and display continuously and simultaneously on the screen digital information to include the date and time of recording. The time information shall consist of hours, minutes and seconds, separated by colons (i.e., 10:35:18).
H. The audio video recording shall consist of one video and one audio track which shall be recorded simultaneously. All tracks shall consist of original live recordings and thus shall not be copies of other audio and video recordings.
I. The audio track shall contain the narrative commentary. Ample descriptive narrative shall be recorded simultaneously during all recordings. Narration shall include clearly audible comments that will deliver station number and/or street address locations, direction of view and rotation.
J. Typical video segments should not exceed 10 minutes in length.

3.08 RECORD PHOTGRAPHS

A. Scope: Record photographs are a subset of post-construction and construction progress photos that give a view of an effected, modified, updated, or new asset in a project.
B. The photos are to be post-construction photos wherever practical. Construction Progress Photos shall be utilized when an asset will be obstructed by later portions of the project.
C. Record Photos shall be taken of the asset from every feasible angle.
D. All Record Photos shall be tagged per City Record File Tagging Standards.

3.09 DELIVERABLES

A. Delivery of the documentation record shall be made as soon as is practical after the images are recorded. Deliverables include original photographs in JPG format, photographs converted to pdf format, interactive map index and navigation system.
B. Electronic Storage Devices: Submit the navigation system on a non-returnable USB compatible flash drive. Submittals shall conform to the following:
    1. Submit with the monthly invoice two sets of digital photographs and/or videos. Each set shall be contained on a separate electronic storage device.
    2. Each set shall be cumulative of all photographs and/or videos taken to date.
    3. Affidavit(s) of Authenticity shall be included in a digital format.
C. Document Management System: Unless otherwise noted in Section 01015 – Specific Project Requirements, all deliverables shall be provided in an electronic format using the specified document management system and in accordance with paragraph 1.05 of this Section.

END OF SECTION

SECTION 01329 – SAFETY PLAN

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes the development and maintenance of a Construction Safety Plan.

1.02 REFERENCES

A. National Fire Protection Association (NFPA):
    1. 70E - Standard for Electrical Safety in the Workplace.
B. Occupational Safety and Health Administration (OSHA).
C. Section 01300 Submittal Procedures.

1.03 CONSTRUCTION SAFETY PLAN

A. Detail the Methods and Procedures to comply with NFPA 70E, Federal, and Local Health and Safety Laws, Rules and Requirements for the duration of the Contract Times. Include reference to and comply with latest Owner safety policies. Include the following:
    1. Identification of the Certified or Licensed Safety Consultant (Safety Officer) who will prepare, initiate, maintain and supervise safety programs, and procedures.
    2. Procedures for providing workers with an awareness of safety and health hazards expected to be encountered over the course of construction.
    3. Safety equipment appropriate to the safety and health hazards expected to be encountered during construction including hydrogen sulfide (H2S), asbestos, and lead. Include warning devices, barricades, safety equipment in public right-of-way and protected areas, safety equipment used in multi-level structures, and personal protective equipment (PPE) as required by NFPA 70E.
    4. Methods for minimizing employees' exposure to safety and health hazards expected during construction including entrance to tanks, such as digesters, and confined spaces used in the operation of the treatment plant and demolition.
    5. Procedures for reporting safety or health hazards.
    6. Procedures to follow to correct a recognized safety and health hazard.
    7. Procedures for investigation of accidents, injuries, illnesses, and unusual events that have occurred at the construction site.
    8. Periodic and scheduled inspections of general work areas and specific workstations.
    9. Training for employees and workers at the jobsite.
    10. Methods of communication of safe working conditions, work practices and required personal protection equipment.
    11. Provision of a site-specific emergency action and evacuation plan during normal operations as well as when site access is blocked by trains.
B. Submit draft Safety Plan to Owner in accordance to Section 01300 Submittal Procedures for review prior to the Pre-Construction Meeting. The Safety Plan shall be a discussion topic on the agenda for the Pre-Construction Meeting. Following the Pre-Construction Meeting, Design-Builder shall submit final Safety Plan for Owner review within two weeks.

C. Design-Builder Assume assumes sole responsibility for every aspect of Health and Safety on the jobsite, including the health and safety of subcontractors, suppliers, and other persons on the jobsite:
    1. Forward available information and reports to the Safety Consultant Officer who shall make the necessary recommendations concerning worker health and safety at the jobsite.
    2. Employ additional health and safety measures specified by the Safety Consultant Officer, as necessary, for workers in accordance with OSHA guidelines.
D. Timely Transmit to Owner and Engineer copies of reports and other documents related to accidents or injuries encountered during construction in accordance with Section 01300 Submittal Procedures.
E. Smoking
    1. There is no smoking allowed in buildings or within 50 feet of Digesters and NFPA classified areas and envelopes.
    2. No smoking will be allowed in facilities once they are closed in.
    3. No smoking will be permitted anywhere on the site following delivery of chemicals.
    4. Smoking is only allowed in Owner designated areas.
    5. Design-Builder shall provide signage identifying designated smoking areas, and when any changes to the designated areas are made.
    6. Design-Builder will be responsible for cleaning up cigarette butts..

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

End of Section

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

TRANSMITTAL LETTER

Project Number _____

Project Title _____

Date _____

TO: _____ Re: _____

_____ _____

_____ _____

_____ _____

ATTN: _____ _____

We are sending you ❑ Attached ❑ Under separate cover via _____ the following items:

❑ Shop Drawings ❑ Prints ❑ Drawings ❑ Samples ❑ Specifications

❑ Copy of Letter ❑ Change Order ❑ _____

Copies	Date	No.	Description

These are transmitted as checked below:

❑ For Approval ❑ Approved as Submitted ❑ Resubmit _____ Copies for Approval

❑ For Your Use ❑ Approved as Noted ❑ Submit _____ Copies for Distribution

❑ As Requested ❑ Returned for Corrections ❑ Return _____ Corrected Prints

❑ For Review and Comment ❑ _____

Remarks: _____

By: _____

Distribution:

❑ Owner
❑ Contractor
❑ Construction Manager
❑ Design Professional
❑ Consultant
❑ Other

SECTION 01335 –DOCUMENT MANAGEMENT

PART 1 - GENERAL

1.01 SUMMARY

A. An internet-based coordination and document management systems (DMS), e-builder & B2G, will be used for the Project. This system will be used to manage project documentation among the City (and/or Designee) , Contractor (or Design-Builder) and Engineer of Record. The Contractor or Design-Builder shall utilize the document management system for all project related correspondence and documentation.

B. The DMS will be utilized to create, track and organize project documentation (City's Representative will provide the exceptions), including, but not limited to, the following:
   1. Schedules.
   2. Applications for Payment.
   3. Meeting minutes with action items.
   4. Project correspondence.
   5. Shop Drawing and Sample(s) Submittals.
   6. Transmittals.
   7. Change Management:
      (a) General Contractor Requests for Interpretation.
      (b) Proposal Requests.
      (c) Work Change Directives. (Storage only)
      (d) Change Orders.
   8. Reporting:
      (a) Certified Payroll Report. (B2G)
      (b) Subcontractors and Major Material Suppliers List. (B2G)
      (c) Daily Labor Force Reports. (B2G)
      (d) Daily Inspection Reports.
      (e) Photographs and Video.
      (f) Certificate of Achievement of Full Operation.
      (g) Contractor Affidavit for Final Payment.
      (h) Subcontractor Affidavit for Final Payment.
      (i) Punch Lists.
   9. Notifications:
      (a) Correction of Defective Work.
      (b) Notification of Non-Compliant Work.

1.02 RELATED SECTIONS

A. Section DB 00700 – General Conditions (Design-Build Project Delivery)
B. Section DB 00800 – Supplementary Conditions (Design-Build Project Delivery)
C. Section 00700 – General Conditions (Design-Bid-Build Project Delivery)
D. Section 00800 – Supplementary Conditions (Design-Bid-Build Project Delivery)
E. Section 01015 – Specific Project Requirements.
F. Section 01300 – Submittals.

1.03 COORDINATION MEETING

A. Prior to the pre-construction conference, the City will facilitate a meeting with the Contractor or Design-Builder to review requirements for project coordination, document control and use of the DMS. The meeting should be scheduled to allow the Contractor or Design-Builder time to submit the initial project correspondence, other requirements and preliminary schedules in accordance with Section 00700-General Conditions.
B. At this meeting, the City will present the procedures to be used for document management for the Project.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01340 - PROJECT BIM COORDINATION

PART 1 - GENERAL

1.01 SUMMARY OF WORK

A. This section covers Building Information Modeling (BIM) enabled projects.

1.02 Related Sections

A. 01000 – General Requirements
B. 01019 – Closeout Procedures
C. 01615 – Equipment Identification & Tagging
D. 01340.A - Attributes
E. Kansas City Water Services Department Design Standards – CAD Drawing Standards

1.03 CODES AND SECTIONS

A. Not Applicable

1.04 DEFINITIONS

A. General Definitions
    1. BIM – Building Information Model
    2. Design Phase – The overall design is broken into separate stages. Each phase is a certain level of development.
    3. LIDAR - This is an acronym for Light Detection and Ranging. This method measures distances using laser light and measuring the reflection with a sensor. This is also called 3-D Laser Scanning.
    4. Modeled Object – An equipment asset created in BIM. Modeled objects are tagged using a parent-child-grandchild data structure with CMMS tag level 6 is the parent, CMMS tag level 7 is the child, CMMS tag level 8 is the grandchild. The grandchild inherits data from the child and the child inherits data from the parent.
    5. Overlay – Placing an object over the surface of another of another object thus allowing the object to be visible on drawings or other deliverables by viewer.
    6. Point Cloud - A set of data points in space used for capturing existing conditions of any site.
    7. Relative File Path – a defined location relative to BIM's current directory
    8. Site Types
        a. Brownfield – Project locations with hazardous materials at in existing in-use facilities by City.
        b. Grayfield - Project locations with existing in-use facilities by City.
        c. Greenfield – Project locations with no in-use facilities by City.
    9. Standard Component – Any valve, pipe, duct, fitting, cable, cable tray, conduit, wiring, or structural member where aforementioned component is dimensionally defined in a Design Standard.
    10. State Plane Coordinate System – U.S. Coordinate system used by each U.S. state and has between one to six zones depending on size and shape.
B. Software Definitions

1. Software Packages
    a. BIM 360 – Autodesk BIM software that shows the latest published Revit 3D models for design collaboration between Owner and Contractors.
    b. CMMS – Computerized Maintenance Management System used for operation and maintenance of facility assets. CITY's current CMMS is Hansen Infor™.
    c. Revit – Autodesk software used for Building design, Foundation design, Structural design, and MEP design.
2. CMMS
    a. CMMS Parameters – Fields within Autodesk Revit associated with identifying and describing an asset or equipment item. These fields allow for the creation of unique identifiers for each piece of equipment, and allowing for synching with CITY's CMMS. Refer to Section 013124.A – BIM Attributes.
    b. CMMS Synching – Process that integrates the BIM model with CMMS.
3. CMMS Facility Key – Unique identifier used in City's asset management system. The asset management system relies on this unique identifier to incorporate all information collected into the asset management system. This may hereinafter also be referred to as the Comp Key.
4. Dynamic – Any item, field, attribute, or other component which receives an active input from a source other than by a manual user.
5. Parameter – Fields with populated values in BIM modeling software. In Autodesk Revit, these are commonly referred to as family parameters.
6. Publish – The process of pushing any model changes into cloud-based BIM software for the purpose of coordination between interdisciplinary and inter-organizational teams
7. Static – Any item, field, attribute, or other component which requires manual edit to change its value.

1.05 BIM INFORMATION PROVIDED BY OWNER

A. Existing
    1. Existing survey information, GIS data, 2D drawing documents, and existing BIM models will be shared with BIM responsible person(s).
    2. Non-available information will be determined prior to commencing any site visits. If needed, non-available information will be collected while on site and incorporated into the BIM model. Site visits may also identify any additional information needed for completion of Work and needed to be included in the BIM model.
    3. CITY may provide a template from Revit, or BIM 360 before commencement of Work by Design Professional.
    4. CITY encourages the use of LIDAR for documenting conditions due to increased efficiency over other methods.
    5. CITY will provide CMMS Facility Key information for existing assets in CMMS.

1.06 BIM INFORMATION PROVIDED BY DP

A. General
    1. All BIM-related design shall be performed in Autodesk Revit.

a. Prior to commencing Work, DP shall confirm which software version to perform Work in.
b. Scope of BIM Work that may be performed using Autodesk Revit and loaded to a cloud-based location.

2. DP shall keep a published file for each BIM model revision used for design reviews for the purpose of traceability.
3. All standard pipe, fittings and other components shall be easily identifiable and in addition to geometric dimensions, each standard component shall be specified enough such that it may be furnished and installed from provided design documentation. These components may be pulled from existing catalogs; however, they shall adhere to all data requirements.
   a. Pipe and fittings
   b. Conduit, Cable Tray
   c. Ductwork
   d. Major Structural, and Architectural Elements
   e. Electrical Housing
   f. Instrumentation & Controls Housing
4. DP shall not add any level 7 equipment tags without CITY approval. Equipment may be given a Level 8 tag. Level 8 changes will be done in coordination with CITY. Level 8 must be coordinated to maintain consistency throughout utilities.
5. Tolerances
   a. Equipment locations shall be within a 1" tolerance. If equipment is installed on foundations with cast-in-place, tolerances shall be tightened such that the equipment aligns with foundations.
   b. All equipment component dimensions in BIM model shall have tolerances no greater than 1/4" and representative of the dimensions for all buildings, tanks, equipment, piping, valves, and appurtenances used during project construction.
   c. BIM tolerances will be within the GIS snapping tolerances required for a utility trace. DP shall tighten the tolerance of only the equipment items needed for a GIS utility trace.

B. Existing Facility Assets
1. If the project has a tie-point to an existing asset, it is the DP's responsibility to include all component information needed to complete the tie-in into the BIM model.
2. Existing underground utilities shall use 2D representation.
3. For parameters of exiting assets with missing information and requires an input by software, DP may use the text "N/A".

C. Equipment and Component Specifications
1. All final submittals from Suppliers shall be provided to DP for integration into the BIM model.
2. For equipment packages, actuated valves, instruments, and piping specialty items, a hyperlink shall be used to connect aforementioned items in the BIM model to the project network location for all equipment with a Level 8 code.

D. BIM Parameters
1. DP shall assign equipment tags per Section 01615 – Equipment Identification and Tagging.
2. There shall be a BIM parameter for each field found in CITY's CMMS.

3. Equipment O&M Hyperlinks
    a. All equipment must have parameters added and grouped in accordance with the CITY attribute standards.
    b. In Revit, all CMMS parameters will be located within the “Identity Data” parameter group.
    c. In Revit, All facility asset parameters will be located within the “Data” parameter group.
4. Parameters that are not applicable for components shall be filled in with the text “N/A”

1.07 COORDINATION

A. The coordinate system used for all BIM projects shall be the Missouri Coordinate System of 1983, West Zone and NAVD 88 Datum.
B. CITY and DP will coordinate project phases and the corresponding LOD for each phase before starting any pre-design work or design work using BIM.
C. CITY preference is to have read-only access to current working models and to be able to download a copy of recently published versions of models.
D. It is CITY’s responsibility to integrate BIM with City CMMS. Procedure following is provided as a courtesy.
    1. Tagging of all new equipment shall be per Section 01615 – Equipment Identification and Tagging.
    2. Newly assigned tags are provided to CITY for creation of new assets in CMMS.
    3. CITY issues Facility Key for input into BIM model.
    4. DP will add CMMS Facility Key input as BIM parameter.
    5. BIM will use Facility Key and network location for integration into CMMS.
E. If the project involves the installation of new assets, then DP shall coordinate with CITY to have new CMMS Facility Keys assigned to the new assets. CMMS Facility Keys will be assigned by CITY after equipment tags have been assigned.

1.08 RECORD BIM DATA

A. General: Transmit published BIM and all related files for CITY’s reference during normal working hours. Any construction-related needs will be deferred to construction drawings for interpretation by DP.
B. At the end of the project, Record BIM Data shall be incorporated to include but not limited to: 3D representation of Work, all data parameters completed and all linked information in relative file paths.
C. Data Parameters
    1. BIM and its data shall be conformed to construction records prior to BIM turnover.
    2. For BIM facility asset parameters, fill out all data parameters as defined in 013124.A – Attribute Standard including relative hyperlinks per the file structure for all information the DPs/Contractors have.
    3. Any hyperlink will direct the user to the designated file location.
    4. Transmittals required by DP must be included in the CITY’s Record Submittal Zip File. All files stored in Windows 10 shall have tag metadata that includes CMMS Level 1 through CMMS Level 8 asset information.

5. The folder containing the designated file locations will appear as shown in Figure 01.

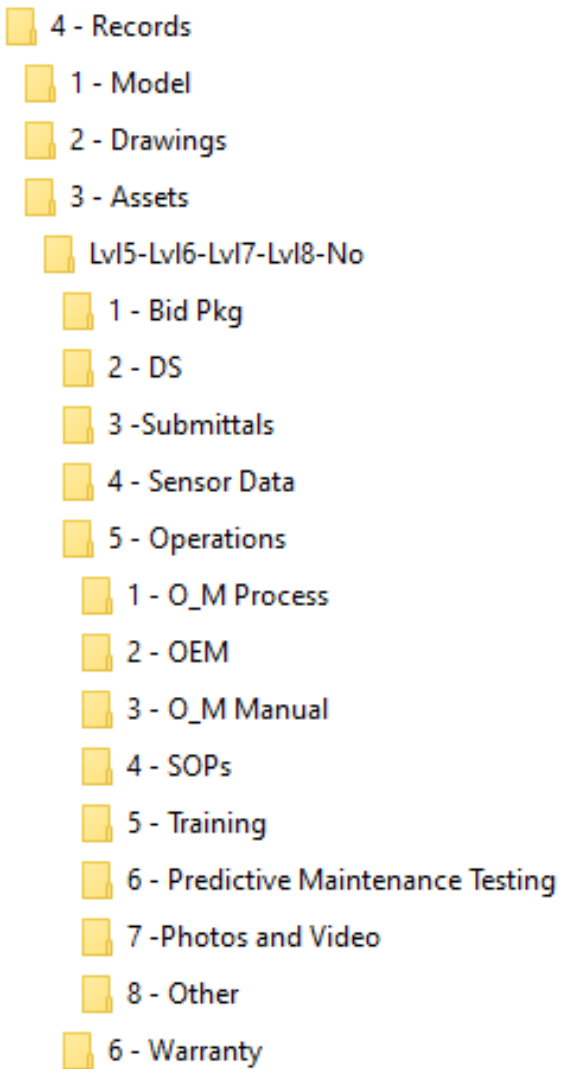

Figure 01: Record Submittal Zip File Structure

D. Submission
   1. BIM model must be cross-checked against field records and is free of conflicting data.
   2. Each BIM parameter with a link to a file shall be confirmed to work using relative file paths. Relative file paths will be used when during turnover of the Revit model and equipment documentation. Refer to CITY's Attribute Standard and CITY zip submittal.
   3. Naming of BIM files must be coordinated with CITY's representative prior to submission at Closeout. At CITY's discretion, the file names will change at request by CITY.

4. Give particular attention to information on equipment components that cannot be readily identified in the field and recorded later.

E. For requirements regarding closeout procedures, refer to Section 01019.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

Equipment Parameters

Notes:

1. For the parameters listed herein, the parameters shall be found within the following parameter groups in Revit.
   - Project Procurement Parameters -> General
   - Model Content Parameters -> Layers
   - Asset Identification Parameters -> Identity Data
   - Facility Asset Paramters -> Data
   - Asset Data Parameters -> Construction
   - GIS Parameters -> Graphics

Asset Identification Parameters			
ID Attribute	Attribute Description	Example Data	Comment
00CMMSAssetTag	CMMS Asset Tag	(Lvl.1)-(Lvl.2)-(Lvl.3)-(Lvl.4)-(Lvl.5)-(Lvl.6)-(Lvl.7)-(CMMS Equipment Number)	Text
01CMMSFacilityKey	CMMS Facility Key	(Assigned by KCWater)	Text
02CMMSPortal	CMMS Portal		URL
03CMMSDept	CMMS Department (Lvl. 1)	WSD	Text
04CMMSDiv	CMMS Division (Lvl. 2)	Wastewater	Text
05CMMSSec	CMMS Section (Lvl. 3)	Treatment	Text
06CMMSSubArea	CMMS Sub-Area (Lvl. 4)	PXXX	Text
07CMMSProc	CMMS Process/Function (Lvl. 5)		Text
08CMMSSubProc	CMMS Systems (Lvl. 6)		Text
09CMMSEquip	CMMS Equipment (Lvl. 7)		Text
10CMMSNumb	CMMS Equipment Number		Number
11CMMSDescription	CMMS Description		Text

Model Content			
Design Attribute	Attribute Description	Example Data	Comment
01DisciplineDesignator(Lvl1)	Discipline Designator Level 1		Text (Options: A, C, D, E, F, G, H, IC, M, P, Q, R, S, T, V)
02DisciplineDesignator(Lvl2)	Discipline Designator Level 2		Text

Project Procurement			
Design Attribute	Attribute Description	Example Data	Comment
01Project Number	Project Number		Integer
02BidPkgNumber	Bid Package Number		Text (This is the Contract Advertising Number for Contractor and/or Subcontractor)
03ProvidedBy	Provided By		Text (Options: Contractor, Design-Builder, Manufacturer, Owner)
04InstalledBy	Installed By		Text (Options: Contractor, Design-Builder, Manufacturer, Owner)
05LocalRep	Local Representative		Text
06Installation Date	Installation Date		Text
07Commission Date	Commission Date		Text
08Decommission Date	Decommission Date		Text
09Warranty Start Date	Warranty Start Date		Text
10Warranty Expiration Date	Warranty Expiration Date		Text
11Procurement Package	Procurement Package		Text (This is the advanced work package number associated with equipment item)
12Equipment Datasheet	Equipment Datasheet		

Asset Data			
Design Attribute	Attribute Description	Example Data	Comment
01Expected Asset Category	Expected Asset Category		Text
02Expected Life In Years	Expected Life in Years		Text
03Install Date (20XX.XX.XX)	Installation Date		Text
04Warranty Expiration Date (20XX.XX.XX	Warranty Expiration Date		Text
05Location	Location		Text
06Principle Cause of Failure	Principle Cause of Failutre		Text

07Expected Design Life	Expected Design Life		Text
08Remaining Useful Life (RUL)	Remaining Useful Life (RUL)		Text
09Remaining Asset Value (RAV)	Remaining Asset Value (RAV)		Text
10Equipment Cost	Equipment Cost		Integer
11Serial Number	Serial Number		Text
12Manufacturer	Manufacturer		Text
13Model	Model		Text

Facility Design Parameters			
Design Attribute	Attribute Description	Example Data	Comment
01Normal Design Flow	Normal Design Flow		Text
02Normal Design Flow UoM	Normal Design Flow Unit of Measure		Text
03Peak Design Flow	Peak Design Flow		Text
04Peak Design Flow UoM	Peak Design Flow UoM		Text
05Biological Oxygen Demand (BOD)	Biological Oxygen Demand (BOD)		Text
06Biological Oxygen Demand (BOD) UoM	Biological Oxygen Demand (BOD) Unit of Measure		Text
07Chemical Oxygen Demand (COD)	Chemical Oxygen Demand (COD)		Text
08Chemical Oxygen Demand (COD) UoM	Chemical Oxygen Demand (COD) Unit of Measure		Text
09Total Suspended Solids (TSS)	Total Suspended Solids (TSS)		Text
10Total Suspended Solids (TSS) UoM	Total Suspended Solids (TSS) Unit of Measure		Text
11Volatile Suspended Solids (VSS)	Volatile Suspended Solids (VSS)		Text
12Volatile Suspended Solids (VSS) UoM	Volatile Suspended Solids (VSS) Unit of Measure		Text
13Total Kjedahl Nitrogen (TKN)	Total Kjedahl Nitrogen (TKN)		Text
14Total Kjedahl Nitrogen (TKN) UoM	Total Kjedahl Nitrogen (TKN) Unit of Measure		Text
15NH3-N	NH3N		Text
16NH3-N UoM	NH3N Unit of Measure		Text
17Alkalinity	Alkalinity		Text
18Alkalinity UoM	Alkalinity Unit of Measure		Text
19pH	pH		Text

GIS Parameters			
Design Attribute	Attribute Description	Example Data	Comment
01BIM (Prefix)	BIM (Prefix)		Text - (Revit)
02BIM (UnID)	BIM (UnID)		Text - (Revit)
03BIM (Suffix)	BIM (Suffix)		Text - (Revit)
04EDMS Drawings (Prefix)	EDMS Drawings (Prefix)		Text (Currently utilizing Sharepoint)
05EDMS Drawings (UnID)	EDMS Drawings (UnID)		Text - (Currently utilizing Sharepoint)
06EDMS Drawings (Suffix)	EDMS Drawings (Suffix)		Text - (Currently utilizing Sharepoint)
07EDMS O&M Documents (Prefix)	EDMS O&M Documents (Prefix)		Text - SOPs, O&M Manuals, Training, Digital Media, Other (Currently utilizing Sharepoint)
08EDMS O&M Documents (UnID)	EDMS O&M Documents (UnID)		Text - SOPs, O&M Manuals, Training, Digital Media, Other (Currently utilizing Sharepoint)
09EDMS O&M Documents (Suffix)	EDMS O&M Documents (Suffix)		Text- SOPs, O&M Manuals, Training, Digital Media, Other (Currently utilizing Sharepoint)
10CMMS O&M Logs (Prefix)	CMMS O&M Logs (Prefix)		Text - Predictive, Preventative, Corrective, (Currently utilizing infoR)
11CMMS O&M Logs (UnID)	CMMS O&M Logs (UnID)		Text - Predictive, Preventative, Corrective, (Currently utilizing infoR)
12CMMS O&M Logs (Suffix)	CMMS O&M Logs (Suffix)		Text - Predictive, Preventative, Corrective, (Currently utilizing infoR)
13Mixed Reality (Prefix)	Mixed Reality (Prefix)		Text
14Mixed Reality (UnID)	Mixed Reality (UnID)		Text
15Mixed Reality (Suffix)	Mixed Reality (Suffix)		Text

SECTION 01352 – SELECTIVE ALTERATIONS AND DEMOLITION

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes:
    1. Cutting or modifying existing or new work.
    2. Partial demolition of structures.

1.02 REFERENCES

A. American National Standards Institute (ANSI):
    1. A10.6 - Safety and Health Program Requirements for Demolition Operations.
B. International Concrete Repair Institute (ICRI):
    1. Guideline No. 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair.
    2. Guideline No. 310.3R - Guide for the Preparation of Concrete Surfaces for Repair Using Hydro Demolition Methods.

1.03 RELATED SECTIONS

A. Section DB 00700 – General Conditions (Design-Build Project Delivery)
B. Section DB 00800 – Supplementary Conditions (Design-Build Project Delivery)
C. Section 00700 – General Conditions (Design-Bid-Build Project Delivery)
D. Section 00800 – Supplementary Conditions (Design-Bid-Build Project Delivery)
E. Section 01015 – Specific Project Requirements.
F. Section 01020 – Record Documents.
G. Section 01140 – Work Restrictions.
H. Section 01300 – Submittals.
I. Section 01329 – Safety Plan.
J. Section 01354 – Hazardous Material Procedures.
K. Section 01566 – Cleanup Operations.
L. Section 01580 – Project Signs.
M. Section 02300 – Earthwork.

1.04 DEFINITIONS

A. Chipping hammer: A hand-operated electrical or pneumatic demolition device for removal of hardened concrete or masonry materials having a weight of less than 15 pounds and an impact frequency of greater than 2,000 blows/minute.
B. Concrete breaker: A hand-operated electrical or pneumatic demolition device for removal of hardened concrete or masonry materials having a weight greater or impact frequency less than the limits defined for a chipping hammer.
C. Coring equipment: Non-impact rotary drill with diamond cutting edges.
D. Heavy abrasive blast: Cleaning procedure by which various abrasives materials, or steel shot, are forcibly propelled by high pressure against a surface to remove loose material and produce a concrete surface roughened to ICRI Surface Profile CSP-7, or higher, as specified in ICRI 301.3R.
E. Salvage materials: Materials removed from existing facility.

1.05 DESCRIPTION OF WORK

A. The work includes partial demolition, cutting, and modifying of existing facilities, utilities, and/or structures.
B. These facilities may be occupied and/or operational. Satisfactory completion of the work will require that the Contractor plan activities carefully to work around unavoidable obstacles and to maintain overall stability of structures and structural elements. It will further require restoration of existing facilities, utilities, and structures that are to remain in place and that are damaged by demolition or removal operations.

1.06 SUBMITTALS

A. General:
    1. Submit as specified in Section 01300 - Submittals.
B. Shop drawings include:
    1. Demolition Plan outlining the proposed sequence of events and procedures to be utilized for any demolition activities required as part of the Work. This plan shall include a plan for proper notification of Owner and other affected parties relative to the respective Work.
    2. The location of all embedded items shall be documented using diagrams and/or other media that clearly show dimensions and locations of existing structural elements, existing embedded items, and any new embedded items and their relationship to each other.
C. Submittals for information only:
    1. Permits and notices authorizing demolition.
    2. Certificates of severance of utility services.
    3. Permit for transport and disposal of debris.
D. Quality assurance submittals:
    1. Qualifications of non-destructive testing agency/agencies.
E. Project record documents.
F. Drawings and/or other media documenting locations of service lines and capped utilities.

1.07 QUALITY ASSURANCE

A. Qualifications:
    1. Assign relocation, removal, cutting, coring, and patching to trades and workers qualified to perform the Work in a manner that causes the least damage and that provides means of returning surfaces to an appearance at least equal to that of the surrounding areas unaffected by the Work.
    2. Non-destructive testing agencies shall have a minimum of 5 years' experience performing non-destructive testing for location of steel reinforcement in existing concrete under conditions that are similar to that required for this Work.

1.08 SEQUENCING

A. Perform Work in sequences and within times specified in Section 01140 - Work Restrictions.
B. If the facility or utility to be modified cannot be removed from service, perform the Work while the facility is in operation using procedures and equipment that do not jeopardize operation or materially reduce the efficiency of that facility.

C. Coordinate the Work with operation of the facility:
    1. Do not begin alterations of designated portions of the Work until specific permission for activities in each area has been granted by Owner in writing.
    2. Engineer will coordinate the planned procedure with facility manager.
    3. Complete Work as quickly and with as little delay as possible.
D. Operational functions of the facility that are required to be performed to facilitate the Work will be performed by facility personnel only.
E. Owner will cooperate in every way practicable to assist in expediting the Work.
F. When necessary for the proper operation or maintenance of portions of the facility, reschedule operations so the Work will not conflict with required operations or maintenance.

1.09 REGULATORY REQUIREMENTS

A. Dispose of debris in accordance with governing regulatory agencies.
B. Comply with applicable air pollution control regulations.
C. Obtain permits for building demolition, transportation of debris to disposal site and dust control.

1.10 PREPARATION

A. Non-destructive evaluation of existing concrete and masonry:
    1. Prior to cutting, drilling, coring, and/or any other procedure that penetrates existing concrete [or masonry], retain and pay for the services of a qualified non-destructive testing agency to perform investigations to determine the location of existing steel reinforcement, plumbing, conduit, and/or other embedment's in the concrete.
    2. Submit documentation of the investigations to the Engineer for review and approval as specified in Section 01300 - Submittals before any work involving penetration of existing concrete is initiated.
B. Obtain permission from adjacent property owners, including railroads, when outriggers, swinging cranes, and other equipment may have to traverse or extend into adjacent property.

1.11 PROJECT CONDITIONS

A. Do not interfere with use of adjacent structures and elements of the facility not subject to the Work described in this Section. Maintain free and safe passage to and from such facilities or adequate barriers to prevent unsafe passage.
B. Provide, erect, and maintain barricades, lighting, guardrails, and protective devices as required to protect building occupants, general public, workers, and adjoining property:
    1. Do not close or obstruct roadways without permits.
    2. Conduct operations with minimum interference to public or private roadways.
C. Prevent movement, settlement, or collapse of structures adjacent services, sidewalks, driveways and trees:
    1. Provide and place bracing or shoring.
    2. Cease operations and notify Engineer immediately when safety of structures appears to be endangered. Take precautions to properly support structure. Do not resume operations until safety is restored.

3. Assume liability for movement, settlement, or collapse.
4. Promptly repair damage.

D. Provide and arrange for capping and plugging utility services. Disconnect and stub off.
    1. Notify affected utility company in advance and obtain approval before starting demolition.
    2. Place markers to indicate location of disconnected services.

E. Unknown conditions:
    1. The drawings may not represent all conditions at the site and adjoining areas. Compare actual conditions with drawings before commencement of Work.
    2. Existing utilities and drainage systems below grade are located on the Drawings based on information from existing documents and from surface facilities such as manholes, valve boxes, area drains, and other surface fixtures.
    3. If existing active services encountered are not indicated or otherwise made known to the Contractor and interfere with the permanent facilities under construction, notify the Engineer in writing, requesting instructions on their disposition. Take immediate steps to ensure that the service provided is not interrupted, and do not proceed with the Work until written instructions are received from the Engineer.

PART 2 - PRODUCTS

2.01 SALVAGE MATERIALS

A. No materials shall be designated for salvage.

PART 3 - EXECUTION

3.01 EXAMINATIONS

A. Prior to beginning selective demolition operations, perform a thorough inspection of the facility and site, and report to the Engineer defects and structural damage to, or deterioration of existing construction to remain.

B. Examine areas affected by the Work and verify the following conditions prior to commencing demolition:
    1. Disconnection of utilities as required.
    2. Utilities serving occupied or active portions of surrounding facilities will not be disturbed, except as otherwise indicated.

C. If unsatisfactory conditions exist, notify the Engineer, and do not begin demolition operations until such conditions have been corrected.

3.02 PREPARATION

A. General:
    1. Review Section 01354 – Hazardous Material Procedures, before beginning selective alterations and demolition work.

B. Protection:
    1. Erect weatherproof closures to protect the interior of facilities and elements or equipment that are not designed for exposure to the weather. Provide temporary heat, cooling, and humidity

control as necessary to prevent damage to existing and new construction. Maintain existing exiting paths and/or provide new paths in compliance with Building Code requirements.

2. Erect and maintain dustproof partitions as required to prevent spread of dust, to other parts of building. Maintain negative pressure in the area where the Work is being performed to prevent the accidental spread of dust and to minimize the spread of fumes related to the Work.
3. Upon completion of Work, remove weatherproof closures and dustproof partitions, and repair damaged surfaces to match adjacent surfaces.
4. Provide and maintain protective devices to prevent injury from falling objects.
5. Locate guardrails in stairwells and around open shafts to protect workers. Post clearly visible warning signs.
6. Cause as little inconvenience to adjacent building areas as possible.
7. Protect landscaping, benchmarks, and existing construction to remain from damage or displacement.
8. Carefully remove designated materials and equipment to be salvaged by Owner or reinstalled.
9. Store and protect materials and equipment to be reinstalled.

C. Layout:
   1. The limits of selective demolition are indicated on the Drawings. Confine demolition operations within the limits indicated on the Drawings.
   2. Lay out demolition and removal work at the site and coordinate with related Work for which demolition and removal is required. Clearly mark the extent of structural elements to be removed on the actual surfaces that will be removed.
   3. Arrange for Engineer's inspection of the lay out extents.
   4. Do not begin demolition/removal operations until the lay out markings have been reviewed by the Engineer.

3.03 DEMOLITION

A. General:
   1. Perform demolition work in accordance with ANSI A10.6.
   2. Demolish designated portions of structures and appurtenances in orderly and careful manner in accordance with the Selective Demolition Plan.
   3. Conduct demolition and removal work in a manner that will minimize dust and flying particles.
      a. Use water or dust palliative when necessary to prevent airborne dust.
      b. Provide and maintain hoses and connections to water main or hydrant.
   4. Demolish concrete and masonry in small sections. Perform demolition with small tools as much as possible. Blasting with explosive charges is not permitted.
   5. Sawcut concrete to establish the edges of demolition, wherever possible.
      a. Do not use a concrete breaker within 6 inches of reinforcing or structural metals that are designated to remain.
      b. At edges that are not sawcut, remove the final 6 inches of material with a chipping hammer as defined herein. At surfaces where material is removed with a chipping hammer, follow with a heavy abrasive blast to remove all loose material and microcracking.
      c. Alternate techniques to remove concrete may be used if acceptable to the Engineer; however, techniques other than those deemed by ICRI Guideline No. 310.2R to

provide a low risk of introducing microcracking will require a subsequent procedure to remove loose material.

d. Provide final surface preparation for concrete repairs as specified in Division 3 specifications.

6. At locations indicated on the Drawings that the existing reinforcing is to be preserved, remove concrete using methods that do not damage the reinforcing. Use one of the following techniques:
    a. Hydro demolition techniques as outlined in ICRI Guideline No. 310.3R.
    b. Chipping hammer, as defined herein, followed by heavy abrasive blast to remove all loose material and microcracking at remaining surfaces impacted by the chipping hammer.
    c. Alternate methods may be used, only if acceptable to the Engineer.
    d. For all methods, provide a small, completed area for Engineer's review and acceptance. If the proposed method, in the opinion of the Engineer, damages the reinforcing, revise the removal method to remove the concrete with a less aggressive technique to protect the reinforcing.
7. Remove materials carefully, to the extent indicated and as required.
    a. Provide neat and orderly junctions between existing and new materials.
    b. Use methods that terminate surfaces in straight lines at natural points of division.
8. Do not remove anything beyond the limits of Work indicated without prior written authorization of the Engineer. If in doubt about whether to remove an item, obtain written authorization of the Engineer prior to proceeding.
9. Perform work to provide the least interference and most protection to existing facilities to remain.
10. Assume possession of demolished materials, unless otherwise indicated on the Drawings or specified.
    a. Remove demolished materials from site at least weekly and dispose of in accordance with Laws and Regulations.
11. Do not burn materials on site.

B. Sizing of openings in existing concrete or masonry:
1. Make openings large enough to permit final alignment of pipe and fittings without deflections, but without oversizing.
2. Allow adequate space for packing around pipes and conduit to ensure watertightness.
3. If the Engineer deems the opening to be insufficient in size to accomplish these criteria, remove additional material using the procedures outlined in this Section.

C. Cutting openings in existing concrete or masonry:
1. Do not allow saw cuts to extend beyond limits of openings.
2. Create openings by the following method or other means acceptable to the Engineer that prevents over-cutting of member at corners:
    a. Core-drill through slab or wall at corners, being careful not to damage materials beyond the area to be removed.
    b. Saw cut completely through the member, between the core holes at the corners.
    c. As an alternate to sawcutting through the member, score the edges of the opening with a saw to a 1-inch depth on both surfaces (when accessible).
        (1) Remove concrete or masonry to within 6 inches of material to remain with a concrete breaker.

(2) Remove the remaining material with a chipping hammer.

d. Remove the remaining material at the corners left by the core-drilling with a chipping hammer.

3. Prevent debris from falling into adjacent tanks or channels in service or from damaging existing equipment and other facilities.

D. Pump out buried tanks. Remove tanks and service piping from site.

E. Immediately upon discovery, remove and dispose of contaminated, vermin-infested, or dangerous materials using safe means that will not endanger health of workers and public.

F. Remove trees and shrubs within marked areas; clear undergrowth and dead plant material as specified in Section 02300 - Earthwork.

G. Backfill open pits and holes caused by demolition as specified in Section 02300 - Earthwork.

H. Rough grade areas affected by demolition.

I. Remove demolished materials, tools, and equipment upon completion of demolition.

3.04 RESTORATION

A. General:

1. Repair damage caused by demolition to conditions equal to those that existed prior to beginning of demolition.
    a. Patch and replace portions of existing finished surfaces that are damaged, lifted, and discolored with matching material. Refinish patched portion surfaces in a manner which produces uniform color and texture to entire surface.
    b. When existing finish cannot be matched, refinish entire surface to nearest change of plane where angle of change exceeds 45 degrees.
2. The cost of repairs shall be at the Contractor's expense, and no increase in the Contract Price.
3. When new construction abuts or finishes flush with existing construction, make smooth transitions. Match finish of existing construction.
4. Where partitions are removed, patch floors, walls, and ceilings with finish materials that match existing materials.
5. Where removal of partitions results in adjacent spaces becoming one, rework floors, walls, and ceilings to provide smooth planes without breaks, steps, or bulkheads.
6. Where changes of plane exceed 2 inches, request instructions for making transition.
7. Trim and refinish existing doors as necessary to clear new floors.
8. Match patched construction with adjacent construction in texture and appearance so that patch or transition is invisible at 5-foot distance.
9. When finished surfaces are cut so that smooth transition is impossible, terminate existing surface in neat manner along straight line at natural line of division and provide appropriate trim.

B. Restore existing concrete reinforcement as follows:

1. Where existing reinforcement is to be incorporated into the new Work, protect, clean, and extend into new concrete.
2. Where existing reinforcement is not to be retained, cut off as follows:
    a. At the removal line where new concrete joins existing concrete, cut reinforcement flush with concrete surface.
    b. Where concrete surface at the removal line will become the finished surface, cut reinforcement 2 inches below the surface, paint ends with epoxy, and patch holes with dry pack mortar.

C. Restore areas affected by removal of existing equipment, equipment pads and bases, piping, supports, electrical panels, electric devices, and conduits such that little or no evidence of the previous installation remains:
    1. Fill areas in existing floors, walls, and ceilings from removed piping, conduit, and fasteners with non-shrink grout and finish smooth.
    2. Remove concrete bases for equipment and supports by:
        a. Saw cutting clean, straight lines with a depth equal to the concrete cover over reinforcement minus 1/2 inch below finished surface.
            (1) Do not cut existing reinforcement on floors.
        b. Chip concrete within scored lines and cut exposed reinforcing steel and anchor bolts.
        c. Patch with non-shrink grout to match adjacent grade and finish.
    3. Terminate abandoned piping and conduits with blind flanges, caps, or plugs.

3.05 FIELD QUALITY CONTROL

A. Do not proceed with demolition without Engineer's inspection of lay out.
B. Do not deviate from the submitted demolition plan without notifying the Engineer prior to Work.

End of Section

SECTION 01354 – HAZARDOUS MATERIAL PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes procedures required when encountering hazardous materials, including asbestos and lead-based paint (LBP), at the Work site.

1.02 REFERENCES

A. Occupational Safety and Health Administration (OSHA) United States Code of Federal Regulations (CFR) including, but not limited to:
    1. Title 29 - Labor:
        a. 1910 – Occupational Safety and Health Standards
            (1) 1910.1025 – Lead
            (2) 1910.1001 – Asbestos
            (3) 1910.1200 – Hazard Communication
        b. 1926 – Safety and Health Regulations for Construction
            (1) 1926.62 – Lead
            (2) 1926.1101 – Asbestos
            (3) 1926.65 – Hazardous waste operations and emergency response (HAZWOPER)
            (4) 1926.59 – Hazard Communication
B. United States Environmental Protection Agency (USEPA) including, but not limited to:
    1. Title 40 - Protection of Environment:
        a. Part 61, Subpart M – National Emission Standard for Asbestos
        b. Part 261 - Identification and Listing of Hazardous Waste
        c. Part 763 – Asbestos
C. Missouri Department of Natural Resources (MDNR):
    1. Revised Statutes of Missouri Title XL Additional Executive Departments
        a. Chapter 643 – Air Conservation
            (1) 225 – 265 – Asbestos Abatement and Asbestos Removal
D. Society for Protective Coatings (SSPC):
    1. SSPC Guide 6 (SSPC-6) – Guide for Containing Surface Preparation Debris Generated During Paint Removal Operations
    2. SSPC Guide 7 (SSPC-7) – Guide to Disposal of Lead-Contaminated Surface Preparation Debris
E. Existing KCMO WSD Reports (available upon request from WSD Project Manager):
    1. (Request from City of Kansas City, MO – Water Services Department Project Manager)

1.03 RELATED SECTIONS

A. Section DB 00700 – General Conditions (Design-Build Project Delivery)
B. Section DB 00800 – Supplementary Conditions (Design-Build Project Delivery)
C. Section 00700 – General Conditions (Design-Bid-Build Project Delivery)
D. Section 00800 – Supplementary Conditions (Design-Bid-Build Project Delivery)
E. Section 01015 – Specific Project Requirements.
F. Section 01020 – Record Documents.
G. Section 01140 – Work Restrictions.
H. Section 01300 – Submittals.
I. Section 01329 – Safety Plan.
J. Section 01565 – Asbestos Abatement.
K. Section 01566 – Cleanup Operations.
L. Section 01580 – Project Signs.

1.04 SUBMITTALS

A. Hazardous Materials Management Plan (HMMP):
    1. The HMMP will be submitted at least 10 days prior to the commencement of the Work and is the CONTRACTOR's comprehensive plan for the management of hazards encountered during the work, and should include:
        a. Information about the CONTRACTOR's designated Certified Industrial Hygienist (CIH) per Part 1.05 of this Section and SECTION 01565.
        b. Spill management procedures in the event of asbestos, lead or any other hazardous materials release.
        c. Intended methods of hazardous materials removal, containment, and disposal, including description of engineering controls, personal protective equipment (PPE), and compliance monitoring.
        d. Schedule and sequence of work for all hazardous materials work.
        e. A copy of the Site-Specific Hazard Communication Plan in accordance with 29 CFR 1910.1200.
        f. Copies of licenses, certifications, fit test records, medical surveillance records and notifications to handle and control hazardous materials, as applicable.
B. Submit laboratory reports, as applicable.
C. Refer to SECTION 01565 – ASBESTOS ABATEMENT for additional requirements.

1.05 DEFINITIONS

A. Refer to Section 01420 – Definitions and Acronyms

1.06 HAZARDOUS MATERIALS PROCEDURES

A. When hazardous materials are encountered that were identified by existing reports prepared for WSD:
    1. Prepare and initiate implementation of the HMMP, as detailed in Part 1.04 of this Section.
    2. Complete notifications to Federal, State and local agencies as required by applicable Laws and Regulations within the times stipulated by such Laws and Regulations.
    3. CONTRACTOR will designate a CIH, as required per Part 1.04 of this Section, to issue pertinent instructions and recommendations for protection of workers and other affected persons' health and safety.

4. Identify and contact subcontractors and licensed personnel qualified to undertake storage, removal, transportation, disposal, and other remedial work required by, and in accordance with, applicable laws and regulations.

B. When hazardous materials are encountered that were not identified by existing reports prepared for WSD:
    1. Prepare and initiate implementation of the HMMP as detailed in Part 1.04 of this Section.
    2. Notify immediately OWNER, ENGINEER, and other affected parties.
    3. Complete notifications to Federal, State and local agencies as required by applicable Laws and Regulations within the times stipulated by such Laws and Regulations.
    4. CONTRACTOR will designate a CIH, as required per Part 1.04 of this Section, to issue pertinent instructions and recommendations for protection of workers and other affected persons' health and safety.
    5. Identify and contact subcontractors and licensed personnel qualified to undertake storage, removal, transportation, disposal, and other remedial work required by, and in accordance with, applicable laws and regulations.
C. Forward to OWNER copies of reports, permits, receipts, and other documentation related to remedial work.
D. CONTRACTOR will assume responsibility for worker health and safety, including health and safety of subcontractors and their workers.
    1. Provide training to workers on recognition, reporting, and safety and health procedures required when hazardous materials are encountered, as relevant to the Work.
E. File requests for adjustments to Contract Times and Contract Price due to the finding of previously unidentified hazardous materials at the Work site in accordance with Contract Documents.
    1. CONTRACTOR and subcontractors will minimize delays by continuing performance of the Work in areas not affected by hazardous materials operations.

1.07 LEAD-BASED PAINT REMOVAL AND DISPOSAL

A. Includes existing paint on the interior and/or exterior surfaces, as outlined in the LBP Survey Report for WSD per SSPC specifications, which may contain lead in concentrations which will require implementation of hazardous material compliance procedures as legislated by CFR Title 29 and Title 40.
B. CONTRACTOR and/or its' subcontractors will collect samples of suspected LBP using the methods and frequencies prescribed by CFR Title 29 and Title 40 from the structures identified herein and have samples tested by a certified testing laboratory to determine lead content in samples.
    1. Collect a sufficient number of paint samples to provide adequate information regarding lead content in paint on the interior and/or exterior surfaces outlined in the LBP Survey Report for WSD per SSPC specifications.
    2. Ensure that samples contain the total thickness of the paint to the substrate, where removed.
    3. Ensure that each sample contains a sufficient quantity of paint to facilitate proper and adequate analyses by testing laboratory.
    4. Ensure that samples are adequately identified with location from which it was removed.
C. Laboratory testing will be completed in accordance with applicable testing standards by a National Lead Laboratory Accreditation Program (NLLAP)–certified laboratory.
    1. Submit 10 copies of complete laboratory analyses of paint samples.
D. Prior to beginning the Work associated the removal, containment, and disposal of LBP and associated debris, prepare and submit to the OWNER 10 copies of the HMMP, as required by Part 1.04 of this Section. The HMMP will detail the following:

1. Listing of LBP removal equipment to be used.
2. Outline of procedures to be used to remove LBP.
3. Data and specifications describing chemical stripping materials to be used, if applicable.
4. Data and specifications describing abrasive blast materials and grit size to be used, if applicable.
5. Description of planned LBP removal, hazardous waste debris containment, and hazardous waste disposal methods.
6. Safety plan, consisting of a written plan of action covering operational requirements for safe removal of LBP, safe handling and containment of waste and debris generated by the operation, and safe disposal of hazardous waste and non-hazardous waste materials, complying with the most stringent requirements of the following:
    a. Equipment and material manufacturer's safety sheets.
    b. 29 CFR 1910.1025.
    c. 29 CFR 1926.62.
7. Certifications of personnel to perform work.
8. Selection of an appropriately permitted disposal facility.

E. Carry out LBP removal, containment, and disposal work in accordance with SSPC guidelines.
F. Assume responsibility for the proper implementation of the LBP removal method selected. When abrasive blast cleaning is selected to remove LBP, comply with all applicable Federal, State, and local air quality, pollution, and environmental control regulations for blast cleaning. When chemical stripping is selected to remove the LBP, adhere to the chemical manufacturer's recommendations for the application of the product, the removal of the paint, and the containment of the debris.
G. LBP removal work shall be performed by a Contractor having prior experience in the removal method selected and shall provide at least 5 references of similar projects completed, 3 of which must have been completed within the past 12 months, documenting their experience.
H. Utilize a minimum of Class 3 containment and ventilation system, as described in SSPC-6, during LBP removal and containment procedures, as required for the conditions.
I. Do not leave spent abrasive blast material, chemical stripping material, or LBP debris uncontained on the project site overnight.
J. Test each container of paint debris, spent blast cleaning abrasive, chemical stripping debris, and other waste material generated by the operation to determine the waste material hazardous waste classification, as required by 40 CFR 261 and the selected disposal facility.
K. Assume responsibility for the disposal of LBP waste and associated waste generated by the removal of the LBP and the preparation of the surfaces for recoating. Dispose in accordance with applicable Federal, State, local, and selected disposal facility requirements and regulations.
L. Accurately complete the Uniform Hazardous Waste Manifest included at the end of SSPC-7. Indicate on the Manifest that the OWNER is the hazardous waste generator and obtain the OWNER's USEPA identification number for use in completing the Manifest.

1.08 ASBESTOS MATERIALS

A. It is the specific intent of these Contract Documents to exclude from the Work any and all new products or materials containing asbestos. No products containing asbestos shall be incorporated in the Work.
B. Refer to the list of reports prepared for WSD, referenced in Part 1.2 of this Section, identifying locations which may have ACM. The reports also designate the condition of the ACM in each location as either friable or non-friable.

C. Asbestos abatement shall be executed as outlined in SECTION 01565 – ASBESTOS ABATEMENT of these Contract Documents.

PART 2 - PRODUCTS

PART 3 – EXECUTION

3.01 ASBESTOS MATERIALS

A. Notifications:
    1. CONTRACTOR shall notify OSHA 24 hours prior to performing ACM removal operations.
    2. CONTRACTOR will provide written notification to USEPA Regional Asbestos NESHAP contact at least 20 working days prior to the start of the Work per SECTION 01565.
    3. CONTRACTOR shall notify MDNR at least 10 working days prior to the start of performing ACM removal operations.
    4. CONTRACTOR shall notify OWNER 3 working days in advance of commencing asbestos material removal operations.
B. Work area:
    1. CONTRACTOR will establish a regulated work area, using at a minimum, construction warning tape to establish limits of work area for the asbestos material removal.
    2. On-site stockpiling or storage of ACM designated for disposal shall not be allowed.
C. Safety:
    1. CONTRACTOR's safety plan will be provided as part of the HMMP (Part 1.02) and will detail requirements, as outlined in 29 CFR 1910.1001, 40 CFR 1926.1101 and 40 CFR 1926.65.
D. Worker qualifications:
    1. Refer to SECTION 01565 – ASBESTOS ABATEMENT of these Contract Documents for qualifications for personnel performing asbestos abatement work.
E. Legal disposal:
    1. Refer to SECTION 01565 – ASBESTOS ABATEMENT for asbestos disposal requirements.

END OF SECTION

SECTION 01400 - QUALITY CONTROL

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Quality assurance - control of installation.

B. Reference and standards.

1.2 RELATED SECTIONS

A. Section 01300 - Submittals: Submission of manufactures' instructions and certificates.

1.3 QUALITY ASSURANCE - CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform Work by persons qualified to produce required and specified quality.

1.4 REFERENCES AND STANDARDS

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date for receiving bids, except where a specific date is established by code.

C. Obtain copies of standards where required by product specification sections.

D. Neither the contractual relationships, duties, nor responsibilities of the parties in Contract nor those of the Engineer shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that existing site conditions are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Examine and verify specific conditions described in the applicable individual specification sections.

3.2 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

End of Section.

SECTION 01420 – DEFINITIONS AND ACRONYMS

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers all definitions and acronyms for terms used throughout Division 01 Sections of Contract Documents and as required for software integrations.

1.02 RELATED SECTIONS

A. Section 00700 – General Conditions
B. Section 01020 – Record Documents_Facilities
C. Section 01300 – Submittals_Facilities
D. Section 01320 – Construction Progress Documentation
E. Section 01352 – Selective Alterations and Demolition
F. Section 01354 – Hazardous Material Procedures
G. Section 01433 – Manufacturer's Field Service
H. Section 01480 – Water Tightness
I. Section 01600 – Product Delivery Storage and Handling
J. Section 01615 – Equipment Identification and Tagging
K. Section 13500 – SCADA Software Standards and Conventions

1.03 DEFINITIONS

A. Any definitions listed herein shall be superceded by any definitions listed in Section 00700 - Construction General Conditions.

B. **Contract Definitions**

1. **City** – The City of Kansas City, Missouri. Also "Owner"
2. **Contract for Design-Build Services** – The entire agreement between the City and the Design-Builder, including all amendments, which will establish the terms and conditions for the performance of the design-build services for the Project.
3. **Contractor/Design-Builder** – The entity that will serve as the Project developer and enter into a contractual relationship with the City, and that will be the single point of accountability to the City for delivery of the services and the Project. The entity is required to be a licensed contractor in Missouri. The builder will be responsible for both Designing and Building the Project.
4. **Design Manager** – Engineer employeed by the Lead Designer or Lead Contractor who will manage all the design work on this project.
5. **Discipline Design Lead(s)/Manager(s)** – Engineers leading the effort to design specific disciplines.
6. **Headworks** – Preliminary systems for wastewater treatment plants including wastewater coarse screens, fine screens, and grit removal for the purpose of removing trash, debris, or other large solids from influent flow.

7. **Key Personnel** – The individuals, employed by Design-Builder or other firm included on the Project Team, who would fill certain key roles in delivery of the Project and related services if Design-Builder is chosen and may not be removed or substituted without City's written consent, including the following positions:
    a. Design-Build Principal-in-Charge
    b. Design-Build Project Manager
    c. General Contractor's Project Manager or Construction Manager (if different than Design-Build Project Manager)
    d. Design Manager (if different than Design-Build Project Manager)
    e. Discipline Design Leads/Managers
    f. Process Engineering Lead/Manager
    g. On-Site Field Superintendent(s)
    h. Quality Control/Quality Assessment Manager
    i. Safety Officer
    j. Commissioning Manager for Design and Construction
    k. Envision^{TM} Sustainability Professional (ENV SP)
8. **Lead Contractor** – The member of the Project Team that is licensed as a Missouri general contractor and that has primary responsibility for construction services for the Project.
9. **Lead Designer** – The member of the Project Team that employs professional engineers licensed in Missouri and that has primary responsibility for design services for the Project.
10. **Mandatory (Pass/Fail) Requirements** – The requirements set forth in RFQs/RFPs that, at a minimum, must be satisfied (or waived by the City) in order for the SOQ to be evaluated and ranked according to the comparative evaluation criteria.
11. **On-Site Field Superintendent(s)** – Contractor or Sub-Contractor staff that will be leading the construction effort in specific disciplines.
12. **Owner's Advisor** – The firm retained by the City to provide assistance with design review and Construction Phase oversight. The Owner's Advisor may fill the role of Resident Project Representative during Construction and will be further defined in the RFP. The Owner's Advisor will not serve as Designer of Record.
13. **Process Engineering Lead/Manager** – Engineer leading the processing design effort for the thermal hydrolysis process.
14. **Project** – As defined in Section 01110 – Summary of Work
15. **Project Team** – The Design-Builder; the Lead Contractor, and the Lead Designer; and Key Personnel.
16. **Responsiveness Requirements** – The requirements set forth in the Solitation that, at a minimum, must be satisfied (or waived by the City) in order for the

SOQ to be evaluated and ranked according to the comparative evaluation criteria.

17. **Shortlist** – A limited list of Design-Builders selected by the City to compete in the RFP process.
18. **Shortlisted Design-Builder(s)** – Those entities who submit a SOQ in response to the RFQ and are invited to submit proposals in response to a City RFP. The RFP is the second step in the City's two-step procurement process employed to procure a Design-Builder for the Project.

C. **Asset Identification and Tagging Definitions**

1. **Asset Tags** – (may also be known as CMMS tags) A tag/identifier for KC Water Assets. Each level within the identifier has a list of options indicating to the reader where the asset is located within the Department. The form of the identifier is given as (*Level 1 – Level 2 – Level 3 – Level 4 – Level 6 – Level 7 – Level 8*) whereas:
   a. Level 1 Component – City of Kansas City, MO Department
   b. Level 2 Component – Division
   c. Level 3 Component – Section
   d. Level 4 Component – Facility/SubArea
   e. Level 5 Component – System
   f. Level 6 Component – Subsystem
   g. Level 7 Component – Equipment
   h. Level 8 Component – Equipment number

   Example:
   (i) *(Water Services Department–Wastewater–Treatment–P711–PRE–GRSC–GRIT–06400)*
   (ii) Tag Meaning: This asset is Grit Removal Equipment used for screening during preliminary treatment at the Birmingham Wastewater Treatment Plant.
   (iii) For KC Water Facility projects, it may be commonly shorthand abbreviated using Levels 4-8)

   Refer to CITY's tag generator spreadsheet for a full list of assets needing this type of tag.

2. **PLC Shortcuts** – Shortcuts used in the Operator Interface Terminal/Human Machine Interface to establish a path from the HMI to the PLC and is used to identify and label PLCs.
3. **P&ID Tags** – Identifiers used to label equipment and instruments on Process and Instrumentation Diagrams. Each one is composed of 3-5 digit equipment or instrument code followed by a 5 digit loop number. See CITY P&ID tagging standards for more details.

4. **PlantPax Tags** – Identifiers in the PLC software program as object names for all standard PlantPax objects. Tagging Convention is based on ANSI/ISA Table 4.1 and the P&ID Tag loop numbers.
5. **NonPlantPax Tags** – Identifiers not found in standard PlantPax library of objects. This includes objects vendor has created or possibly objects that local integrator needs to create for specialty equipment without a preexisting object type in standard PlantPax library.
6. **Other Tags –** As defined by Section 13500 – SCADA Software Standards and Conventions.

D. **BIM Definitions**

1. **BIM** – Building Information Model
2. **Modeled Object** – An equipment asset created in BIM. Modeled objects are tagged using a parent-child-grandchild data structure.
3. **Overlay** – Placing an object over the surface of another object thus allowing the object to be visible on drawings or other deliverables by viewer.
4. **Revit** – Autodesk BIM software used for Building design, Foundation design, Structural design, and MEP design.
5. **Standard Component** – Any valve, pipe, duct, fitting, cable, cable tray, conduit, wiring, or structural member where aforementioned component is dimensionally defined in a Design Standard.

E. **Construction Progress Definitions**

1. **Activity** - A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
   a. **Critical activity** – Activity on the critical path. They must start and finish on the planned start and finish times.
   b. **Predecessor activity** – Activity that must start or complete before a given activity can be started. No negative lag is allowed.
   c. **Successor activity** – Activity that can not start until the predecessor activity allows it. No negative lag is allowed.
2. **Cost Loading** – All WBS summary activities are cost loaded. The sum total of all cost loaded activities shall equal the total Contract Price of the Contract, including Owner-approved change orders. This shall be equivalent to the total of the Schedule of Values for the Project.
3. **CPM (Critical Path Method)** – A schedule network analysis technique used to determine the amount of scheduling flexibility (the amount of float) on various logical network paths in the project schedule network, and to determine the minimum total project duration. Start and finish dates are calculated by means of a forward pass, using a specified start date. Late start and finish dates are calculated by means of a backward pass, starting from a

specified completion date, which sometimes is the project early finish date determined during the forward pass.

4. **Critical Path** – Generally, but not always, the sequence of schedule activities determining the duration of the project. Generally, it is the longest path through the project. However, a critical path can end, as an example, on a schedule milestone that is in the middle of the schedule model and that has a finish-on-or-before imposed date schedule constraint.
5. **Event** – The starting or ending point of an activity.
6. **Float** – The measure of leeway in starting and completing an activity. Float time is not for the exclusive use or benefit of either City or Contractor or Design-Builder, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
7. **Fragnet** – A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
8. **Gantt Chart** – A graphic display of schedule-related information. In the typical Gantt chart, schedule activities or work breakdown structure components are listed down the left side of the chart, dates are shown across the top and activity durations are shown as date-placed horizontal bars. Also known as a Bar chart.
9. **Lag** – An offset or delay from an activity to its successor. It is based on the calendar of the successor activity.
10. **Major Area** – A significant construction element.
11. **Major Procurement** – As discussed in Section 00700, paragraph 2.07.B.1, Major Procurement shall further defined as any materials that fall within the critical path and/or have a lead time of 30 days or greater.
12. **Milestone** – A key or critical point in time for reference or measurement.
13. **Network Diagram** – A graphic diagram of a network schedule, showing activities and activity relationships.
14. **Schedule Level** – Detailed Schedule by Task – This level of detail will support the short-term planning for the field, normally for those activities of less than 1-week duration. It is used for workforce supervisors to plan and coordinate work at the detail level. City must approve of any activities greater than 1 week duration.
15. **WBS (Work Breakdown Structure)** – A deliverable-oriented hierarchical decomposition of the work to be executed by the project team to accomplish the project objectives and create the required deliverables. It organizes and defines the total scope of the project. Each descending level represents an

increasingly detailed definition of the project work. The WBS is decomposed into work packages. The deliverable orientation of the hierarchy includes both internal and external deliverables. See also Schedule Levels.

16. **Work Package** – A deliverable or project work component at the lowest level of each branch of the WBS. The work package includes the schedule activities and schedule milestones required to complete the work package deliverable or project work component.
17. **Resource Loading** – WBS activities has the allocated resources necessary to complete the WBS.
18. **Schedule of Monthly Payments** – Estimated monthly progress payments based on Baseline Schedule and Schedule of Values for each Month for the duration of the project.
19. **City Activity –** An activity required by the project that will be performed by the City or their designee outside the contract.

F. **Hazardous Material Procedure Definitions**

1. **Asbestos-Containing Material (ACM)** – Mill tailings or any waste that contains commercial asbestos and is generated by a source subject to the provisions of this subpart. This term includes filters from control devices, friable asbestos waste material, and bags or other similar packaging contaminated with commercial asbestos. As applied to demolition and renovation operations, this term also includes regulated asbestos-containing material waste and materials contaminated with asbestos including disposable equipment and clothing.
2. **Adequately Wet** – Sufficiently mix or penetrate with liquid to prevent the release of particulates. If visible emissions are observed coming from asbestos-containing material (ACM), then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wetted.
3. **Competent Person** – A trained worker capable of identifying existing and predictable asbestos hazards, perform exposure assessment and monitoring, is qualified to train other workers, and has the authority to take immediate corrective action to eliminate a hazardous exposure.
4. **Friable ACM (FACM)** – Any material containing more than 1 percent asbestos, that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.
5. **Hazardous materials** – As defined by 40 CFR 261 and State-specific codes.
6. **Lead** – As defined by 29 CFR 1926.62, lead means metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.

7. **Non-friable ACM (NACM)** – Any material containing more than 1 percent asbestos, that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.
    a. **Category I NACM** – Asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos.
    b. **Category II NACM** – Any material, excluding Category I NACM, containing more than 1 percent asbestos that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.
8. **Regulated ACM (RACM)** – Any material that contains (a) FACM, (b) Category I non-NACM that has become friable, (c) Category I NACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II NACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material over the course of demolition or renovation operations. Category II NACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder in the course of work.

G. **Manufacturer's Field Service Definitions**
1. **Work-day** – One person's labor for 8 hours of work within the City and the Contractor or Design-Builder's working hours.
2. **Systems Integrator** – A contractor specializing in bringing together automation hardware and software subsystems into one system.

H. **Product Delivery Storage and Handling Definitions**
1. **Products** – Inclusive of raw materials, finished goods, equipment, systems, and shop fabrications.
2. **Special tools** – Tools that have been specifically made for use on a product for assembly, disassembly, repair, or maintenance.

I. **Record Definitions**
1. **Drawings** – As defined by Section 00700 – General Conditions
2. **Approved for Construction Drawings** – Any drawing or sketch that has been issued to the Contractor or Design-Builder by the City for the purposes of constructing the Work. These include, but are not limited to, the following: Drawings, revisions to the Drawings, information issued as part of change orders and information issued as part of work change directives.
3. **Field-Marked Drawings (Red Line Markups)** – A copy of the Approved for Construction Drawings that is maintained and updated daily by the Contractor or Design-Builder during construction clearly detailing all work completed and depicting all changes made to the Work during construction.
4. **As-Built Drawings** – The completed Field-Marked Drawings that include the signed certification language from both the Contractor or Design-Builder and Surveyor.
5. **Conforming to Construction Drawings** – The Approved for Construction Drawings that have been revised to reflect the changes noted on the As-Built

Drawings. For these drawings, the CAD files are updated, revision block is updated, and a new set of drawings is created.

6. **Record Model** – The building information model (BIM) that documents the work completed.
7. **Record Drawings** – All drawings used or developed as part of the Work. Record Drawings include, but are not limited to, the following: Approved for Construction Drawings, Field-Marked Drawings, As-Built Drawings and Conforming to Construction Drawings.
8. **Record GIS** – GIS files containing the site piping work completed in this project that has been created per KC Water Standards.
9. **Record Documents** – As defined by this Section, Section 01015 and Section 00700 – General Conditions, Article 6 Contractor or Design-Builder's Responsibilities including but not limited to updated BIM, Electronic O&M Manual, OEM O&M, Record Photos, Final Submittals, SOPs, SIs, and any other specified submittals.

J. **Selective Alterations and Demolition Definitions**

1. **Chipping hammer** – A hand-operated electrical or pneumatic demolition device for removal of hardened concrete or masonry materials having a weight of less than 15 pounds and an impact frequency of greater than 2,000 blows/minute.
2. **Concrete breaker** – A hand-operated electrical or pneumatic demolition device for removal of hardened concrete or masonry materials having a weight greater or impact frequency less than the limits defined for a chipping hammer.
3. **Coring equipment** – Non-impact rotary drill with diamond cutting edges.
4. **Heavy abrasive blast** – Cleaning procedure by which various abrasives materials, or steel shot, are forcibly propelled by high pressure against a surface to remove loose material and produce a concrete surface roughened to ICRI Surface Profile CSP-7, or higher, as specified in ICRI 301.3R.
5. **Salvage materials** – Materials removed from existing facility.

K. **Software Definitions**

1. **Computerized Maintenance Management System (CMMS)** – Facilitates process of predicted maintenance, scheduled maintenance, unscheduled maintenance, and emergency maintenance
2. **Dynamic** – Any attribute, field, item, parameter, or other component which receives an active input from a source other than by manual user.
3. **Enterprise Data Management System (EDMS)** – Inventory and management of record information kept by City.
4. **Geographic Information System (GIS)** – System that analyzes and displays geographically reference information

5. **Static** – Any attribute, field, item, parameter, or other component which requires manual edit to change its value.
6. **Supervisory Control and Data Acquisition (SCADA)** – System utilized to monitor and control processes locally and/or remotely in real time.

L. **Submittal Definitions**

1. **Shop Drawings, Product Data, and Samples** – Technical Submittals prepared by the Contractor or Design-Builder, Subcontractor, Manufacturer or Supplier and submitted by Contractor or Design-Builder to the City for review and comment as a basis of the use of Equipment and Materials proposed for incorporation in the Work or needed to describe installation, operation, maintenance or technical properties, as specified in each Division of the Specifications:
   a. Shop Drawings include custom-prepared data of all types including drawings, diagrams, performance curves, material schedules, templates, instructions and similar information.
   b. Product data includes standard printed information on materials, products and systems; not custom-prepared for this Project, other than the designation of selections from available choices.
   c. Samples include both fabricated and physical examples of materials, products and Work; both as complete units and as smaller portions of units of Work; either for limited visual inspection or (where indicated) for more detailed testing and analysis. Mock-ups are a special form of Samples which are too large to be handled in the specified manner for transmittal of Sample Submittals.
   d. Spare parts – Describe spare parts necessary for the Owner's use in facility operation and maintenance; identify the type and quantity, but include the actual characteristics of the spare parts in Product as part of the specification of the product.
   e. Tools – Tools are generally defined as items such as special wrenches, gauges, circuit setters, and other similar devices required for the proper operation or maintenance of a system that would not normally be in the Owner's tool kit.
2. **Informational Submittals** – Technical reports, administrative submittals, certificates and guarantees not defined as Shop Drawings, Product Data, and Samples.
   a. Technical reports include laboratory reports, tests, technical procedures, technical records and Contractor or Design-Builder's design analysis.
   b. Administrative Submittals are those nontechnical Submittals required by the Contract Documents or deemed necessary for administrative records. These Submittals include maintenance agreements, bonds, project photographs, physical work records, statements of applicability, copies of

industry standards, project record data, schedules, security/protection/safety data and similar type Submittals.

c. Certificates and guarantees are those Submittals on Equipment and Materials where a written certificate or guarantee from the manufacturer or Supplier is required in the Contract Documents.

d. Manufacturer's Instructions – Instructions, stipulations, directions, and recommendations issued in printed form by the manufacturer of a product addressing handling, installation, erection, and application of the product; manufacturer's instructions are not prepared especially for the Work.

M. **Survey Definitions**

1. **Brownfield** – Project locations with hazardous materials at existing in-use facilities by City.
2. **Grayfield** – Project locations with existing in-use facilities by City
3. **Greenfield** – Project locations with no in-use facilities by City.
4. **LIDAR (Light Detection And Ranging)** – Method of Surveying utilized by measuring distances using laser light and measuring reflection with a sensor. This is also called 3D Laser Scanning.
5. **Point Cloud** – A set of data points in space used for capturing existing conditions of any site.
6. **State Plane Coordinate System** – U.S. Coordinate system used by each U.S. state and has between one to six zones depending on size and shape.

N. **Water Tightness Definitions**

1. **Damp spots** – Surfaces where visible moisture can be picked up by a dry hand.
2. **Containment structure lined** – Liquid-containing structure with barrier coating or membrane applied to the inside surfaces to prevent leaking of contents to the outside.
3. **Containment structure, unlined** – Liquid containing structure where only the concrete structure itself is used to prevent leaking of contents to the outside.

1.04 ABBREVIATIONS

A. **Permit Abbreviations**

1. **MODNR** – Missouri Department of Natural Resources
2. **MS4** – Municipal Separate Storm Sewer System
3. **NPDES** – National Pollutant Discharge Elimination System
4. **OCCP** – Operational Change Control Procedure

B. Construction Progress Abbreviations

1. **WBS** – Work Breakdown Structure
2. **CPM** – Critical Path Method

C. **Asset Taxonomy**

1. Level 1 components through Level 3 components do not contain any abbreviations to select from.
2. **Level 4 – Facility / SubArea Abbreviations**
    a. **P600** – Southwest Boulevard
    b. **P601** – 25th Street Flood Station
    c. **P602** – Santa Fe Flood Station
    d. **P603** – Broadway Flood Station
    e. **P604** – North Airport Flood Station
    f. **P606** – Gillis Flood Station
    g. **P607** – Lydia Flood Station
    h. **P608** – Prospect Flood Station
    i. **P609** – Milwaukee Flood Station
    j. **P610** – Truman Flood Station
    k. **P611** – Hawthorne Flood Station
    l. **P612** – Blue Banks Flood Station
    m. **P613** – Gardner Sewage Pump Station (Out Of Service)
    n. **P614** – South Airport Flood Station
    o. **P616** – Westside Effluent Pump Station
    p. **P617** – Santa Fe Pump Station
    q. **P618** – Swope Industrial Pump Station
    r. **P619** – North Church Estates Pump Station
    s. **P620** – Blue River Effluent Pump Station
    t. **P621** – Secondary Flood Pump Station
    u. **P622** – Little Shoal Creek Pump Station
    v. **P623** – Pied Creek Pump Station
    w. **P626** – 50 Highway Pump Station (Out Of Service)
    x. **P627** – First Creek Pump Station
    y. **P628** – Second Creek Pump Station
    z. **P629** – Quail Run Pump Station
    aa. **P630** – Tiffany Green Pump Station
    bb. **P631** – First Creek Pump Station
    cc. **P632** – Second Creek Interim ForceMain
    dd. **P633** – North Bristol Pump Station
    ee. **P635** – Gooseneck Pump Station
    ff. **P637** – South Airport Relief Wells
    gg. **P640** – South Bristol Pump Station
    hh. **P641** – Tiffany Lakes Pump Station
    ii. **P642** – Wildwood West Pump Station
    jj. **P643** – New KCI Sewage Pump Station
    kk. **P646** – Briarcliff West Pump Station
    ll. **P647** – 15th Street Sewage Pump Station

mm. **P648** – Line Creek Pump Station
nn. **P649** – Riverside Sewage Pump Station
oo. **P651** – Blue River Screening/Pumping
pp. **P652** – Buckeye Pump Station
qq. **P657** – Northland Mobile Home Pump Station
rr. **P658** – NEID Pump Station
ss. **P659** – Chouteau Pump Station
tt. **P661** – Turkey Creek Pump Station
uu. **P661A** – OK Creek Gates
vv. **P662** – Riverside Horizons Pump Station
ww. **P663** – Birchwood Pump Station
xx. **P667** – 12th Street Sewage Pump Station
yy. **P668** – Old Line Creek
zz. **P669** – Round Grove Pump Station
aaa. **P671** – Gregory Pump Station (Out Of Service)
bbb. **P673** – Green Hills Pump Station
ccc. **P674** – Trolley Trail Basin
ddd. **P676** – South Airport Pump Station
eee. **P677** – Lawndale Pump Station
fff. **P678** – 87th Street Pump Station
ggg. **P679** – Delaware Diversion Structure
hhh. **P680** – Main Street Diversion Structure
iii. **P681** – Winner Road Diversion Structure
jjj. **P682** – Lake Waukomis Pump Station
kkk. **P683** – Thornhill Pump Station
lll. **P684** – White Aloe Pump Station
mmm. **P686** – Brush Creek Pump Station
nnn. **P687** – Upper Rush Pump Station
ooo. **P688** – Harlem Pump Station
ppp. **P691** – Burlington Creek Pump Station
qqq. **P692** – 83rd Street Pump Station
rrr. **P693** – Birmingham Pump Station
sss. **P694** – Mace Road Pump Station
ttt. **P696** – Weatherby Lake 2 Pump Station
uuu. **P697** – Platte Woods Pump Station
vvv. **P699** - Kemper Flood Station
www. **P701** – Blue River Primary
xxx. **P702** – Blue River Secondary
yyy. **P710** – Blue River Solids Handling
zzz. **P711** – Birmingham Wastewater Treatment Plant
aaaa. **P712** – Westside Wastewater Treatment Plant

bbbb. **P715** – Todd Creek Wastewater Treatment Plant
cccc. **P715P** – Todd Creek Wastewater Treatment Plant Pumping
dddd. **P718** – Rocky Branch Wastewater Treatment Plant
eeee. **P720** – Fishing River Wastewater Treatment Plant
ffff. **P720P** – Fishing River Wastewater Treatment Plant Pumping
gggg. **P721** – Birmingham Farm Land Application
hhhh. **P744** – KCI Industrial Park Wastewater Treatment Plant
iiii. **P745** – KCI Deicing Facility
jjjj. **P746** – Northland Mobile Homes Wastewater Treatment Plant

3. **Level 5 – System Abbreviations**
   a. **AUX** – Auxiliary
   b. **BLGR** – Buildings and Grounds
   c. **CHEM** – Chemical (Water Division Only)
   d. **DIS** – Disinfection
   e. **FILT** – Filtration/Filter Gallery (Water Division Only)
   f. **FWP** – Finished Water Process / Polishing (Water Division Only)
   g. **PMP** - Pumping
   h. **PRE** – Preliminary Treatment (Wastewater Division Only)
   i. **PRI** – Primary Treatment (Wastewater Division Only)
   j. **RWI** – Raw Water Intake (Water Division Only)
   k. **SEC** – Secondary Treatment
   l. **SOL** – Solids Handling (Wastewater Division Only)
   m. **STO** – Storage (Wastewater Division Only)
   n. **TEST** – Testing
   o. **UT** - Utilities
4. **Level 6 – Subsystem Abbreviations**
   a. **ACS** – Activated Sludge (Wastewater Division Only)
   b. **AND** – Anaerobic Digestion (Wastewater Division Only)
   c. **ARD** – Aerobic Digestion (Wastewater Division Only)
   d. **BIO** – Biotowers (Wastewater Division Only)
   e. **CENT** – Centrifuges (Wastewater Division Only)
   f. **CLA** – Clarification (Wastewater Division Only)
   g. **COM** – Communication (Wastewater Division Only)
   h. **CONV** – Conveyor Systems (Wastewater Division Only)
   i. **ELE** – Electrical (Wastewater Division Only)
   j. **FAC** – Facility (Wastewater Division Only)
   k. **GRSC** – Grit/Screening (Wastewater Division Only)
   l. **HVAC** – HVAC (Wastewater Division Only)
   m. **NaHSO3** – Sodium Bisulfite (Wastewater Division Only)
   n. **NaOCl** – Sodium Hypochlorite (Wastewater Division Only)
   o. **ODR** – Odor Control (Wastewater Division Only)

p. **PAC** – Polyaluminum Chloride (Wastewater Division Only)
q. **POL** – Polymer (Wastewater Division Only)
r. **PD** – Process Drain (Wastewater Division Only)
s. **PS** – Pumping (Wastewater Division Only)
t. **RAS** – Return Activated Sludge (Wastewater Division Only)
u. **SCADA** – Supervisory Control and Data Acquisition (Wastewater Division Only)
v. **SC** – Scum (Wastewater Division Only)
w. **SW** – Service Water (Wastewater Division Only)
x. **SDST** – Sidestream (Wastewater Division Only)
y. **SCIN** – Sludge Holding Cells (Wastewater Division Only)
z. **STM** – Steam Generation (Wastewater Division Only)
aa. **THP** – Thermal Hydrolysis (Wastewater Division Only)
bb. **UV** – Ultraviolet (Wastewater Division Only)
cc. **WAS** – Waste Activated Sludge (Wastewater Division Only)

5. **Level 7 – Equipment Abbreviations**
a. **ACTU** – Actuator
b. **AER** – Aerator
c. **AIRC** – Air Compressor
d. **BAS** – Basin
e. **BB** – Battery Bank
f. **BBC** – Battery Charger
g. **BELTPR** – Belt Press
h. **BIO** – Biogas Treatment
i. **BLDG** – Building
j. **BLOW** – Blower
k. **BP** – Backflow Preventor
l. **CAMSEC** – Cameras/Security/Monitor
m. **CHMF** – Chemical Feed
n. **CSILO** – Chemical Silo/Storage
o. **CHMUN** – Chemical Unloading
p. **CLAR** – Clarifier
q. **CLARM** – Clarifier Mechanism
r. **COMM** – Communication
s. **CMP** – Computer/System
t. **CONT** – Containment Chemicals or Oils
u. **CONV** – Conveyor
v. **CR** – Chart Recorder
w. **CRN** – Crane
x. **DHAD** – Dehumidifier/Air Dryer
y. **DGST** – Digestor

z. **DIF** – Diffusers
aa. **DIST** – Distribution (Wiring, etc.)
bb. **EDCD** – Eddy Current Drives
cc. **ELEV** – Elevator
dd. **FILT** – Filter
ee. **FLOC** – Flocculator
ff. **GATE** – Gate-Process
gg. **GEN** – Generator
hh. **GRIT** – Grit Removal Equipment
ii. **GRND** – Grounds
jj. **HOIST** – Hoist
kk. **HVAC** – HVAC Heating and Cooling
ll. **HVACN** – HVAC Conveyance
mm. **LAB** – Laboratory Equipment
nn. **LIGHT** – Lighting
oo. **MACHFX** – Machinery/Tools-Fixed
pp. **MH** – Manhole structure
qq. **MIX** – Mixer
rr. **MRAIL** – Monorail
ss. **MTR** – Motor
tt. **MTRNE** – Motor (Non-Electrical)
uu. **MCC** – Motor Control Center
vv. **OHD** – Overhead Doors (Truckbay)
ww. **OIT** – Operator Interface Terminal / Field Controls
xx. **PIPAB** – Piping-Aboveground
yy. **PIPCH** – Piping-Site/Channels
zz. **PLBG** – Plumbing
aaa. **PLC** – Programmable Logic Controller
bbb. **PORTEQ** – Portable/Mobile Equipment
ccc. **PMP** – Pump
ddd. **PMPMB** – Pumps-Mobile
eee. **PUNIT** – Pumping Unit
fff. **ROOF** – Roof
ggg. **SAFE** – Safety-Life
hhh. **SAMPLE** – Sampler
iii. **SCALE** – Scale Sensor
jjj. **SCRAIR** – Scrubber-Air
kkk. **SECPR** – Security/Process Alarm
lll. **SENS** – Sensor/Meter
mmm. **SLGCOL** – SLG Collector/Sweep Assembly
nnn. **SFTST** – Soft Starts

ooo. **SUBST** – Substations-Electrical
ppp. **SG** – Switchgear
qqq. **SWS** – Seal Water System
rrr. **TANK** -Tank
sss. **TFIL** – Trickling Filter
ttt. **TFILAR** – Trickling Filter Distribution Assembly
uuu. **TOOLPW** – Tools – Power Hand
vvv. **TRAN** – Transformer
www. **UPS** – Uninterruptible Power Supply
xxx. **UV** – Ultraviolet Equipment
yyy. **VLV** – Valve
zzz. **VFD** – Variable Frequency Drive
aaaa. **VIBRAT** – Vibrator
bbbb. **WELTNK** – Water Elevated Tank
cccc. **WRES** – Water Reservoir
dddd. **WELL** – Water Wells

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01433 - MANUFACTURERS' FIELD SERVICES

PART 1 – GENERAL

1.01 SUMMARY

A. This Section includes procedural requirements including field services for testing, startup, and training for the City of Kansas City Missouri.
B. The Contractor shall furnish all labor, materials, equipment, and incidentals as necessary to comply with these requirements.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract; including General and Supplementary Conditions, all applicable Division 1 Sections, and all applicable Division Sections; apply to this Section.
B. Related Sections include the following:
    1. Divisions 2 through 16 Sections for specific requirements for any field services and startup instructions of applicable products in those Sections.
    2. Section 01300 – Submittals.
    3. Section 01664 – Training.
    4. Section 01757 – Commissioning.

1.03 DEFINITIONS

A. Refer to Section 01420 – Definitions and Acronyms

1.04 SUBMITTALS

A. Informational submittals:
    1. Training Schedule: Submit in accordance with requirements of this Specification not less than 30 days prior to start of equipment installation and revise as necessary for acceptance.
    2. Lesson plan: Submit, in accordance with requirements of this Specification, proposed lesson plan not less than 30 days prior to scheduled training and revise as necessary for acceptance. Lesson will also be submitted and approve for training credit by the Missouri Department of Natural Resources Operator Certification Program.

1.05 QUALIFICATIONS OF MANUFACTUERER'S REPRESENTATIVE

A. Authorized representative of the manufacturer, factory trained, and experienced in the technical applications, installation, operation, and maintenance of respective equipment, subsystems, or system, with full authority by the equipment manufacturer to issue the certifications required of the manufacturer. Additional qualifications may be specified in the individual specification section.
B. Representative subject to acceptance by the City's Representative. No substitute representatives will be allowed unless prior written approval by such has been given.

PART 2 - PRODUCTS (Not Used)

PART 3 – EXECUTION

3.01 FULFILLMENT OF SPECIFIED MINIMUM SERVICES

A. Furnish manufacturers' services, when required by individual specification section, to meet requirements of this section.
B. Comply with the requirements in Division 1 Section 01757– Commissioning.
C. Where time is necessary in excess of that stated in the Specifications for manufacturers' services, or when a minimum time is not specified, time required to perform specified services shall be considered incidental.
D. Contractor or Design-Builder shall schedule manufacturers' services to avoid conflict with other onsite testing in this project and other training of division personnel or manufacturers' onsite services.
E. Before scheduling services, determine the conditions necessary to allow successful testing have been met.
F. Only those days of service approved by the City's Representative will be credited to fulfill specified minimum services.
G. Contractor or Design-Builder shall coordinate manufacturer's field services with the systems integrator, so both are on-site during field services if desired by the City.
H. When specified in individual specification sections, manufacturer's onsite services shall include:

    1. Assistance during product (system, subsystem, or component) installation to include observation, guidance, instruction of Contractor or Design-Builder's assembly, erection, installation or application procedures.
    2. Inspection, checking, and adjustment as required for product (system, subsystem, or component) to function as warranted by manufacturer and necessary to furnish manufacturer's certificate of Proper Installation.
    3. Providing, on a daily basis, copies of manufacturers' representatives field notes and data to Owner.
    4. Revisiting the Site as required to correct problems and until installation and operation are acceptable to the Engineer of Record or City's Representative.
    5. Resolution of assembly or installation problems attributable to or associated with respective manufacturer's products and system.
    6. Assistance during functional and performance testing, commissioning, and system startup and evaluation.
    7. Training of Owner's personnel in the operation and maintenance of respective product as required.

3.02 MANUFACTURER'S CERTIFICATE OF COMPLIANCE

A. When so specified, a Manufacturer's Certificate of Compliance form, a copy of which is attached to this section, shall be completed in full, signed by an entity supplying the product, material, or service, and submitted prior to shipment of product or material or execution of the services.
B. City's Representative may permit use of certain materials or assemblies prior to sampling and testing if accompanied by accepted certification of compliance.
C. Such form shall certify proposed product, material, or service complies with that specified. Attach supporting reference data, affidavits, and certifications as appropriate.

D. May reflect recent or previous test results on material or product, if acceptable to the City's Representative.

3.03 MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

A. When so specified, a copy of the Manufacturer's Certificate of Proper Installation form shall be completed and signed by equipment manufacturer's representative.
B. This form shall certify signing party is a duly authorized representative of the manufacturer, is empowered by the manufacturer to inspect, approve, and operate their equipment, and is authorized to make recommendations required to ensure equipment is complete and operational.

3.04 TRAINING

A. Refer to Section 01664– Training for training requirements.

3.05 SUPPLEMENTS

A. Supplements listed below, following "End of Section", are part of this Specification.
    1. Manufacturer's Certificate of Compliance Form.
    2. Manufacturer's Certificate of Proper Installation Form.

END OF SECTION

MANUFACTURER'S CERTIFICATE OF COMPLIANCE FORM

OWNER: _____ PROJECT, MATERIAL OR SERVICE SUBMITTED: _____

PROJECT NAME: _____ PROJECT NO. _____

COMMENTS:

_____

_____

_____

_____

I hereby certify that the above referenced product, material, or service called for by the Contract for the named Project will be furnished in accordance with the applicable requirements. I further certify that the product, material, or service are of the quality specified and conform in all respects with the Contract requirements and are in the quantity shown.

Date of Execution _____ ,20 ____

Manufacturer: _____

Manufacturer's Authorized Representative (print) _____

Manufacturer's Authorized Representative (Signature) _____

MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION FORM

OWNER			EQPT SERIAL NO.	
EQPT TAG NO.			EQPT/SYSTEM	
PROJECT NO.			SPEC. SECTION	

I hereby certify that the above referenced equipment/system has been:

(Check Applicable)

☐ Installed in accordance with Manufacturer's recommendations.

☐ Inspected, checked, and adjusted.

☐ Serviced with proper initial lubricants.

☐ Electrical and mechanical connections meet quality and safety standards.

☐ All applicable safety equipment has been properly installed.

☐ Functional tests.

☐ System has been performance tested, and meets or exceeds specified performance requirements.

(When complete system of one manufacturer)

COMMENTS:

I, the undersigned Manufacturer's Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate their equipment, and (iii) authorized to make recommendations required to ensure equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

Date of Execution _____ ,20 ____

Manufacturer: _____

Manufacturer's Authorized Representative (print) _____

Manufacturer's Authorized Representative (Signature) _____

SECTION 01480 – WATER TIGHTNESS

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes hydrostatic leakage testing for concrete water-containing structures.

1.02 REFERENCES

A. Definitions.
    1. Refer to Section 01420 – Definitions and Acronyms
B. Reference standards.
    1. Section 01420 – Definitions and Acronyms
    2. Section 03300 - Cast-in-Place Concrete
    3. Section 02300 - Earthwork

1.03 DEFINITIONS

A. Definitions.
    1. Damp spots: Surfaces where visible moisture can be picked up by a dry hand.
    2. Containment structure lined: Liquid-containing structure with barrier coating or membrane applied to the inside surfaces to prevent leaking of contents to the outside.
    3. Containment structure, unlined: Liquid containing structure where only the concrete structure itself is used to prevent leaking of contents to the outside.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination.
B. Pre-installation meetings.
C. Sequencing.
D. Scheduling.

1.05 SUBMITTALS

A. Shop drawings:
    1. Description and details of each evaporation/precipitation-measuring device anticipated for use during the test.
B. Tests and evaluation reports:
    1. Results of water leakage test for each structure and for each portion of a structure designated for testing.
C. Special procedure submittals:
    1. Testing plan for each structure, or portion thereof, required to be tested.
        a. Describe methods of obtaining water for testing and of releasing water for disposal, including provisions for dechlorination if required.
        b. Include plans showing locations where measurements will be made and locations of evaporation/precipitation-measuring device.
        c. Indicate plans for filling and draining structure(s).
        d. Include schedule showing duration of test for each structure or cell to be tested, date and time for start of each test, dates and times of observations and measurements

during the test, dates and times for closeout of testing procedures, and date for submittal of final results.

2. Proposed procedures and products for repair of leaks.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL

A. Test structures and portions of structures listed in the following paragraphs for water leakage.
    1. Unless otherwise specified, the Contractor shall:
        a. Obtain all required permits for discharging testing water.
        b. Provide dechlorination of such water if required by the permits.
        c. Prepare and fill the structures.
        d. Provide access and equipment required for testing and for recording test results.
        e. Take measurements and make observations required for testing.
    2. At all times during testing, the Engineer shall have access to observe measurements by others or to make independent measurements.
B. Test all new concrete structures for water leakage:
C. Required preparation for testing is designated in this Section. Waiver of, or failure to complete preparations shall not change the testing criteria or approval criteria for the areas tested.
D. Retest structures and portions of structures until the evaluation criteria are satisfied.

3.02 TEST WATER SOURCE AND DISPOSAL

A. Water used for the first filling of the tank will be furnished by Owner.
    1. For Water Plants, Contractor shall obtain water for leakage testing from:
        a. Finished Water; or
        b. From same quality of water that will be used when structure is put into service.
            (1) Water must be discharged into the subsequent discharge process after testing is complete.
    2. For Wastewater Plants, Contractor shall obtain water for leakage testing from:
        a. Disinfected effluent between April 1 and October 31.
        b. Secondary effluent between November 1 and March 31.
B. In the event that retesting is required, Contractor shall bear the cost of refilling the tank for subsequent tests.
C. After leakage testing is complete, Contractor shall dispose of water by discharging to Primary Treatment.

3.03 PREPARATION

A. For each structure to be tested, prepare and submit a plan showing schedule and sequence of activities, method of filling, and methods of disposing of test water.
B. Sequencing requirements:
    1. Complete construction of concrete structure and cure concrete to obtain minimum specified 28-day compressive strength as specified in Section 03300 - Cast-in-Place Concrete.
        a. Do not begin tests until all portions of structure are complete and have reached their minimum specified 28-day compressive strength.

b. Do not begin tests until at least 14 days have passed since completion of the last concrete placement.

2. Complete tests before:
    a. Covering any surface of the structure with materials that might mask the location of leaks or obscure damp concrete surfaces. Such coverings include, but are not limited to basin bottom grout, masonry veneer, stucco, plaster, and other coatings.
    b. Installation of equipment, unless otherwise approved by the Engineer.
    c. Backfilling structures to elevations above the limits indicated in the following paragraphs.
3. Liners and coatings:
    a. Field-coated or installed liners and coatings shall be applied in strict conformance to manufacturer's standards.
    b. Install liners that are mechanically locked to the concrete surface during placement of plastic concrete and before leakage testing.
        (1) Examine liners for pinholes, tears, and partially fused splices, complete all required liner integrity testing, and make required repairs before commencing leakage testing.
    c. Unless otherwise specified, do not install surface-applied protective or decorative coatings and linings until leakage tests have been completed.

C. Weather requirements:
1. Tests on structures with tops open to the atmosphere shall not be scheduled for periods when the 10-day weather forecast indicates a substantial change in weather patterns.
2. Measurements of water surface levels in the structure shall not be scheduled for periods when the weather forecast indicates a difference of more than 35 degrees Fahrenheit between the ambient temperature readings at the times of initial and final measurements.
3. Tests shall not be scheduled for periods when the 10-day weather forecast indicates that the water surface may freeze before the test is complete.

D. Groundwater requirements:
1. Bring groundwater to a level not higher than 3 feet below the bottom of the structure and maintain at that level for the duration of the test.

E. Clean interior of structure:
1. Remove dirt, contaminants, and construction debris.
2. Flush floors and sumps to provide clean surfaces.
3. Remove standing water that would interfere with examination of surfaces, cracks, or joints.

F. Observe the structure, or portions of the structure being tested, for potential leak locations.
1. Give particular attention to cracks, open joints, voids, and honeycombed and repaired surfaces.
2. Visually observe openings, fitting, and pipe penetrations in the structure at both faces, if possible.
3. Repair potential leak locations in accordance with these Specifications and as approved by the Engineer.
4. Backfill excavations to the top of the structure foundation. Do not place backfill against water-bearing walls or over footings unless approved in advance by the Engineer.
    a. If requesting backfilling of walls before testing, include a description of methods that will be used to detect leakage in the backfilled areas.

b. Engineer's approval of backfilling before testing shall not relieve Contractor of the responsibility to conduct leakage tests, to satisfy the leakage acceptance criteria for the structure, or to repair leaking portions of the structure, including those portions below or behind the backfill.

5. See Drawings and Section 02300 - Earthwork for requirements to provide wall stability before backfilling.

G. Inlets to/outlets from the structure:
   1. Inlets to and outlets from the structure shall be watertight.
      a. Include valves, sluice, and/or slide gate valves and temporary bulkheads as required.
      b. Inlets and outlets not required to be operable may be temporarily sealed before testing the compartments to which they open.
      c. Secure inlets used to fill the structure for testing to ensure that no water is entering or leaving the structure once it has been filled to the test level.
   2. Adjustments to measured leakage at inlets and outlets based on manufacturers or Contractor's estimates will not be allowed.
      a. Adjustments to measured leakage may be permitted by the Engineer, and, at their discretion, only when the Contractor makes specific measurements of leakage at each individual inlet and outlet using methods approved by the Engineer.

3.04 HYDROSTATIC LEAKAGE TEST FOR OPEN OR COVERED CONTAINMENT STRUCTURES

A. Isolate sections of water-holding structures that can be isolated in actual operation. Fill and test sections for leakage separately.
   1. Fill structures and sections of structures scheduled for testing to the normal operating water level indicated on the Hydraulic Profile indicated on the Drawings.
B. Initial rate for filling of structures shall not exceed 8 feet in 24 hours.
C. HST-100 testing includes 2 parts, "Qualitative Testing," and "Quantitative Testing," as described in the following paragraphs:
   1. HST-100, Part 1 - Qualitative Testing:
      a. During the first 24 hours after structures are filled, examine exposed concrete surfaces for damp spots or flowing water.
         (1) Make observations in early morning, at midday, and in late afternoon.
         (2) Continue observations through the duration of the Quantitative Testing period.
         (3) Pay particular attention to conditions at joints, honeycombed areas, cracks, and repaired portions of the structure.
      b. Evaluation criteria:
         (1) The structure shall be considered to have failed these Qualitative Testing requirements if any of the following conditions are observed.
            (a) Water droplets or moist areas on an outside surface that could only have originated inside the structure.
            (b) Water is flowing or seeping from joints, cracks, or surfaces.
               (i) Exception: Dampness or wetness on top of a footing, in the absence of flowing water, shall not be considered as failure to meet this criterion.

(c) Moisture can be transferred to a dry hand from the outside surfaces of the filled area.

c. Repairs and retesting:
   (1) Where damp spots or flowing water as described in the preceding paragraphs are observed, mark locations, provide repairs, and retest the structure as specified in subsequent paragraphs.

2. HST-100 - Part 2: Quantitative Testing:
   a. If approved by the Engineer, Quantitative Testing may begin before repairs are made to areas failing Part 1 of this test; however:
      (1) Adjustments to volume loss calculations of Quantitative Testing based on observed leakage will not be permitted.
      (2) All defects identified for repair during Qualitative Testing shall be repaired to the satisfaction of the Engineer before approval of the structure.
   b. Report the results of Quantitative Testing on "Leakage Test Report" included as Figure A at the end of this Section, or similar form prepared by the Contractor and containing at least the information included in Figure A.
   c. Unlined concrete structures:
      (1) Fill to the designated water surface elevation. Maintain that level for at least 72 hours before recording initial water levels for leakage test.
      (2) Duration of test:
         (a) Theoretical time required to lower the water surface in the structure by 3/8 inch when leakage is occurring at the maximum allowable rate specified in subsequent paragraphs of this Section.
         (b) The duration ("D") of the test in days is determined by the following equation:

$$D = \frac{.375\ inches}{0.005\ in/in/day\ \times H\ ft\ \times 12\ in/ft}$$

$$Where\ H = Maximum\ Liquid\ Depth$$

            (i) Round results upward to the next full 24-hour period (day).
            (ii) Minimum duration of test: 24 hours (1 day).
            (iii) Maximum duration of test: 120 hours (5 days).
   d. Lined concrete structures and secondary containment areas:
      (1) Fill to the designated water surface elevation. Recording of water levels for leakage tests may begin as soon as the designated water surface level is reached and the water surface is calm. 2) Duration of test: 72 hours (3 days).
   e. Measurements: Water level:
      (1) Record water levels at 24-hour intervals for the full duration of the test period.
      (2) Measure water levels at not less than 2 locations on opposite ends of the structure, and preferably at 4 locations spaced equally around the structure. Mark locations on the structure and take measurements at the same locations throughout the duration of the test.
      (3) Measure, to an accuracy of 1/16 inch, the vertical distance to the water surface from a fixed point on the structure above.

f. Measurements: Temperatures:
    (1) As part of the first and last sets of level measurements, record water temperature at a depth of 18 inches below the water surface. Measure temperature at the same locations where level measurements are taken.
    (2) Record ambient temperature at the time of each water level measurement.
g. Measurements: Evaporation and precipitation:
    (1) Measure evaporation and precipitation by floating pans inside the structures during testing.
        (a) For uncovered structures, measure both evaporation and precipitation.
        (b) For covered structures that are well ventilated, measure evaporation.
    (2) Measure using specially constructed clear containers:
        (a) Provide clear plastic, calibrated, open-top containers not less than 18 inches in diameter and 18-inches deep.
        (b) Partially fill containers with water and float inside the structure. Make provisions to hold containers in place at each measurement location, but away from structure walls and items passing overhead, such as beams or pipes.
        (c) Measure initial depth of water in each device. Measure changes in water level in each device at the same time measurements of the water level inside the structure are taken.
h. Restart of test:
    (1) The Engineer may order a restart of the test when, in the Engineer's opinion, measurements have become unreliable due to unusual precipitation or other factors.
    (2) If measurements or observed leakage during the testing period indicate that the allowable leakage requirements will be exceeded, the test may be terminated before completion of the full test period. Take appropriate actions to correct problems before restarting the test.
i. Calculations of leakage test results:
    (1) For each section of the structure tested, use water surface level records to calculate average loss of volume per 24-hour interval.
        (a) For each 24-hour interval during the test, calculate the average of all measured drops in water level around the structure.
        (b) Use the average drop thus determined to calculate an average loss of volume for each 24-hour interval.
    (2) Adjustments to leakage calculations:
        (a) For uncovered basins, calculations shall be corrected for precipitation added to the structure.
        (b) Calculations may be corrected for evaporation and water temperature.
j. Evaluation criteria:
    (1) Unless otherwise specified, the average loss of volume during any 24-hour interval shall not exceed the limits shown in Table A.

Table A - Loss of Volume Criteria for Leakage Tests	
Structure Type	**Maximum Loss of Water Volume**
• Structure fully lined prior to leakage test. • Secondary containment areas.	No measurable loss over 72-hour test period.
• Structure with monolithically placed membrane floor slab.	0.0125 percent of volume per 24-hour period.
• Concrete paved canals, drying beds, lagoons, and similar structures.	0.100 percent of volume per 24-hour period.
• Other containment structures.	0.050 percent of volume per 24-hour period.

k. Repairs and retesting:
   (1) Structures and portions of structures that have satisfied the qualitative requirements of HST-100, but have failed to satisfy the quantitative requirements of HST-100 may be immediately retested for volume loss.
      (a) If the structure fails the second test for volume loss, the structure shall be drained, and the Contractor shall observe the interior for probable areas of leakage.
      (b) The structure shall not be retested until repairs to the probable areas of leakage are complete.

3.05 REPAIRS FOR RETESTING

A. Locations showing damp spots or flowing water:
   1. Mark locations of visible leaks and damp spots.
   2. Drain structures for repair.
   3. Repair defects causing damp spots and flowing water using methods specified in Section 03300 - Cast-in-Place Concrete and approved by the Engineer.
      a. Repair both interior and exterior surfaces and make structures watertight.
      b. Submit proposed repair products and procedures for Engineer's review.
      c. Refill structures for retesting.
   4. Repeat filling, observations, and repairs until no leaks or damp spots appear.
B. Structures for which loss of water volume loss exceeds the limits specified after adjustments for evaporation, and precipitation:
   1. Determine cause of volume loss.
   2. Drain structures of water.
   3. Repair defects causing loss of water volume using methods specified in Section 03300 - Cast-in-Place Concrete and approved by the Engineer.
      a. Submit proposed repair products and procedures for Engineer's review.

4. Refill water-holding structures.
5. Repeat testing and repairs until volume loss does not exceed specified limits.

End of Section

FIGURE A

WATERTIGHTNESS TEST REPORT

PROJECT: _____ SUBMITTED BY:

STRUCTURE: _____ WITNESSED BY:

AREA: _____ TEST DATES:

TEST DURATION: TEST DURATION:

Surface area of structure tested: _____ (square feet)

Volume of structure tested: _____ (cubic feet)

Volume of structure tested: _____ (gallons)

Measured loss through gates, etc.: _____ (gallons / day)

Allowable loss of water volume: _____ (per day)

Allowable loss of water volume: _____ (% in 24 hours) Allowable

measured loss over test duration (inches): _____

Measured loss of water: _____ (gallons / day - From E below)

Measured loss of water volume (%): _____ (in 24 hours - From E below)

Water Temperature: Start of test: °F End of test: °F

			Water Surface Elevation (top of structure to top of water)				
			Location #1	Location #2	Location #3	Location #4	Initials**
Day	Date	Time	(inches)	(inches)	(inches)	(inches)	
1							
2							
3							
4							
5							
Changes in Level:							

A. Average change in level (feet): (Average of total charges for all locations)

B. Correction for precipitation:
(Measured from pan)

C. Correction for evaporation: (Measured from pan)

D. Corrected change in level (CL):

E. Total days tested:

Average measured % water loss in 24 F. hours: = (CL) x (surface area) x 100 / (initial water volume) x (number of test days)

Notes and field observations□□

□□ Place date and initials at the beginning of each entry

SECTION 01500 – TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 SUMMARY

A. This specification covers the requirements for temporary construction facilities required on all projects.

1.02 SPECIFICATION MODIFICATIONS

A. It is understood that throughout this section these Specifications may be modified by appropriate items in Section 01015 – Specific Project Requirements or as otherwise indicated on the Contract Drawings.

1.03 RELATED SECTIONS

A. Section 01000 – General Project Requirements.
B. Section 01300 – Submittals.

1.04 CODES AND STANDARDS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
B. National Fire Protection Association:
   1. NFPA 10 - Standard for Portable Fire Extinguishers.
   2. NFPA 70 - National Electric Code.
   3. NFPA 241 - Standard for Safeguarding Construction, Alternation and Demolition Operations.

1.05 INFORMATION PROVIDED BY THE CITY

A. As provided in the Contract Documents.

1.06 SUBMITTALS

A. Submit as specified in Section 01300 – Submittals.

1.07 QUALITY ASSURANCE

A. The Contractor is responsible for the quality assurance and quality control of the Work.
B. Regulations – Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:
   1. Building Code requirements.
   2. Health and safety regulations.
   3. Utility company regulations.
   4. Police, Fire Department and rescue squad rules.
C. Standards:
   1. Comply with NFPA 10 and 241 and ANSI A10 Series standards “Temporary Electrical Facilities.”
   2. Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70.
D. Inspections – Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 OFFICE

A. Stationary Office – Contractor shall maintain a suitable stationary office at or near the Site during the performance of the Work.

B. Assigned Vehicle – Contractor will be allowed to use an assigned vehicle in lieu of a stationary office under the following conditions.
   1. There is only one (1) trade/discipline on-site at a time.
   2. There are less than three (3) trades required to complete the Project.
   3. The construction of the project is less than three (3) month duration.
   4. The Resident Project Representative already has a stationary office within the Water/Wastewater Facility.

C. The office shall serve as the headquarters of the Contractor's representative authorized to receive Contract Documents, instructions, other communication or articles associated with the Work.

D. Any communication given to the Contractor's representative or delivered to Contractor's office at the site of the Work shall be deemed to have been delivered to Contractor.

E. Copies of the Contract Documents shall be kept at the office and shall be available for use at all times.

3.02 FIELD OFFICE FOR RESIDENT PROJECT REPRESENTATIVE

A. Contractor shall provide a separate field office for the Resident Project Representative.

B. Separate field Office shall be located on Site with the following minimum requirements:
   1. 150-square-foot minimum, with minimum dimension of 8 feet.
   2. Secure entrance doors – one set of keys.
   3. Windows with blinds and operable sash and insect screens.
   4. Lockable storage closet.
   5. Resilient floor covering.
   6. Furnishings:
      (a) One (1) standard size desk with three (3) drawers, swivel desk chair with arms.
      (b) One (1) four foot by eight foot (4' x 8') conference table.
      (c) One (1) plan rack to hold a minimum of six (6) racks of Drawings.
      (d) One (1) standard four-drawer legal-size metal filing cabinet with lock and key.
      (e) Six (6) linear feet of bookshelves, 10-inch minimum depth.
      (f) Minimum of six (6) office chairs.
      (g) One (1) waste basket per desk and table.
      (h) One (1) tack board, 36" x 30"
   7. Services:
      (a) Lighting: 50 foot-candles (538 lux) at desktop height. Exterior lighting at entrance door.

(b) Heating and air conditioning.
(c) Electrical Service: Minimum of two circuits, 110V, 60Hz. Minimum of four (4) 110V duplex convenience outlets.
(d) Outdoor toilet facilities with toiletries.
(e) Weekly cleaning service for trailer/office and toilet facilities.
(f) Electric water cooler.
(g) 30 bps internet service

3.03 UTILITIES

A. Provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions and not violate applicable codes and standards.
B. Power:
   1. All power for lighting, operations of the Contractor's plant/equipment or for any other use which may be required for proper completion of the Work shall be provided by the Contractor.
   2. Temporary heat and lighting shall be maintained until the Work is accepted.
C. Telephone/internet service:
   1. Contractor shall make all necessary arrangements and pay all installation and monthly charges for telephone/internet service for the temporary office at the site and shall provide all required devices for such service.
D. Sanitary Facilities:
   1. Contractor shall furnish temporary sanitary facilities at the site, as provided herein, for the needs of all construction workers and others performing work or furnishing services on the Project.
   2. Sanitary facilities shall be of reasonable capacity, properly maintained throughout the construction period and obscured from public view to the greatest practical extent. If toilets of the chemically treated type are used, at least one toilet will be furnished for each 20 persons. Contractor shall enforce the use of such sanitary facilities by all personnel at the site.
   3. Ventilate the units to control odors and fumes and empty and clean them at least once a week or more often if required by the City. The doors shall be self-closing. Locate the facility behind the construction fence or out of the public view.

3.04 SECURITY

A. See Section 01000 – General Project Requirements – SECURITY regarding the requirements for security.

3.05 PARKING

A. See Section 01000 – General Project Requirements – PARKING regarding the requirements for parking.

END OF SECTION

SECTION 01565 - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.01 SUMMARY

A. The Contractor shall provide the following:
    1. All labor, materials, and incidentals as necessary to comply with these requirements and to remove all ACM as specified.
    2. The equipment and safety provisions required for protecting workers while handling asbestos-containing material (ACM) except for respiratory protection.
    3. The disposal of Regulated Asbestos Containing Materials (RACM). Disposal includes packaging of RACM. Disposal may be accomplished either by land filling at an appropriately permitted facility or converting RACM to non-Asbestos waste.
    4. Obtaining permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements known to the OWNER and associated with codes, regulations, and standards. Obtain all necessary permits for disposal of ACM at no additional cost to the OWNER.
B. The Contractor shall comply with specifications herein and adherence to work practices, procedures and requirements set forth in all applicable Federal, State and local regulation. Applicable codes, regulations and standards take precedence, when available.
C. The Contractor shall coordinate all activities with Kansas City Missouri Air Quality Division (Health Department) as necessary.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all applicable Division Sections, apply to this section.
B. Asbestos Abatement Related Documents:
    1. (Request from City of Kansas City, MO – Water Services Department Project Manager)

1.03 SUBMITTALS

A. Submit the following to the OWNER for review before starting work.
    1. Certified Statement: Submit certified statement to be notarized-signed by an officer of the abatement contracting firm stating which exposure measurements, medical surveillance, and worker training records are being kept in conformance with 29 CFR 1926.
    2. Copy of the CONTRACTOR's or subcontractors current Missouri State Registration for Asbestos Contractors issued by the Missouri Department of Natural Resources (MDNR).
    3. Copy of State and/or local license for waste transport subcontractor.
    4. Name and address of landfill where RACM are to be disposed. CONTRACTOR to include contact person and contact's telephone number.
    5. Chain of Custody Form and Form of Waste Manifest proposed for use.
    6. Sample of disposal bag and any added labels to be used.
    7. Material Safety Data Sheet: Submit Material Safety Data Sheets, or equivalent, in accordance with the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR 1910.1200) for the following:
        a. Surfactants
        b. Encapsulants
        c. Solvents

8. Surfactant: Submit product data, use instructions and recommendations from manufacturer of surfactant intended for use. Include data substantiating that material complies with requirements.

B. On a weekly basis, submit copies of all waste manifests and disposal tickets to OWNER.

C. Waste Shipment Record: Maintain a waste shipment record as required by the National Emission Standards for Hazardous Air Pollutants (NESHAP) regulation which indicates the waste generator, transporter, and disposal site; and describes the nature, size, type of container, and form of asbestos waste. Submit to OWNER within 30 days of departure from building.

D. Submit for the OWNERs records, copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with compliance to standards and regulations bearing upon performance of the Work including:
   1. State and Local Regulations: Submit copies of codes and regulations applicable to the Work.
   2. Submit notices required by Federal, State and local regulations together with proof of timely transmittal to agency requiring the notice.
   3. Submit copies of current valid permits required by state and local regulations.
   4. Submit copies of all Federal, State and local licenses and permits necessary to carry out the Work.

1.04 CODES, REGULATIONS AND STANDARDS

A. Except to the extent that more explicit or more stringent requirements are written directly into the Contract Documents, all applicable Federal, State and local codes and regulations have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies are bound herewith.

B. The CONTRACTOR shall assume full responsibility and liability for the compliance with all applicable Federal, State and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The CONTRACTOR is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State and local regulations. The CONTRACTOR shall hold the OWNER and ENGINEER harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of the CONTRACTOR, the CONTRACTOR's employees, or subcontractors.

C. Federal Requirements that govern asbestos abatement work, and transportation and disposal of asbestos waste materials include but are not limited to the following:
   1. OSHA United States Code of Federal Regulations (CFR) including, but not limited to:
      a. Title 29 – Labor:
         (1) 1910 – Occupational Safety and Health Standards
            (a) 1910.1001 – Asbestos
            (b) 1910.132 – General Requirements
            (c) 1910.134 – Respiratory Protection
            (d) 1910.145 – Specifications for Accident Prevention Signs and Tags
            (e) 1910.146 – Permit-Required Confined Spaces
         (2) 1926 – Safety and Health Regulations for Construction
            (a) Part 1926.1101 – Asbestos
            (b) Part 1926.103 – Respiratory Protection
            (c) Part 1926.95-107 – Personal Protective and Life Saving Equipment
            (d) 1926.33 – Access to Employee Exposure and Medical Records

(e) 1926.59 – Hazard Communication
(f) 1926.20-35 – General Safety and Health Provisions

b. Title 49 – Transportation:
(1) Part 171 – General Information, Regulations, and Definitions
(2) Part 172 – Hazardous Materials Table, Special Provisions, hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans
(3) Part 171-180 – General Awareness and Training Requirements for Handlers, Loaders and Drivers, and Editorial and Technical Revisions

2. United States Environmental Protection Agency (USEPA) including, but not limited to:
a. Title 40 – Protection of Environment:
(1) Part 763, Subpart G – Asbestos Worker Protection
(2) Part 763, Subpart E – Asbestos Hazard Emergency Response Act (AHERA)
(3) Part 763, Subpart E, Appendix C – Asbestos Model Accreditation Plan (MAP)
(4) Part 61, Subpart A – National Emission Standards for Hazardous Air Pollutants, General Provisions
(5) Part 61, Subpart M – National Emission Standards for Hazardous Air Pollutants, National Emission Standard for Asbestos

3. State Requirements which govern asbestos abatement work or transportation and disposal of asbestos waste materials include, but are not limited to:
a. Missouri State Law − Chapter 643, Air Conservation
b. Missouri Code of State Regulations (CSR) − 10 CSR 10-6, Air Quality Standards, Definitions, Sampling and Reference Methods and Air Pollution Control Regulations for Entire State of Missouri.

4. Abide by all local requirements which govern asbestos abatement work or hauling and disposal of asbestos waste materials.

1.05 NOTICES

A. USEPA

1. Postmark or Deliver Written Notification as required by USEPA NESHAP Asbestos Regulations (40 CFR 61, Subpart M) to the regional Asbestos NESHAP Contact at least 20 working days prior to beginning any work on asbestos containing materials (ACM). Send notification to the following address with a copy to WSD Project Manager:

Air Quality Program, Health Department
Suite 3000, 2400 Troost
Kansas City, Missouri 64108
(816) 983-4301

2. Include the following information in the notification sent to the Air Quality Program:
    a. Indication whether the notification is the original or revised notification.
    b. Name, address, and telephone number of Owner or operator.
    c. Name, address, and telephone number of Contractor.
    d. Type of Operation (demolition or renovation).
    e. Description of the facility or affected part of the facility being demolished or renovated, including the size (square feet, number of floors), age, present and prior use of the facility.
    f. Estimate of the approximate amount of RACM to be removed from the facility in terms of linear feet of pipe, and square feet of surface area for other facility components. Also estimate the approximate amount of Category I and Category II non-friable ACM (NACM) in the affected part of the facility that will not be removed before demolition.
    g. For facilities in which the amount of friable asbestos materials is less than 260 linear feet on pipes and less than 160 square feet or 35 cubic feet if the length and width could not be measured. On other facility components, explain techniques of estimation.
    h. Location and street address (including building number or name and floor or room number, if appropriate), city, county, and state of the facility being demolished or renovated.
    i. Scheduled starting and completion dates of asbestos removal work (or any other activity, such as site preparation that would break up, dislodge, or similarly disturb asbestos material) in a demolition or renovation; planned renovation operations involving individual nonscheduled operations shall only include the beginning and ending dates of the report period as described in paragraph (a)(4)(iii) of 40 CFR 61.145.
    j. Scheduled starting and completion dates of demolition or renovation.
    k. Nature of planned demolition or renovation and method(s) to be used, including demolition or renovation techniques to be used and description of affected facility components.
    l. Procedures to be used to comply with the requirements of NESHAP Asbestos Regulations (40 CFR 61 Subpart M).
    m. Name and location of the waste disposal site where the asbestos containing waste material will be deposited.
    n. A certification that at least one person trained as required by paragraph (c)(8) of 40 CFR 61.145 will supervise the stripping and removal described by this notification.
3. For emergency renovations described in paragraph (a)(4)(iv) of 40 CFR 61.145, the date and hour that the emergency occurred, a description of the sudden, unexpected event, and an explanation of how the event caused an unsafe condition, would cause equipment damage, or an unreasonable financial burden.
    a. Description of procedures to be followed in the event that the unexpected RACM is found or Category II NACM becomes crumbled, pulverized, or reduced to powder.
    b. Name, address, and telephone number of the waste transporter.

1.06 STATE AND LOCAL AGENCIES

A. Send written notification as required by State and local regulations prior to beginning any work on ACM.

1.07 PERMITS

A. All ACM is to be transported by an entity maintaining a current "Industrial waste hauler permit" specifically for ACM, as required for transporting of waste ACM to a disposal site.
B. CONTRACTOR is responsible for obtaining any demolition, building, renovation or other permits, and for paying application fees, if any, where required by State or Local jurisdictions.

1.08 LICENSES

A. Licenses: Maintain current licenses as required by applicable Federal, State and/or local jurisdictions for the removal, transporting, disposal or other regulated activity relative to the Work in this contract.

1.09 POSTING AND FILING OF REGULATIONS

A. Post all notices required by applicable federal, state and local regulations. Maintain two (2) copies of applicable federal, state and local regulations and standard. Maintain one copy of each at job site and one copy on file in Contractor's office.

1.10 WORKER TRAINING

A. AHERA Accreditation: All workers are to be accredited Abatement Workers as required by the USEPA MAP Asbestos Abatement Worker Training (40 CFR Part 763, Subpart E, Appendix C).
B. State and Local License: All workers are to be trained, certified and accredited as required by State of Missouri.
C. Training - Class I: Complete in accordance with 29 CFR 1926.1101. Provide training for all workers who will perform Class I operations that is the equivalent in curriculum, training method and length to the USEPA MAP asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).
D. Training - Class II Intact (Non-Friable): Provide training for workers who will be performing Class II work involving only the removal and/or disturbance of one generic category of building material, such as roofing materials, flooring materials, siding materials or cement asbestos panels, which includes at a minimum, the specific work practices and engineering controls which specifically relate to that category. Provide a course that includes "hands-on" training and takes at least 8 hours. Provide training that includes the elements set forth in 29 CFR 1926.1101(k) and the Compliance Directive CPL 2-2.63.
E. Training - Class II Non-Intact (Friable): Provide training for workers who will be performing Class II work on materials that are friable or will become friable during the work that is the equivalent in curriculum, training method and length to the USEPA MAP asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).
F. Competent Person: Competent Person for work on removal of ACM must be trained as required by OSHA regulation 29 CFR 1926.1101(k)(9) and 1926.32(f); and as set forth in the Compliance Directive CPL 2-2.63 Appendix D page D-22 to D-23.

PART 2 - PRODUCTS

2.01 PROTECTIVE CLOTHING

A. General. Provide and require the use of protective clothing, to include coveralls or similar whole-body clothing, head coverings, gloves, and foot coverings for any employee exposed to airborne concentrations of asbestos that exceed the total weight average (TWA) and/or excursion limit prescribed by 29 CFR 1926.1101 or for which a required negative exposure assessment is not produced, and for any employee performing Class I operations which involve the removal of over 25 linear or 10 square feet of thermal system insulation (TSI) or surfacing ACM or presumed ACM.
B. Coveralls: Provide disposable full-body coveralls and disposable head covers. Contractor will require that they be worn by all workers in the Work Area. Provide a sufficient number for all required changes, for all workers in the Work Area.
C. Additional Protective Clothing: Provide each worker with the protective clothing as required by Federal, State and local regulations, including but is not limited to, hardhats, cold weather gear, gloves, boots and goggles.
D. Disposable coveralls, head covers, and footwear covers shall be provided by the Contractor for the Owner, Engineer and other authorized representatives who may inspect the job site as needed.

2.02 MATERIALS

A. Provide 6-millimeter (mil) thick leak-tight polyethylene disposal bags with three labels showing the following text. **Peel and stick type labels are prohibited.**
    1. First Label: Provide in accordance with 29 CFR 1910.1200(f) of OSHA's Hazard Communication standard:
    "DANGER CONTAINS ASBESTOS FIBERS AVOID CREATING DUST CANCER AND LUNG DISEASE HAZARD BREATHING AIRBORNE FIBERS IS HAZARDOUS TO YOUR HEALTH".
    2. Second Label: Provide in accordance with U. S. Department of Transportation regulation on hazardous waste marking. 49 CFR parts 171 and 172. Hazardous Substances
    "RQ-ASBESTOS WASTE CLASS 9 NA2212-PG III".
    3. Third Label: Provide the name of the waste generator (Owner's name), the location from which the waste was generated and the names and addresses of the transporter. This label must be durable, able to repel dirt and moisture (e.g., permanent marker). Label must be placed directly on disposal bag(s) in a legible format.
B. Polyethylene Sheet: Provide flame resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6-mil thick, frosted or black as indicated.
C. Duct Tape: Provide duct tape in 2-inch or 3-inch widths as indicated, with an adhesive which is formulated to stick firmly to sheet polyethylene.
D. Spray Cement: Provide spray adhesive in aerosol cans which is specifically formulated to stick firmly to sheet polyethylene.
E. Fiberboard Drums: Provide heavy duty leak tight fiberboard drums with tight sealing locking metal tops.
F. Paper board Boxes: Provide heavy duty corrugated paper board boxes coated with plastic or wax to retard deterioration from moisture. Provide in sizes that will easily fit in disposal bags.

PART 3 – EXECUTION

3.01 GENERAL

A. Worker Protection
    1. Provide worker protection as required by the most stringent OSHA and/or USEPA standards applicable to the Work. The following procedures are the minimum standards to be adhered to regardless of asbestos fiber count in the Work Area.
    2. Each time the Work Area is entered remove all personal clothes in designated Changing Room provided by Contractor, and put on new disposable coverall, new head cover, and a clean respirator. Proceed through shower room to equipment room and put on work boots.
    3. Warning Signs: Near the Work Area a sign complying with requirements of the USEPA NESHAP regulation (40 CFR Part 61) shall be visible in a manner and location that a person can read the following:
    "DANGER ASBESTOS CANCER AND LUNG DISEASE HAZARD AUTHORIZED PERSONNEL ONLY RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA".
B. Transportation and Disposal of RACM
    1. All waste is to be transported by a waste transportation contractor or subcontractor with all required licenses from all state and local authorities with jurisdiction.
    2. Mix all liquid ACM waste with a blendable material so that it forms a blendable (non-liquid) form and have the concurrence of the landfill operator prior to disposal.
    3. Load all adequately wetted RACM in disposal bags or leak-tight containers. All materials are to be contained in one of the following:
        a. Two 6-mil disposal bags; or
        b. Two 6-mil disposal bags and a fiberboard drum; or
        c. Sealed steel drum with no bag.
    4. Protect interior of truck or dumpster with critical and primary barriers, as required by authorities having jurisdiction.
    5. Carefully load containerized waste in fully enclosed dumpsters, trucks or other appropriate vehicles for transport. Exercise care before and during transport, to ensure that no unauthorized persons have access to the material.
    6. Warning Signs: During loading and unloading mark dumpsters, receptacles and vehicles with a sign to comply with requirements of the USEPA NESHAP regulation (40 CFR Part 61), in a visible location that reads:
    "DANGER ASBESTOS DUST HAZARD CANCER AND LUNG DISEASE HAZARD AUTHORIZED PERSONNEL ONLY"
    7. Do not store containerized materials outside of the Work Area. Take containers from the Work Area directly to a sealed truck or dumpster.
    8. Do not transport disposal bagged materials on open trucks. Label drums with same warning labels as bags. Uncontaminated drums may be reused. Treat used drums that have been contaminated as RACM and dispose of in accordance with this specification.
    9. Advise the landfill operator or processor, at least ten days in advance of transport, of the quantity of ACM to be delivered.
    10. At disposal site unload containerized waste:
        a. At a disposal site, sealed plastic bags may be carefully unloaded from the truck. If bags are broken or damaged, return to work site for rebagging. Clean entire truck and contents using procedures set forth under Project Decontamination.
    11. Retain receipts from landfill or processor for amount of ACM disposed.

12. At completion of hauling and disposal of each load, submit copy of waste manifest, chain of custody form, and landfill receipt to Owner.

3.02 SEQUENCING

A. Isolate air intakes
    1. Shut down air handling units that draw in fresh air from any area within 30 feet of the Work Area. Seal all air intakes with 6-mil plastic sheeting.
    2. Provide horizontal or vertical extension to relocate the opening of air intakes outside or above the Work Area.
B. Install critical barriers over all openings into building or equipment within 30 feet of the Work Area. Do not cover building surfaces. Erect temporary screens of reinforced plastic sheeting as required to prevent wind carrying products of work to any entries of the building or other occupied portions of the site.
C. Do not sand, abrade or grind asbestos containing materials.
D. Airborne Fiber Levels: Maintain airborne fiber levels as set forth herein.
E. Use Manual methods which do not render asbestos containing materials "non-intact." These include the use of spud, spade, flat-blade or slicing tools, such as axes, mattocks, pry bars, spud bars, crow bars, shovels, flat-blade knives, and utility knifes, to slice, cut, strip-off, shear-under, or pry up the material.
F. Remove ACM in an intact state to the extent feasible.
G. Perform all removal work on non-intact ACM using wet methods, or that which will be rendered non-intact during removal, unless wet methods are not feasible or will create safety hazards.
    1. For removal of ACM in outside conditions, preform all removal work on non-intact asbestos containing materials when outside temperatures are warm enough that the ACM is above the phase change (glass) point. Carryout removal of ACM in a manner that will minimize pulverizing, breaking or abrading of involved materials.
    2. Wet surface with amended water. Use sufficient water to completely wet surface but not cause ponding or running of water. Cut into sections able to fit in disposal boxes as applicable. Use rotary blade to cut. Do not saw or use powered rippers. Lift sections and place in disposal boxes as applicable. Use a high-efficiency particulate air (HEPA) vacuum or wet sweep into sweep shovels to pick up debris as applicable. Bag and dispose of as specified herein.
    3. For insulation, wet insulation with amended water sufficiently to enable it to be removed in a crumbly damp mass. Remove by scraping with hoes. Dispose of insulation as a non-asbestos waste.
H. When removing with a power cutter:
    1. Continuously mist the blade of the cutting machine during use unless the competent person determines that misting substantially decreases worker safety.

2. Collect dust and debris resulting from the cutting operation:
    a. Aggregate Surface: Collect all dust resulting from the cutting operation with a HEPA dust collector or by HEPA vacuuming along cut line.
    b. Smooth Surface: Collect all dust resulting from the cutting operation with a HEPA dust collector, by HEPA vacuuming along cut line, or by gently sweeping and then carefully and completely wiping up the wetted dust and debris left along the cut line.
3. Immediately bag dust and debris resulting from the cutting operation or place in covered containers.

I. Intact ACM shall be removed from Work Area as soon as it is practical, but no later than the end of the work shift.

J. ACM that is non-intact shall be removed from the Work Area as soon as it is practical, but in any event no later than at the end of the work shift. Non-intact ACM remaining in the Work Area will be kept wet, and placed in an impermeable waste bag, or wrapped in plastic sheeting.

3.03 DECONTAMINATION PROCEDURES

A. Require all workers to adhere to the following personal decontamination procedures at a minimum whenever they leave the Work Area:
    1. Type B or C Supplied Air or Powered Air-Purifying Respirators (PAPR):
        a. When exiting area, remove disposable coveralls, disposable head covers, and disposable footwear covers or boots in the equipment room.
        b. Still wearing respirators, proceed to showers. Showering is mandatory. Care must be taken to follow reasonable procedures in removing the respirator to avoid asbestos fibers while showering. The following procedure is required at a minimum:
            (1) Thoroughly wet body including hair and face. If using a PAPR hold blower unit above head to keep canisters dry.
            (2) With respirator still in place thoroughly wash body, hair, respirator face piece, and all parts of the respirator except the blower unit and battery pack on a PAPR. Pay particular attention to seal between face and respirator and under straps.
            (3) Take a deep breath, hold it and/or exhale slowly, completely wet hair, face, and respirator. While still holding breath, remove respirator and hold it away from face before starting to breath.
            (4) Carefully wash face piece of respirator inside and out.
        c. If using PAPR, shut down in the following sequence:
            (1) Cap inlets to filter cartridges, and then turn off blower unit (this sequence will help keep debris which has collected on the inlet side of filter from dislodging and contaminating the outside of the unit). Thoroughly wash blower unit and hoses. Carefully wash battery pack with wet rag. Be extremely cautious of getting water in battery pack as this will short out and destroy battery.
            (2) Shower completely with soap and water.
            (3) Rinse thoroughly.
            (4) Rinse shower room walls and floor prior to exit.
            (5) Proceed from shower to Changing Room and change into street clothes or into new disposable work items.

B. Remote Shower: The procedures above are to be used if the decontamination facility is used as a remote shower. If a worker cannot gain direct access to the Equipment Room, require that they enter

Decontamination Unit and proceed directly through Shower Room to Equipment Room. Decontamination procedure is then completed as required above.

C. Within Work Area:
    1. Require that workers NOT eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the Work Area. To eat, chew, drink or smoke, workers shall follow the procedure described above, and then dress in street clothes before entering the non-Work Areas of the building.

END OF SECTION

SECTION 01566 – CLEANUP OPERATIONS

PART 1 - GENERAL

1.01 SUMMARY

A. The Contractor shall provide all material, labor and equipment necessary for cleanup operations. The Contractor shall maintain a neat and clean job site at all times.

1.02 RELATED SECTIONS

A. Section DB 00700 – General Conditions (Design-Build Project Delivery)
B. Section DB 00800 – Supplementary Conditions (Design-Build Project Delivery)
C. Section 00700 – General Conditions (Design-Bid-Build Project Delivery)
D. Section 00800 – Supplementary Conditions (Design-Bid-Build Project Delivery)
E. Section 01000 – General Project Requirements.
F. Section 01300 – Submittals.
G. Section 02510 – PCC Sidewalks, Driveways, Ramps.
H. Section 02930 – Seeding.
I. Section 02931 – Sodding.
J. Section 03000 – Miscellaneous Concrete.

1.03 CODES AND STANDARDS

A. Not used.

1.04 DEFINITIONS

A. Not used.

1.05 INFORMATION PROVIDED BY THE CITY

A. As provided in the Contract Documents.

1.06 SUBMITTALS

A. The Contractor shall submit as specified in Section 01300 – Submittals, if proposing alternate methods and facilities for concrete washout facilities. See paragraph 3.03.E. 3 in this Section.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SITE MAINTENANCE

A. Cleanup operations shall be conducted in accordance with Section 00700 General Conditions, Article 6 – Contractor's Responsibilities.
B. Adequate cleanup shall be a condition for the processing of the Contractor's monthly progress payment applications.
C. The Contractor shall, at all times, keep the premises from accumulations of excavated materials, waste materials and other debris resulting from the Work. Site maintenance shall include, but is not limited to, the following:
    1. The Contractor shall sweep streets daily to maintain the Site in a neat and clean condition.

2. Provide adequate trash receptacles on the Site and promptly empty when filled.
3. Conduct periodic cleanup of the Site to avoid hazards, interference with traffic or operations at the Site.
4. Keep construction materials such as pipe, forms and scaffolding neatly stacked.
5. Conduct immediate cleanup to protect the Work by removing splattered concrete, asphalt, oil, paint, corrosive liquids and cleaning solutions from all surfaces (linear construction) including walls, floors and metal surfaces (vertical construction) before the surfaces are marred.
6. Volatile wastes shall be properly stored in covered metal containers and removed from the Site daily.
7. Wastes shall not be buried on the site or disposed of into storm drains, sanitary sewers, streams or waterways. All wastes shall be removed from the site and disposed of in a manner complying with all local permits, ordinances and anti-pollution laws.
8. Overloading of trucks is prohibited to prevent spillages on all access and haul routes. The Contractor shall provide periodic inspection of traffic areas to enforce the requirements of this Section.
9. The Contractor shall prevent all excess material from washing into stream beds, storm water facilities, streets, culverts, etc.

D. All excavated material not incorporated into the Work shall be removed and disposed of by the Contractor so that the site will be left in equal or better condition than its original state.
E. Any deficiency in the quantity of material for filling depressions caused by settlement shall be supplied by the Contractor.
F. The Contractor shall remove all mobilized equipment, surplus materials, debris and temporary facilities from the site. The construction site shall be left in its original condition or better condition than before the Work commenced.
G. In addition, as directed by the City, the Contractor may be required to obtain a City approved release form, signed by the property owners affected by the Work.

3.02 DUST CONTROL

A. The Contractor shall take all reasonable measures to prevent unnecessary dust. Earth surfaces subject to dusting shall be kept moist with water or by the approved application of an approved chemical suppressant. When practical, dusty materials in piles or in transit shall be covered to prevent blowing.
B. The Contractor shall make provisions so that buildings or operating facilities that may be adversely affected by dust shall be adequately protected from dust. Existing or new machinery, motors, instrument panels or similar equipment shall be protected by suitable dust screens. Proper ventilation shall be included with dust screens.
C. Contractor shall maintain and keep all streets clean throughout the Work period. The Contractor shall perform street sweeping on a daily basis to remove dust and debris from paved areas within the Work site as well as on all access and haul routes.

3.03 CONCRETE WORK

A. See Section 02510 – PCC Sidewalks, Driveways and Handicap Access Ramps for additional requirements.
B. See Section 03000 – Miscellaneous Concrete for additional requirements.
C. Three (3) working days after all subsurface work has been completed, the contractor shall initiate the following restoration work: seed and/or sod (depending on contract

requirements and/or written agreements with property owners), replacing concrete sidewalks, curbs, gutters, driveways and other surfaces impacted by the Work.

D. Three (3) working days after the placement of concrete, the Contractor shall conduct cleanup operations related to the completed concrete work as follows:
   1. Removal of forms, backfilling of the form excavation and debris removal from streets, sidewalks and parkway areas shall be accomplished within three (3) working days after the concrete placement. The backfilled areas within one foot of new concrete shall not be compacted until the concrete has cured a minimum of five (5) days.
   2. Five (5) working days after the concrete is placed, the Contractor shall complete all joint caulking, pavement restoration, seeding and sodding. If construction is being performed during periods other than designated seeding and sodding seasons, all locations without turf cover shall be completed within ten (10) working days after the beginning of the next seeding and sodding season. Refer to Section 02930 – Seeding and Section 02931 - Sodding for additional requirements.
   3. If cleanup, backfilling, sodding, joint caulking or pavement restoration is not accomplished within the above limits, all tear-out and installation operations shall cease until these items are finished. Proceeding without these items being completed is at the sole discretion of the City.
   4. All excavated material shall be removed and disposed of by the Contractor so that the grounds will be left in equal or better condition than its original state. Any deficiency in the quantity of material for filling depressions caused by settlement shall be supplied by the Contractor.
   5. Surplus materials, equipment, tools, temporary facilities and structures shall be removed by the Contractor; all debris shall be hauled away by the Contractor and the construction site shall be left in equal or better condition than its original state. Payment of completed items on the Schedule of Values shall be subject to the completion of the cleanup operations.
   6. Tear-out and installation shall not begin if unfavorable conditions for concrete placement are forecast for the next day.
   7. All cleanup operations, as stated above, shall be completed five (5) working days after concrete placement.

E. Concrete Washout Facilities:
   1. The Contractor shall provide facilities for concrete washout to collect and retain all the concrete washout water and solids in leak proof containers.
   2. Lined wash pits or washout boxes are acceptable.
   3. Alternate methods for washout facilities may be considered by the City. The Contractor shall submit for review and approval, per Section 01300 – Submittals, the alternate methods and facilities to be used.
   4. The location of washout facilities shall be indicated on the Construction Site Plan (See Section 01000 – General Project Requirements, paragraph CONSTRUCTION SITE PLAN).
   5. Concrete washout facilities shall be inspected daily and after heavy rains to check for leaks, identify any plastic linings or sidewalls that have been damaged by construction activities and determine whether they have been filled to over 75 percent capacity.
   6. When the washout container is filled to over 75 percent of its capacity, the wash-water shall be vacuumed out or allowed to evaporate to avoid overflows.

When the remaining cementitious solids have hardened, they shall be removed from the Site.

7. Damages to the washout container shall be repaired promptly.
8. Before heavy rains, the washout container's liquid level shall be lowered or the container shall be covered to avoid an overflow during the rain storm.
9. Washout facilities shall be removed from the Site upon completion of the Work and the area restored as specified herein.

END OF SECTION

SECTION 01570 - TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 – GENERAL

1.01 SUMMARY

A. The Contractor shall provide erosion and sediment control measures for all areas within and adjacent to the Project site. The Contractor shall assume that the work is to be done under the City's General Operating Permit (Permit No: MOR100006). The Contractor does not need to make separate application to the Missouri Department of Natural Resources (MDNR).

B. Specific erosion and sediment control measures are specified in APWA 5100 and Standard Erosion and Sediment Control (ESC) Drawings. These measures shall be implemented in order to control erosion and water pollution.

C. No separate payment shall be made for Erosion and Sediment Control. The Contractor shall include in the lump sum total bid price: all labor, material and equipment necessary to comply with this Section and all other Work indicated in the Contract Documents.

1.02 DESCRIPTION

A. The Contractor shall install and maintain temporary erosion and sediment control devices prior to commencing construction operations and continue through the construction period until such time as seeding and sodding has been completed and turf is established on all graded areas.

B. The Contractor shall prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) utilizing the latest version of the City's SWPPP template to develop the plan. The plan must include a narrative of the types and appropriate uses of Best Management Practices (BMPs) for erosion and sediment control and stormwater management. The requirements of the SWPPP must be as stringent as those described in the City's General Operating Permit (No: MOR100006) and 10 CSR 20-6.200. Additionally, the SWPPP must comply with the City of Kansas City's MS4 permit.

C. Failure to control erosion and water pollution will result in the Contractor being noncompliant. Any noncompliance constitutes grounds for the following enforcement actions. The Contractor shall have 24 hours after receiving a notice of noncompliance from the City's representative (i.e. Project Manager, Design Professional, Inspector/ Representative of the City) to correct the problem. If weather conditions prevent the correction of BMPs within 7 calendar days, the reasons for the delay must be documented (including pictures) and there must be a narrative explaining why the work cannot be accomplished within the 7 day time period. The documentation must be filed with the regular inspection reports. The Contractor shall correct the problem as soon as weather conditions allow. If the Contractor fails to correct the problem after the time prescribed, the City will hire a remediation expert to fix the problem. In such an event, the Contractor shall be liable to the City for the remediation costs plus a 10 percent mark-up of the total contract price. If the Contractor continues to be noncompliant, the Director (or an authorized agent thereof) may issue a stop work order and delay any payment until control measures are properly functioning and any damage has been mitigated. In such an event, any delay to the Project schedule will result in liquidated damages assessed against the Contractor.

1.03 SPECIFICATION MODIFICATIONS

A. It is understood that throughout this section, these Specifications may be modified by appropriate items in Section 01015 – Specific Project Requirements or as otherwise indicated on the Contract Drawings.

1.04 RELATED SECTIONS

A. Section 01000 – General Project Requirements.
C. Section 01300 – Submittals.
D. Section 02200 – Earthwork.
E. Section 02575 – Surface Restoration.
F. Section 02930 – Seeding.
G. Section 02931 – Sodding.

1.05 QUALITY ASSURANCE

A. The Contractor is responsible for the quality assurance and quality control of the Work. The Work shall be performed by a contractor with a proven record of performance for similar erosion and sedimentation control work.

1.06 INFORMATION PROVIDED BY THE CITY

A. As provided in the Contract Documents.

1.07 CONTRACTOR SUBMITTALS

A. The Contractor shall submit to the City/Design Professional for review and approval, in accordance with Section 01300 – Submittals, all specifications and data covering the proposed materials to be used for erosion and sedimentation control work.
B. The Contractor shall submit the following to the City/Design Professional for review and approval prior to the preconstruction conference:
    1. The Contractor shall prepare a Stormwater Pollution Prevention Plan (SWPPP) for Projects that disturb one or more acres of land or disturb less than one acre when part of a larger Project which will disturb one or more acres over the life of the Project.
    2. The SWPPP shall meet the requirements of this Section, applicable references on the plans, the City's adopted Erosion and Sediment Control Specifications (ESCS), and all sections of the APWA-KCMO specifications that reference erosion control requirements. The Contractor shall develop, implement, and adhere to the erosion control and stormwater pollution prevention plan based upon the City's guidelines and requirements.
    3. No work can begin until the SWPPP is approved by the City/Design Professional.
    4. The Contractor shall update and maintain the SWPPP as necessary to develop ongoing site-specific control measures until final acceptance of the Project.

PART 2 – PRODUCTS

A. Unless otherwise specified in Section 01015 – Specific Project Requirements, acceptable products for Inlet Protection include the following:
    1. Gutter Buddy, Dandy Curb® or approved equal.

PART 3 – EXECUTION

3.01 SAFETY

A. Perform all work in accordance with applicable Occupational Safety and Health Administration (OSHA) standards.

3.02 PERFORMANCE

A. City Projects are covered by a general NPDES permit maintained by the Water Services Department's Storm Water Division. The Permit imposes a number of obligations including, but not limited to, the following:
   1. New Projects must be reported to the MDNR 90 days before the Project starts.
   2. Each site must have and follow a written Storm Water Pollution Prevention Plan (SWPPP). Each site must be inspected weekly and following each rain event, for compliance with the SWPPP. Written inspection reports must be kept.
   3. All personnel on site must be briefed on the requirements of the SWPPP.
   4. A copy of the SWPPP must be on site at all times.
   5. All deficient items shall be promptly corrected. In no case shall the correction period exceed two calendar days.
   6. Quarterly reports must be filed by the City with MDNR identifying and giving the status and percent complete of each Project.
   7. MDNR must be notified if hazardous substances or contaminated soil are discovered on site.

B. The Contractor shall follow the approved SWPPP, as well as all erosion control measures included in the Contract Documents and implement other BMP measures as directed by the City/Design Professional.

C. The Contractor shall prevent erosion during his operations until vegetation is re-established. The Contractor shall prepare erosion control plans and submit in writing to the City/Design Professional any proposed modifications to the plans. The proposed modifications shall describe materials that will be used and the tasks that will be performed to control runoff on the site.

D. Erosion control devices shall be in place before land is disturbed.

E. All earthen structures shall be seeded or sodded. See Section 02930 – Seeding or Section 02931 – Sodding for additional requirements.

F. Vegetation shall be established to provide adequate protection or develop other suitable means.

G. Sediment trapping devices shall been installed in the proper location prior to grading.

H. The Contractor shall establish perimeter sediment trapping measures that function properly.

I. The Contractor shall prevent sediment from leaving the site and/or from damaging adjacent property.

J. The Contractor shall prevent and or remove mud on public roads or at intersections with public roads that is related to the Project work being completed.

K. The Contractor shall provide a temporary construction entrance to reduce/eliminate the transport of mud from the construction site onto public right of ways.

L. The Contractor shall provide dust control measures for any graveled areas or exposed soil areas. See Section 01000 – General Project Requirements, paragraph DUST CONTROL for additional requirements.

M. The Contractor shall temporarily or permanently stabilize all areas with exposed soil. See Section 02930 – Seeding or Section 02931 – Sodding for additional requirements.

N. The Contractor shall adequately stabilize all finished cut and fill slopes.

O. All on-site drainage channels and outlets shall be adequately stabilized.

P. Route stream around work areas.

Q. Repair stream channel damages per the Contract Documents.

R. Provide stabilization or a temporary stream channel crossing where needed.

3.03 INSTALLATION

A. Methods, materials and maintenance shall be the sole responsibility of the Contractor. The Contractor and the City/Design Professional shall conduct weekly onsite inspections using the "Erosion and Sediment Control Checklist" provided by the Water Services Department. Remove any onsite pollutant sources (debris piles with petroleum cans, chemical containers, fueling trucks/tanks or other possible sources of pollution). Upon notification of a weather forecast with a reasonable likelihood of rain, or at the direction of the City/Design Professional, the Contractor shall construct temporary berms and install erosion control fencing as necessary to control the potential eroded sediment and prevent it from leaving the construction area. If the Contractor's construction operations are complete to the point where seeding or sodding is the major item at hand before final acceptance can be made, and seeding or sodding is out-of-season or disallowed by the City/Design Professional, the Contractor shall construct one of the following erosion control measures:

1. Incorporate the use of erosion control fencing immediately downstream of vulnerable areas that are susceptible to the formation of small streams. Maintain the erosion control devices until seeding or sodding season returns. Upon return of the sodding season, the area shall be re-graded to the lines and grades established in the Contract Drawings and sodded at the direction of the City/Design Professional. See Section 02930 – Seeding and Section 02931 – Sodding for additional requirements.
2. Terrace the ground with graded berms and incorporate the use of both temporary slope drains (See ESCS Section 10.03.4.3 and Section 02200 – Earthwork for additional requirements) and erosion control fencing (as specified in this Section). Maintain the erosion control devices until seeding or sodding season returns. Upon return of the seeding or sodding season, the area shall be re-graded to the lines and grades established in the Contract Drawings and seeded/sodded at the direction of the City/Design Professional. See Section 02930 – Seeding and Section 02931 – Sodding for additional requirements.
3. Fertilize, place seed or sod, and irrigate as directed by APWA-KCMO 2400. Maintain the erosion control devices until seeding or sodding season returns. Upon return of the seeding or sodding season the Contractor shall re-establish the grade and replace all dead seed or sod at the direction of the City/Design Professional. See Section 02930 – Seeding and Section 02931 – Sodding for additional requirements.

B. Silt fence shall be installed, inspected and maintained in accordance with APWA ESC–10.

C. Berms shall be constructed in accordance to APWA ESC–29:

1. Berms are required if the silt fence is not installed or properly maintained.
2. Inspection shall be frequent and repair or replacement shall be made promptly as needed.
3. Remove sediment deposits as necessary to provide adequate storage volume for the next rain.
4. The Contractor shall remove berms when they have served their usefulness.
5. Sediment trapped by this practice shall be uniformly distributed on the source area prior to seeding or sodding.

D. The Rock Check Dam shall be constructed, inspected and maintained in accordance to APWA ESC–15.

E. Inlet Protection. Work covered under this item consists of installing a Gutter Buddy, Dandy Curb® or equal inlet protection system for inlets and median barrier inlets without

grates. The purpose is to keep silt, sediment and construction debris out of the storm system:

1. The inlet protection system shall be a sewn fabric unit enclosing a porous structure in the form of a cylindrical tube placed in front of and extending beyond the inlet opening on both sides.
2. Place inlet protection unit on the street with aggregate pouch near the inlet it will be installed to protect.
3. For oil and sediment, place absorbent in the sock tube.
4. Center the unit against curb or median inlet opening so that the curb side of the unit creates a seal with the curb or median barrier and inlet structure. There will be approximately twelve (12) inches of the inlet protection unit overhanging on each side of the opening. If the unit is not installed in this manner, it will not function properly.
5. The Contractor shall remove all accumulated sediment and debris from in front of the unit and from the street surface in the vicinity of every installed unit after each rain event or as directed by the City/Design Professional. Dispose of the unit at an appropriate recycling or solid waste facility when the unit is no longer being used.
6. Oil and sediment. Remove and replace absorbent when near saturation.

3.04 MAINTENANCE AND REPAIR

A. The Contractor is responsible for maintaining all erosion and sediment control measures until acceptance of the Project by the City.

B. Erosion control measures showing evidence of overtopping, breaks or erosion shall be repaired or replaced with suitable materials.

C. All storm sewer inlets shall be regularly maintained so that sediment will not enter the system.

D. Repair and clean-out all control measures that are not functioning properly.

E. Remove temporary measures that are no longer needed.

F. Seeded or sodded areas requiring maintenance (fertilizer, re-sodding, re-seeding or additional mulch and watering) shall be promptly addressed. See Section 02930 – Seeding and Section 02931 – Sodding for additional requirements.

3.05 WARRANTY

A. Seeding and sodding work shall have taken root and established satisfactory coverage before acceptance by the City. The Contractor shall maintain as described in paragraph 3.04 above and shall guarantee seeding and sodding for one (1) year after acceptance. The Contractor shall scarify, re-seed or re-sod, fertilize and mulch (seeded areas) any barren area greater than 1 square foot. See Section 02575 – Surface Restoration for requirements on early acceptance.

END OF SECTION

CITY OF KANSAS CITY, MISSOURI

STORMWATER POLLUTION PREVENTION PLAN

(SWPPP)

For Capital Improvement Projects Disturbing One or More Acres

Missouri State General Operating Permit (Land Disturbance Permit) MO-R100000

(July 2022 – Jun 2027)

(Insert Project Name)

(Insert Project Site Address)

(Insert Owner Department)

(Insert Project Site Telephone Number {if applicable})

Contacts in case of spills:

For **hazardous substances releases**, under the Missouri Spill Bill, responsible parties or spillers are required to report to Missouri Department of Natural Resources 24-hour Environmental Emergency Response Spill Line at (**573) 634-2436**, or the National Response Center at (800)-424-8802.

For **non-hazardous substances releases**, should a spill or an unauthorized discharge cause or permit any contaminants, other than sediment, or hazardous substance to discharge or enter waters of the state, the unauthorized discharge must be reported to the Missouri Department of Natural Resources regional office as soon as practicable but no more than 24 hours after the discovery of the discharge. Call Kansas City Regional Office **(816) 251-0700**, or the Department's Environmental Services Program (573) 526-3315.

CERTIFICATIONS
(To be Completed by ALL PARTIES)

Design Professional's Declaration:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Design Professional: _____

Print Name: _____ Title: _____

Signature: _____ Date: _____

City's Review:

I have reviewed this SWPPP for compliance with the requirements contained in the City's Missouri State Operating Permit for land disturbance activities and have found the plan complete prior to commencement of land disturbance activities.

Owner Department: _____

Print Name: _____ Title: _____

Signature: _____ Date: _____

General Contractor's Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

General Contractor: _____

Print Name: _____ Title: _____

Signature: _____ Date: _____

Note: Name the person(s) responsible for inspection, operation, and maintenance of BMPs. The SWPPP shall list the names and describe the role of all owners/primary operators (such as general contractor, project manager) responsible for environmental or sediment and erosion control at the land disturbance site.

Subcontractors Certification:

I hereby certify that I understand the requirements stated in this SWPPP, that I am responsible for completing the requirements, which have been listed in the plan as being a part of my scope of work.

Subcontractor/Project Role: _____
Signature: _____ Title: _____
Print Name: _____ Date: _____

Subcontractor/Project Role: _____
Signature: _____ Title: _____
Print Name: _____ Date: _____

Subcontractor/Project Role: _____
Signature: _____ Title: _____
Print Name: _____ Date: _____

Subcontractor/Project Role: _____
Signature: _____ Title: _____
Print Name: _____ Date: _____

Subcontractor/Project Role: _____
Signature: _____ Title: _____
Print Name: _____ Date: _____

Subcontractor/Project Role: _____
Signature: _____ Title: _____
Print Name: _____ Date: _____

Subcontractor/Project Role: _____
Signature: _____ Title: _____
Print Name: _____ Date: _____

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PART I: GENERAL PROJECT INFORMATION
(To be completed by Owner Department or Design Professional)

1. Project Site Name: _____

Project Site Address/Location: _____

City: _____ **State:** _____ **Zip Code:** _____ **County:** _____

Section, Township, Range: _____

Project Number: _____

Owner Department: _____

Address: _____

City: _____ **State:** _____ **Zip Code:** _____

Phone: _____ **Fax:** _____

E-mail: _____ **Cell Phone**: _____

2. Record of Important Dates: fill in during construction activities.

Completed SWPPP approval	
Groundbreaking activities begin	
Stabilization measures initiated	
Permanent stabilization achieved	

3. Describe the Nature of the Land Disturbance Activity:

(a) The function of the project (e.g., low density residential, shopping mall, highway, etc.),
(b) The intended sequence and timing of activities that disturb the soils at the site; and
(c) Estimates of the total area expected to be disturbed by excavation, grading, or other land disturbance support activities including off-site borrow and fill areas.

(*Use additional sheets as necessary*)

(a)	
(b) 1)	7)
2)	8)
3)	9)
4)	10)
5)	11)
6)	12)

Estimated Project Start Date: _____

Estimated Project Completion Date: _____

(c) **Total Site Area (in acres):** _____

Estimated Total Area (in acres) to be disturbed by all activities: _____

PART II: GENERAL REQUIREMENTS (Applicable to All PARTIES)

1. Conditions for SWPPP Update

The SWPPP shall be amended and updated as appropriate during the term of the land disturbance activity. All SWPPP modifications shall be signed and dated. The SWPPP shall be amended to incorporate any significant site condition changes which impact the nature and condition of stormwater discharges. At a minimum, these changes include whenever:

(a) The location, design, operation, or maintenance of BMPs is changed;

(b) Design of the construction project is changed that could significantly affect the quality of the stormwater discharges;

(c) Site inspections indicate deficiencies in the SWPPP or any BMP;

(d) Missouri Department of Natural Resources notifies the permittee in writing of deficiencies in the SWPPP;

(e) The SWPPP is determined to be ineffective in minimizing or controlling erosion and sedimentation (e.g., there is visual evidence of excessive site erosion or sediment deposits in streams, lakes, or downstream waterways, sediment or other wastes off site); and/or

(f) Missouri Department of Natural Resources determines violations of water quality standards may occur or have occurred.

2. Record of SWPPP Update: fill in **Appendix A**

3. Restriction and Limitations

The land disturbance permit does NOT allow placement of fill material into any stream or wetland, alteration of a stream channel, or obstruction of stream flow unless authorized by a CWA Section 404 Permit, or placement of fill in floodplains unless authorized by appropriate federal and/or state floodplain development authorities.

The land disturbance permit does NOT supersede any requirement of the National Environmental Policy Act; the Endangered Species Act; the National Historic Preservation Act; the Comprehensive Environmental Response, Compensation and Liability Act; the Resource Conservation and Recovery Act; or any other relevant acts.

4. Erosion and Sediment Controls

Ensure the **design, installation, and maintenance** of effective erosion and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed, and maintained to:

(a) Control stormwater volume, velocity, and peak flow rates to minimize soil erosion;

(b) Control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion and scour;

(c) Minimize the amount of exposed soil during construction activity;

(d) Minimize the disturbance of steep slopes;

(e) Minimize sediment discharges from the site. Address factors such as:

1) The amount, frequency, intensity, and duration of precipitation;

2) The nature of resulting stormwater runoff;

3) Expected flow from impervious surfaces, slopes, and drainage features; and

4) Soil characteristics, including the range of soil particle size expected to be present on the site.

(f) Provide and maintain natural buffers around surface waters as detailed in the Permit – Part V. BMP REQUIREMENTS Condition 7, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration and filtering, unless infeasible; and

(g) Minimize soil compaction and preserve topsoil where practicable.

PART III: PROJECT PLANNING & DESIGN
(To be completed by DESIGN PROFESSIONAL)

1. General Information

Design Professional develops the initial SWPPP, including narrative description and SITE MAP (s) containing all the information as required by the MO-R100000 (effective July 2022).

Designer's Name: _____
Company Name: _____
Address: _____
City: _____ **State:** _____ **Zip Code:** _____
Phone: _____ **Fax:** _____
E-mail: _____ **Cell Phone:** _____

2. Soil Disturbing Activities:

Soil disturbing activities for this project will include the following (Check all that apply):

☐ Clearing and grubbing of existing trees
☐ Stripping of topsoil within the limits of construction
☐ Stockpiling and re-spreading
☐ Utility trench excavation and backfill
☐ Preparing sub grade for streets and sidewalks
☐ Backfilling curbs and sidewalks
☐ Disposal areas for excess excavated material
☐ Borrow areas for fill material
☐ Construction of sediment basins or storm water
☐ Construction of compacted fill areas for residential building
☐ Minimize soil compaction and preserve topsoil
☐ Provide and maintain natural buffers around surface waters
☐ Other: _____

3. Downstream Information:

Name of primary receiving water body: _____

Does this Project require 404 Permit? ☐ Permit Number: _____

☐ Water Quality Certification Number: _____

List and Describe the location of all outfalls:

Outfall Location	Receiving Waterbody	Distance to receiving waterbody
1)		
2)		
3)		
4)		
5)		

4. Determine the 2-year, 24-hour Storm Event

A 2-year, 24-hour storm event can be determined for the project location using the National Oceanic and Atmospheric Administration's National Weather Service Atlas 14 https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html, or can be determine using local rainfall distribution for a 2-year, 24 hours storm event using multi-decade local high density rain gauge data, as approved by Missouri Department of Natural Resources.

Specify the method used to determine the 2-year, 24-hour storm event for the project location:

☐ NOAA Atlas 14

☐ Based on multi-decade local high density rain gauge data, as approved by the Department

Specify the 2-year, 24-hour storm event for the project location: _____ inch

5. Authorized Non-stormwater Discharges

Authorized non-stormwater discharges associated with construction activities: check all occurring on site, and note where these discharges occur.

☐ (a) Discharges from emergency fire-fighting activities;

Where: _____

☐ (b) Hydrant flushing and water line flushing, provided the discharged water is managed to avoid instream water quality impacts;

Where: _____

☐ (c) Landscape watering, including to establish vegetation;

Where: _____

☐ (d) Water used to control dust;

Where: _____

☐ (e) Waters used to rinse vehicles and equipment, provided there is no discharge of soaps, solvents, or detergents used for such purposes;

Where: _____

☐ (f) External building washdown, provided soaps, solvents, and detergents are not used, and external surfaces do not contain hazardous substances (e.g., paint or caulk containing polychlorinated biphenyls (PCBs)

Where: _____

☐ (g) Pavement wash waters, provided spills or leaks of toxic or hazardous substances have not occurred (unless all spill material has been removed) and where soaps, solvents, and detergents are not used. Directing pavement wash waters directly into any Waters of the State, storm drain inlet, or stormwater conveyance (constructed or natural site drainage features), unless the conveyance is connected to an effective control, is prohibited;

Where: _____

☐ (h) Uncontaminated air conditioning or compressor condensate;

Where: _____

☐ (i) Uncontaminated, non-turbid discharges of ground water or spring water;

Where: _____

☐ (j) Foundation or footing drains where flows are not contaminated with process materials;

Where: _____

and

☐ (k) Uncontaminated construction dewatering water discharged in accordance with requirements found in this permit for specific dewatering activities.

Where: _____

6. Requirements for Best Management Practices (BMPs)

BMPs for land disturbance are a schedule of activities, practices, or procedures that reduces the amount of soil available for transport or a device that reduces the amount of suspended solids in runoff before discharge to waters of the state. BMPs are divided into two main categories: structural or non-structural; and they are also classified as temporary or permanent. Temporary BMPs may be added and removed as necessary with updates to the Stormwater Pollution Prevention Plan (SWPPP).

(1) Site Preservation:

(a) **EXISTING VEGETATION, TREES, AND TOPSOIL SHALL BE PRESERVED WHERE PRACTICABLE**.

(b) The disturbance of steep slopes shall be minimized.

(2) Riparian Buffer or a Structural Equivalent for Surface Waters of the State:

For surface Waters of the State, defined in Section 644.016.1(27) RSMo, located on or adjacent to the site, a riparian buffer or structural equivalent must be maintained in accordance with at least one of the following options.

(a) Provide and maintain a 50-foot undisturbed natural buffer; or

(b) Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or

(c) If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

(d) Exempt from compliance with (a), (b), or (c) above if one or more of the following exceptions apply and documentation is provided in the SWPPP:

1) As authorized per CWA Section 404 Department of the Army permit and its associated Section 401 Water Quality Certification from the Department.

2) If there is no discharge of stormwater to waters of the state through the area between the disturbed portions of the site and Waters of the State located within 50 feet of the site. This includes situations where permanent control measures have been implemented that will prevent such discharges, such as a berm or other barrier.

3) Where no natural buffer exists due to preexisting development disturbances that occurred prior to the initiation of planning for the current development of the site.

a. Where some natural buffer exists but portions of the area within 50 feet of the Waters of the State are occupied by preexisting development disturbances the permittee is required to comply with (a), (b), or (c) above.

4) For linear projects where site constraints make it infeasible to implement a buffer or equivalent provided the permittee limit disturbances within 50 feet of any Waters of the State and/or supplemental erosion and sediment controls are provided to treat stormwater discharges from earth disturbances within 50 feet of the Waters of the State. It must also be documented in the SWPPP the rationale for why it is infeasible to implement (a), (b), or
(c) and describe any buffer width retained and supplemental BMPs installed.

(e) Where the permittee is retaining a buffer of any size, the buffer should be measured perpendicularly from any of the following points, whichever is further landward from the water:

1) The ordinary high water mark of the water body, defined as the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris; or

2) The edge of the stream or river bank, bluff, or cliff, whichever is applicable.

(3) Perimeter Control:

Sediment controls shall be used along any perimeter areas of the site that are downgradient from any exposed soil or other disturbed areas. Prevent stormwater from circumventing the edge of the perimeter control. For sites where perimeter controls are infeasible, other practices shall be implemented to minimize discharges to perimeter areas of the site.

(4) Stockpile Management:

Manage stockpiles or land clearing debris piles composed, in whole or in part, of sediment and/or soil.

(a) Locate the piles outside of any natural buffers zones, established under the condition above, and away from any stormwater conveyances, drain inlets, and areas where stormwater flow is concentrated;

(b) Install a sediment barrier along all downgradient perimeter areas;

(c) Divert surface flows around stockpiles to reduce and minimize erosion of the stockpile.

(5) Sedimentation Basins:

A sedimentation basin shall be included for each drainage area with ten or more acres disturbed at one time.

(a) The sedimentation basin shall be sized, at a minimum, to treat a local 2-year, 24-hour storm.

(b) Sediment basins shall not be constructed in any Waters of the State or natural buffer zones.

(c) Discharges from dewatering activities shall be managed by appropriate controls. The SWPPP shall include a description of any anticipated dewatering methods and specific BMPs designed to treat dewatering water.

1) Appropriate controls include, but are not limited to, sediment socks, dewatering tanks, tube settlers, weir tanks, filtration systems (e.g., bag or sand filters), and passive treatment systems that are designed to remove or retain sediment.

2) Erosion controls and velocity dissipation devices (e.g., check dams, riprap, and vegetated buffers) to minimize erosion at inlets, outlets, and discharge points from shall be utilized.

Where use of a sediment basin is infeasible, the SWPPP shall evaluate and specify other similarly effective BMPs to be employed to control erosion and sediment. These similarly effective BMPs shall be selected from appropriate BMP guidance documents authorized by this permit. The BMPs must provide equivalent water quality protection to achieve compliance with this permit. The SWPPP shall require both temporary and permanent sedimentation basins to have a stabilized spillway to minimize the potential for erosion of the spillway or basin embankment.

(6) Concrete Washout Facilities:

Concrete washout facilities shall be used to contain concrete waste from the activities onsite, unless the washout of trucks and equipment is managed properly at an off-site location. The washout facility shall be managed to prevent solid and/or liquid waste from entering Waters of the State by the following:

(a) Direct the wash water into leak-proof containers or pits designed so that no overflows can occur due to inadequate sizing or precipitation;

(b) Locate washout activities away from Waters of the State, stormwater inlets, and/or stormwater conveyances where practicable. If not practicable, use BMPs to reduce risk of waste leaving the washout facility;

(c) Designate the washout area(s) and conduct such activities only in these areas.

(d) Ensure contractors are aware of the location, such as by marking the area(s) on the map or signage visible to the truck and/or equipment operators.

(7) Sediment Trackout from the Site:

Minimize sediment trackout from the site and sediment transport onto roadways.

(a) Restrict vehicle traffic to designated exit points.

(b) Use appropriate stabilization techniques or BMPs at all points that exit onto paved roads or areas outside of the site.

(c) Use additional controls or BMPs to remove sediment from vehicle and equipment tires prior to exit from facility where necessary.

(d) Stormwater inlets susceptible to receiving sediment or other pollutants from the permitted land disturbance site shall have curb inlet protection. This may include inlets off the active area where track out from vehicles and equipment could impact the stormwater runoff to those inlets.

(8) Selection of BMPs:

Appropriate BMPs shall be selected for use at the site.

(a) Stormwater volume and velocity shall be considered when selecting effective BMPs.

(b) A BMP that has demonstrated ineffectiveness in preventing or minimizing sediment or other pollutants from leaving a given site shall be replaced with a more effective BMP, or additional and sequential BMPs and treatment devices may be incorporated as site conditions allow.

(c) A schedule for performing erosion control measures shall be considered in selecting BMPs.

(d) Stormwater discharges which leave the site from disturbed areas shall pass through an appropriate impediment to sediment movement such as a sedimentation basin, sediment traps (including vegetative buffers), or silt fences prior to leaving the land disturbance site.

(9) Types of BMPs:

Check all the types of BMPs used at the site:

- ***Soil Stabilization and Slope Protection BMPs***

☐ Scheduling ☐ Hydro-seeding ☐ Earth Dikes/Swales & Lined Ditches

☐ Straw Mulch ☐ Hydraulic/Wood Mulch ☐ Outlet Protection/Velocity

☐ Slope Drains ☐ Streambank Stabilization ☐ Preservation of Existing Vegetation

☐ Soil Binders ☐ Geotextiles, ECBs or TRMs ☐ Other (specify): _____

- ***Perimeter Controls & Sediment Barriers***

☐ Silt Fence ☐ Sandbag Barrier ☐ Storm Drain Inlet Protection ☐ Fiber Rolls

☐ Sediment Traps ☐ Check Dam ☐ Sediment/Desilting Basin ☐ Gravel Bag Berm

☐ Street Sweeping and Vacuuming ☐ Direct Stormwater to vegetated areas

☐ Maintain natural buffers around surface waters ☐ Other (specify): _____

- ***Establish Stabilized Construction Exits***

☐ Stone Pads ☐ Entrance/Outlet Tire Wash ☐ Other (specify): _____

- ***Non-Storm Water Management BMPs***

☐ Pile Driving ☐ Concrete Finishing ☐ Demolition/Removal Over Water

☐ Dewatering ☐ Concrete Curing ☐ Illicit/Illegal Discharge

☐ Clean Water ☐ Paving & Grinding ☐ Vehicle & Equipment Cleaning

☐ Dust Control ☐ Water Conservation Practices ☐ Temporary Stream Crossing

☐ Material/Equipment Use Over water ☐ Vehicle & Equipment Fueling & Maintenance

☐ Other (specify): _____

- ***Waste Management & Materials Pollution Control BMPs***

☐ Spill Prevention & Control ☐ Liquid Waste Management ☐ Sanitary/Septic Waste Management

☐ Stockpile Management ☐ Concrete Waste Management (Washout Area) ☐ Hazardous Waste Management

☐ Solid Waste Management ☐ Material Delivery/Storage/Use ☐ Contaminated Waste Management

☐ Other (specify): _____

- ***Permanent Stabilization BMPs***

☐ Retaining Walls ☐ Infiltration Basins ☐ Outlet Protection/Velocity Dissipation

☐ Biofilters ☐ Vegetative Buffers ☐ Earth Dikes, Drainage Swales & Lined Ditches

☐ Porous Pavement ☐ Slope Protection ☐ Detention/Retention Devices

☐ Other (specify): _____

Note: make copies of this page if more BMP instances are to be included

(10) Description of BMPs:

Describe both structural and non-structural BMPs that will be used at the site.

(a) Provide the following general information for each BMP type which will be used one or more times at the site:

BMP Type 1:

Physical description:

Site conditions required:

Installation/construction procedures (including typical drawing):

Operation/maintenance procedures and schedules:

BMP Type 2:

Physical description:

Site conditions required:

Installation/construction procedures (including typical drawing):

Operation/maintenance procedures and schedules:

Note: make copies of this page if more BMP instances are to be included

(b) Provide the following information for each specific instance where a BMP is to be installed:

1) The BMP is temporary or permanent
2) When the BMP will be installed in relation to each phase of the land disturbance procedures to complete the project
3) Site conditions required before removal of the temporary BMP

BMP 1:

The BMP is temporary ☐, or permanent ☐.

Describe when the BMP will be installed in relation to each phase of the land disturbance procedures to complete the project:

Installation/construction procedures (including typical drawing):

Operation/maintenance procedures and schedules:

BMP 2:

The BMP is temporary ☐, or permanent ☐.

Describe when the BMP will be installed in relation to each phase of the land disturbance procedures to complete the project:

Installation/construction procedures (including typical drawing):

Operation/maintenance procedures and schedules:

7. Site Map Requirements:

Create a legible site map or multiple maps if necessary, identifying:

(a) Site boundaries of the property;
(b) Locations of all waters of the state (including wetlands) within the site and half a mile downstream of the site's outfalls;
(c) Location of all outfalls;
(d) Location of stormwater inlets and conveyances including ditches, pipes, man-made conduits, and swales;
(e) Areas of soil disturbance and areas that will not be disturbed (or a statement that all areas of the site will be disturbed unless otherwise noted);
(f) Locations of on-site and off-site material, waste, borrow, concrete washout facility, disposal of the material removed from sediment basins, equipment storage areas and stockpiles;
(g) Designated points where vehicles will exit the site;
(h) Location of structural and non-structural BMPs, including natural buffer areas, identified in the SWPPP;
(i) Direction(s) of stormwater flow (use arrows) and approximate slopes before and after grading activities;
(j) Location and timing of stabilization measures;
(k) Areas where final stabilization has been achieved;
(l) Change of a drainage course; and
(m) The sloped areas for all phases of the project.

Add the maps to Appendices C and D.

8. Resources:

The contractor must select, install, use, operate, and maintain appropriate BMPs for the permitted sites. The following manuals are acceptable resources for the selection of appropriate BMPs, but should not be considered exclusive:

- Kansas City Metro Chapter of the American Public Works Association:
  Design Guidance Documents: Division 5100 Erosion and Sediment Control manual.

  Standard Drawings: Erosion and Sediment Control Details (2/2017)
  http://kcmetro.apwa.net/Content/Chapters/kcmetro.apwa.net/File/Specifications%2FErosion%20and%20Sediment%20Control_Details_APWA%20021517.pdf

- National Menu of Best Management Practices (BMPs) for Stormwater-Construction. United States Environmental Protection Agency USEPA (1/27/2022).
  https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater-construction

- Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites. United States Environmental Protection Agency (USEPA), EPA 833-R-06-004 (May 2007).
  https://www.epa.gov/sites/production/files/2015-10/documents/sw_swppp_guide.pdf

- Developing a Stormwater Pollution Prevention Plan (SWPPP)
  https://www.epa.gov/npdes/developing-stormwater-pollution-prevention-plan-swppp

- Protecting Water Quality: A field guide to erosion, sediment and stormwater best management practices for development sites in Missouri. Missouri Department of Natural Resources. 1/7/2016
  https://dnr.mo.gov/document-search/protecting-water-quality-field-guide

PART IV: PROJECT INFORMATION
(To be completed by OWNER DEPARTMENT & GENERAL CONTRACTOR)

1. Project Contact Information

City Department: _____
Project Manager's Name: _____
Address: _____
Phone: _____ **Fax:** _____
E-mail: _____ **Cell Phone:** _____

Note: The project manager is responsible for notifying the landowner and each contractor or entity (including utility crews and city employees or their agents) who will perform work at the site, of the existence of the SWPPP, and what actions or precautions shall be taken while on site to minimize the potential for erosion and the potential for damaging any BMP. The project manager and owner department are responsible for any damage a subcontractor may do to established BMPs, and any subsequent water quality violation resulting from the damage.

General Contractor's Name: _____
Company Name: _____
Address: _____
City: _____ **State:** _____ **Zip Code:** _____
Phone: _____ **Fax:** _____
E-mail: _____ **Cell Phone:** _____

Contractor's Environmental Lead
Designated Individual: _____
Address: _____
City: _____ **State:** _____ **Zip Code:** _____
Phone: _____ **Fax:** _____
E-mail: _____ **Cell Phone:** _____

Note*:* The General Contractor must designate an environmental lead who has primary responsibility for ensuring compliance with the Storm Water Pollution Prevention Plan (SWPPP) during construction. This environmental lead shall have knowledge in erosion, sediment, and stormwater control principles, knowledge of the permit, and the site's SWPPP. The environmental lead shall ensure all personnel and contractors understand any requirements of this permit may be affected by the work they are doing. The environmental lead or designated inspector(s) knowledgeable in erosion, sediment, and stormwater control principles, shall inspect all structures that function to prevent or minimize pollution of Waters of the State.

State Contacts for Spills, Overflows, and Other Unauthorized Discharges:
Should an unauthorized discharge cause or permit any contaminants, other than sediment, or hazardous substance to discharge or enter waters of the state, the unauthorized discharge must be reported to the Missouri Department of Natural Resources regional office, **(816) 251-0700**, as soon as practicable but no more than 24 hours after the discovery of the discharge.
If the spill or overflow needs to be reported after normal business hours or on the weekend, the facility must call the Department's Environmental Emergency Response hotline at **(573) 634-2436**. Leaving a message on a Department staff member voice-mail does not satisfy this reporting requirement.

Note**:** A record of all spills shall be retained with the SWPPP and made available to the Department upon request.

Subcontractors: Check all items for which subcontractors will be used and provide a list of all the subcontractor's company names:

☐ Gas ☐ Grading ☐ Sanitary sewers ☐ Concrete flatwork ☐ Concrete drainage structures

☐ Water ☐ Blasting ☐ Storm sewers ☐ Sediment controls ☐ Seeding & Mulching

☐ Electric ☐ Paving ☐ Curb & Gutters ☐ Other (specify): _____

List All Additional subcontractors used on the project whose scope of work includes land disturbance activities (keep list updated throughout the project):

Contact Name / Project Role (including inspection, operation, and maintenance of BMPs)	**Phone Number**

Other Utilities and Contractors: List all other utility companies and contractors which will be doing work on the site with their own sub-contractors involving land disturbance:

Contact Name / Project Role	**Phone Number**

2. Sequence of Construction:

The General Contractor must complete the following intended construction sequence and timing for major activities, including any opportunities for phasing, grading and stabilization activities to minimize the overall amount of disturbed soil that will be subject to potential erosion at one time.

Phase	BMP's & Stabilization Methods
1)	
2)	
3)	
4)	
5)	
6)	
7)	
8)	
9)	
10)	
11)	
12)	
13)	
14)	
15)	
16)	
17)	

PART V: BMP PERFORMANCE REQUIREMENTS (To be Implemented by GENERAL CONTRACTOR)

1. On-site Record Keeping

(1) The SWPPP must be developed and implemented prior to conducting any land disturbance activities and must be specific to the land disturbance activities at the site.

(2) The SWPPP shall be updated any time site conditions warrant adjustments to the project or BMPs. See Part I. General Requirements – 1. SWPPP Update and 2. Record of SWPPP Update.

(3) An electronic copy or a paper copy of the SWPPP, and any required reports, must be accessible to anyone on site at all times when land disturbance operations are in process or other operational activities that may affect the maintenance or integrity of the BMP structures and made available.

(4) A log of each inspection and/or copy of the inspection report shall be kept readily accessible and must be made available upon request by the Missouri Department of Natural Resources. Electronic logs are acceptable, as long as reports can be provided within 24 hours. The inspection report shall be signed by the environmental lead or designated inspector.

(5) A record of all spills shall be retained with the SWPPP.

2. General Requirements

(1) Notification Sign:

A public notification sign shall be posted at the main entrance to the site, or a publicly visible location, with the specific MOR100 permit number. See Appendix B. for the sign. The public notification sign must be visible from the public road that provides access to the site's main entrance. An alternate location is acceptable provided the public can see it and it is noted in the SWPPP. The public notification sign must remain posted at the site until the site is finalized.

(2) Housekeeping Practices:

Good housekeeping practices shall be maintained at all times to keep waste from entering waters of the state.

(a) Provide solid and hazardous waste management practices, including providing trash containers, regular site cleanup for proper disposal of solid waste such as scrap building material, product/material shipping waste, food/ beverage containers, spent structural BMPs;

(b) Provide containers and methods for proper disposal of waste paints, solvents, and cleaning compounds.

(c) Manage sanitary waste. Portable toilets shall be positioned so they are secure and will not be tipped or knocked over and so they are located away from waters of the state and stormwater inlets and stormwater conveyances.

(d) Ensure the storage of construction materials be kept away from drainage courses, stormwater conveyances, storm drain inlets, and low areas.

(3) Fueling Facilities:

All fueling facilities present shall, at all times adhere to applicable federal and state regulations concerning underground storage, above ground storage, and dispensers.

(4) Equipment and Vehicle Washing:

No detergents, additives, or soaps of any kind shall be discharged. Rinse waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge.

(5) Hazardous Wastes:

Any hazardous wastes that are generated onsite shall be managed, stored, and transported according to the provisions of the Missouri Hazardous Waste Laws and Regulations.

(6) Material and Chemical Storage:

(a) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on the site to precipitation and to stormwater;

(b) Store all paints, solvents, petroleum products, petroleum waste products, and storage containers (such as drums, cans, or cartons) so they are not exposed to stormwater or provide other prescribed BMPs (such as plastic lids and/or portable spill pans) to prevent the commingling of stormwater with container contents. Commingled water may not be discharged.

(c) Provide spill prevention, control, and countermeasures to contain the spill. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall prevent the contamination of groundwater.

(7) Leak and Spill Prevention:

Implement measures intended to prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicles and equipment to thereby prevent the contamination of stormwater from these substances. This may include prevention measures such as, but not limited to, utilizing drip pans under vehicles and equipment stored outdoors, covering fueling areas, using dry clean-up methods, use of absorbents, and cleaning pavement surfaces to remove oil and grease.

(8) Spills, Overflows, and Other Unauthorized Discharges:

(a) Any spill, overflow, or other discharge not specifically authorized in the permit are unauthorized.
(b) Spills must be cleaned up as soon as possible to prevent entrainment in stormwater.
(c) Should a spill or an unauthorized discharge cause or permit any contaminants, other than sediment, or hazardous substance to discharge or enter waters of the state, the unauthorized discharge must be reported to the Missouri Department of Natural Resources regional office as soon as practicable but no more than 24 hours after the discovery of the discharge. If the spill or overflow needs to be reported after normal business hours or on the weekend, the facility must call the Department's Environmental Emergency Response hotline at (573) 634-2436. Leaving a message on a Department staff member voice-mail does not satisfy this reporting requirement.
(d) A record of all spills shall be retained with the SWPPP and made available to the Missouri Department of Natural Resources upon request.

3. Structural BMP Installation and Maintenance

All BMPs shall be properly installed and operational at the locations and relative times specified in the SWPPP. Installation of BMPs necessary to prevent soil erosion and sedimentation at the downgradient project boundary (e.g. buffers, perimeter controls, exit point controls, storm drain inlet protection) must be complete prior to the start of all phases of construction. By the time construction activity in any given portion of the site begins, downgradient BMPs must be installed and operational to control discharges from the initial site clearing, grading, excavating, and other earth-disturbing activities. Additional BMPs shall be installed as necessary throughout the life of the project.

All BMPs shall be maintained and remain in effective operating condition during the entire duration of the project, with repairs made within the timeframes specified elsewhere in this permit, until final stabilization has been achieved. BMPs must be protected from activities that would reduce their effectiveness. Any sediment must be removed per the BMP manufacturer's instructions or before it has accumulated to one-half of the above-ground height of any BMP that collects sediment (i.e., silt fences, sediment traps, etc.). The project is considered to achieve final stabilization when Condition 5 listed below is met.

(1) Perimeter Control BMPs:

(a) Perimeter control BMPs for runoff from disturbed areas shall be installed before general site clearing is started. Note this requirement does not apply to earth disturbances related to initial site clearing and establishing entry, exit, or access of the site, which may require that stormwater controls be installed immediately after the earth disturbance.
(b) For phased projects, BMPs shall be properly installed as necessary prior to construction activities.
(c) Install sediment controls along any perimeter areas of the site that are downgradient from any exposed soil or other disturbed areas. Prevent stormwater from circumventing the edge of the perimeter control. For sites where perimeter controls are infeasible, other practices shall be implemented to minimize discharges to perimeter areas of the site.
(d) Stormwater discharges which leave the site from disturbed areas shall pass through an appropriate impediment to sediment movement such as a sedimentation basin, sediment traps (including vegetative buffers), or silt fences prior to leaving the land disturbance site.

(2) Stockpiles or Land Clearing Debris Piles of Sediment or Soil:

(a) Install a sediment barrier along all downgradient perimeter areas;
(b) Divert surface flows around stockpiles to reduce and minimize erosion of the stockpile.
(c) For piles that will be unused for 14 or more days, provide cover with appropriate temporary stabilization.
(d) It is prohibited to rinse, sweep, or otherwise place any soil, sediment, debris, or stockpiled product which has accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or Water of the State.

(3) Sedimentation Basins:

A sedimentation basin shall be used for each drainage area with ten or more acres disturbed at one time.

(a) Sediment basins shall not be constructed in any Waters of the State or natural buffer zones.

(b) Both temporary and permanent sedimentation basins shall have a stabilized spillway to minimize the potential for erosion of the spillway or basin embankment.

(c) The basin shall be maintained until final stabilization of the disturbed area served by the basin.

(d) Accumulated sediment shall not exceed 50% of total volume or as prescribed in the design, whichever is less.

(e) Dewatering:

1) Discharges from dewatering activities shall be managed by appropriate controls as specified in the SWPPP. Appropriate controls may include, but are not limited to, sediment socks, dewatering tanks, tube settlers, weir tanks, filtration systems (e.g. bag or sand filters), and passive treatment systems that are designed to remove or retain sediment.

2) Erosion controls and velocity dissipation devices (e.g., check dams, riprap, and vegetated buffers) to minimize erosion at inlets, outlets, and discharge points from shall be utilized.

3) Water with an oil sheen, or visible floating solids and foam shall not be discharged.

4) Prevent discharges to the receiving stream causing excessive visual turbidity. Visual turbidity refers to a sediment plume or other cloudiness in the water caused by sediment that can be identified by an observer.

5) Until final stabilization has been achieved, sediment basins and impoundments shall utilize outlet structures or floating skimmers that withdraw water from the surface when discharging. Under frozen conditions, it may be considered infeasible to withdraw water from the surface and an exception can be made for that specific period as long as discharges that may contain sediment and other pollutants are managed by appropriate controls. If determined infeasible due to frozen conditions, documentation must be provided in the SWPPP to support the determination, including the specific conditions or time period when this exception applies.

(4) Sediment Trackout and Sediment Transport:

Minimize sediment trackout from the site and sediment transport onto roadways.

(a) Restrict vehicle traffic to designated exit points.

(b) Use appropriate stabilization techniques or BMPs at all points that exit onto paved roads or areas outside of the site.

(c) Use additional controls or BMPs to remove sediment from vehicle and equipment tires prior to exit from facility where necessary.

(d) Any sediment or debris that is tracked out past the exit pad or is deposited on a roadway after a precipitation event shall be removed by the shorter of either the same business day (for business days only), or by the end of the next business day if track-out occurs on a non-business day, and before predicted rain events. Remove the track-out sediment by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. Sediment or debris tracked out on pavement or other impervious surfaces shall not be disposed of into any stormwater conveyance, storm drain inlet, or Waters of the State.

(e) Stormwater inlets susceptible to receiving sediment or other pollutants from the permitted land disturbance site shall have curb inlet protection. This may include inlets off the active area where track out from vehicles and equipment could impact the stormwater runoff to those inlets.

(5) Concrete Washout Facilities:

Concrete washout facilities shall be used to contain concrete waste from the activities onsite, unless the washout of trucks and equipment is managed properly at an off-site location. The washout facility shall be managed to prevent solid and/or liquid waste from entering Waters of the State by the following:

(a) Direct the wash water into leak-proof containers or pits designed so that no overflows can occur due to inadequate sizing or precipitation;

(b) Locate washout activities away from Waters of the State, stormwater inlets, and/or stormwater conveyances where practicable. If not practicable, use BMPs to reduce risk of waste leaving the washout facility;

(c) Washout facilities shall be cleaned, or new facilities must be constructed and ready for use, once the washout is 75% full;

(d) Designate the washout area(s) and conduct such activities only in these areas.

(e) Ensure contractors are aware of the location, such as by marking the area(s) on the map or signage visible to the truck and/or equipment operators.

(6) Immediate Stabilization After Soil Disturbing Activities:

Soil disturbing activities on site that have ceased either temporarily or permanently shall initiate stabilization immediately in accordance with the options below.

(a) For soil disturbing activities that have been temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days:
   1) BMPs shall be constructed to establish interim stabilization;
   2) Interim stabilization must be initiated immediately and completed within 14 calendar days.

(b) For soil disturbing activities that have been permanently ceased on any portion of the site:
   1) Final stabilization of disturbed areas shall be implemented;
   2) Final stabilization must be initiated immediately and completed within 14 calendar days.

(c) If the slope of the area is greater than 3:1 (three feet horizontal to one foot vertical), then interim stabilization shall be established within seven calendar days of ceasing operations on that part of the site.

(d) Allowances to the 14-day completion period for temporary and final stabilization may be made due to weather and equipment malfunctions. The use of allowances shall be documented in the SWPPP. Allowances may be determined unnecessary after review by the Department.

(e) The following activities would constitute the immediate initiation of stabilization:
   1) Prepping the soil for vegetative or non-vegetative stabilization as long as seeding, planting, and/or installation of non-vegetative stabilization products takes place as soon as practicable;
   2) Applying mulch or other non-vegetative product to the exposed areas;
   3) Seeding or planting the exposed areas;
   4) Finalizing arrangements to have stabilization product fully installed in compliance with the deadlines for completing stabilization.

(f) Until stabilization is complete, interim sediment control shall consist of well-established and maintained BMPs that are reasonably certain to protect waters of the state from sediment pollution over an extended period of time. This may require adding more BMPs to an area than is normally used during daily operations. The types of BMPs used must be suited to the area disturbed, taking into account the number of acres exposed and the steepness of the slopes.

(g) If vegetative stabilization measures are being implemented, stabilization is considered "installed" when all activities necessary to seed or plant the area are completed. Installed does not mean established.

(h) If non-vegetative stabilization measures are being implemented, stabilization is considered "installed" when all such measures are implemented or applied. Non-vegetative stabilization shall prevent erosion and shall be chosen for site conditions, such as slope and flow of stormwater.

(i) Final stabilization is not considered achieved until vegetation has grown and established to meet the requirements below.

(7) Final Stabilization:

Prior to removal of BMPs, ceasing site inspections, and removing from the quarterly report, final stabilization must be achieved. Final stabilization shall be achieved as soon as possible once land disturbance activities have ceased. Document in the SWPPP the type of stabilization and the date final stabilization is achieved.

(a) The project is considered to have achieved final stabilization when perennial vegetation (excluding volunteer vegetation), pavement, buildings, or structures using permanent materials (e.g., riprap, gravel, etc.) cover all areas that have been disturbed. With respect to areas that have been vegetated, vegetation must be at least **70%** coverage of 100% of the vegetated areas on site. Vegetation must be evenly distributed.

(b) Disturbed areas on agricultural land are considered to have achieved final stabilization when they are restored to their preconstruction agricultural use. If former agricultural land is changing to non-agricultural use, this is no longer considered agricultural land and shall follow condition (a).

(c) If the intended function of a specific area of the site necessitates that it remains disturbed, final stabilization is considered achieved if all of the following are met:
   1) Only the minimum area needed remains disturbed (i.e., dirt access roads, motocross tracks, utility pole pads, areas being used for storage of vehicles, equipment, materials). Other areas must meet the criteria above.
   2) Permanent structural BMPs (e.g., rock checks, berms, grading, etc.) or non-vegetative stabilization measures are implemented and designed to prevent sediment and other pollutants from entering waters of the state.
   3) Inspection requirements in Part IV. SWPPP MANAGEMENT REQUIREMENT, Condition 11 are met and documented in the SWPPP.
   4) Winter weather and frozen conditions do not excuse any of the above final stabilization requirements. If vegetation is required for stabilization the permittee must maintain BMPs throughout winter weather and frozen conditions until thawing and vegetation meets final stabilization criteria above. Document stabilization attempts during frozen conditions in the SWPPP. Consider future freezing when removing vegetation and plan with temporary stabilization techniques before the ground becomes frozen.

PART VI: SITE INSPECTION REPORT
(To be Maintained by GENERAL CONTRACTOR)

Refer to page 4 in Part III. Project Planning & Design, specify the **2-year, 24-hour storm event** for the project location:

_____ inch.

Specify the notification method when stormwater runoff occurs: _____

1. Site Inspector:

Regularly scheduled inspections shall be conducted by a qualified person (an inspector). An inspector can be the environmental lead or a person trained by and directly supervised by the environmental lead. The inspector shall be knowledgeable in erosion, sediment, and stormwater control principles, and shall have knowledge of the permit, and the site's SWPPP.

2. Scope of Inspection:

Refer to **Appendix E** for the site inspection report. Site inspections shall include, at a minimum, the following:

(1) Inspect all structures that function to prevent or minimize pollution of Waters of the State.
(2) For disturbed areas that have not achieved final stabilization, all installed BMPs and other pollution control measures shall be inspected to ensure they are properly installed, appear to be operational, and are working as intended to minimize the discharge of pollutants.
(3) For areas on site that have achieved either temporary or final stabilization, while at the same time active construction continues on other areas, ensure that all stabilization measures are properly installed, appear to be operational, and are working as intended to minimize the discharge of pollutants.
(4) Inspect all material, waste, borrow, and equipment storage and maintenance areas that are covered by this permit. Inspect for conditions that could lead to spills, leaks, or other accumulations of pollutants on the site.
(5) Inspect all areas where stormwater typically flows within the site, including drainage ways designed to divert, convey, and/or treat stormwater.
(6) All stormwater outfalls shall be inspected for evidence of erosion, sediment deposition, or impacts to the receiving stream. If a discharge is occurring during an inspection, the inspector must observe and document the visual quality of the discharge and take note of the characteristics of the stormwater discharge, including turbidity, color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indicators of stormwater pollutants.
(7) When practicable the receiving stream shall also be inspected for a minimum of 50 feet downstream of the outfall.
(8) The perimeter of the site shall be inspected for evidence of BMP failure to ensure concentrated flow does not develop a new outfall.

3. Inspection Frequency:

All BMPs must be inspected in accordance to one of the schedules listed below. The inspection frequency shall be documented in the table below, and any changes to the frequency of inspections, including switching between the options listed below, must be documented on the inspection report:

(1) **7-day option:** at least once every seven (7) calendar days and within 48 hours after any storm event equal to or greater than a 2-year, 24-hour storm has ceased during a normal workday or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday; or
(2) **14-day option:** once every 14 calendar days and within 24 hours of the occurrence of a storm event of 0.25 inches of precipitation or greater, or the occurrence of runoff from snowmelt. To determine if a storm event of 0.25 inches or greater has occurred on the site, the permittee shall either keep a properly maintained rain gauge on site, or obtain the storm event information from a weather station near the site location.
   (a) Inspections are only required during the project's normal working hours.
   (b) An inspection must be conducted within 24 hours of a storm event which has produced 0.25 inches. The inspection shall be conducted within 24 hours of the event end, or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday.
   (c) If it is elected to inspect every 14 calendar days and there is a storm event at the site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, the permittee shall conduct an inspection

within 24 hours of the end of the storm or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday.

Specify the inspection frequency based on the above (1) 7-Day option, or (2) 14-day option. Any changes to the frequency of inspections, including switching between the options, must be documented both here and on the inspection report:

Option	Date Implemented

(3) Areas on site that have achieved stabilization, while at the same time active construction continues on other areas, may reduce inspection frequency to monthly, for those stabilized areas, if the following conditions exist:
   (a) For areas where disturbed portions have undergone temporary stabilization, inspections shall occur at least once a month while stabilized and when re-disturbed shall follow either frequency outlined in (1) or (2) above.
   (b) Areas on site that have achieved final stabilization must be inspected at least once per month until the permit is terminated.

(4) If construction activities are suspended due to frozen conditions, the permittee may temporarily reduce site inspections to monthly until thawing conditions begin to occur if all of the following are met:
   (a) Land disturbances have been suspended; and
   (b) All disturbed areas of the site have been stabilized per BMP requirements.
   (c) The change shall be noted in the table above.

(5) Any basin dewatering shall be inspected daily when discharge is occurring. The discharge shall be observed, and dewatering activities shall be ceased immediately if the receiving stream is being impacted. These inspections shall be noted on a log or on the inspection report.

4. Site Inspection Reports:

A log of each inspection and/or copy of the inspection report shall be kept readily accessible and must be made available upon request by the Department. Electronic logs are acceptable as long as reports can be provided within 24 hours. If inspection reports are kept off site, the SWPPP must indicate where they are stored. The inspection report shall be signed by the environmental lead or designated inspector (electronically or otherwise).

(1) The inspection report is to include the following minimum information:
   (a) Inspector's name and title.
   (b) Date and time of inspection.
   (c) Observations relative to the effectiveness of the BMPs and stabilization measures. The following must be documented:
      1) Whether BMPs are installed, operational, and working as intended;
      2) Whether any new or modified stormwater controls are needed;
      3) Facilities examined for conditions that could lead to spill or leak;

4) Outfalls examined for visual signs of erosion or sedimentation at outfalls. Excessive erosion or sedimentation may be due to BMP failure or insufficiency. Response to observations should be addressed in the inspection report.

(d) Corrective actions taken or necessary to correct the observed problem.

(e) Listing of areas where land disturbance operations have permanently or temporarily stopped.

5. Inspection Follow-up

Any structural or maintenance deficiencies for BMPs or stabilization measures shall be documented and corrected as soon as possible, but no more than seven (7) calendar days after the inspection.

(1) Corrective action documentation shall be stored with the associated site inspection report.

(2) Immediately take all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events.

(3) If weather conditions or other issues prevent correction of BMPs within seven calendar days, the reasons for the delay must be documented (this may include pictures) and there must be a narrative explaining why the work cannot be accomplished within the seven-day time period. The problem shall be corrected as soon as weather conditions or issues allow.

(4) Corrective actions may be required by the Missouri Department of Natural Resources. The site operator must comply with any corrective actions required by the Department as a result of permit violations found during an inspection.

Appendix A – SWPPP Update and Modification Log

SWPPP UPDATE & MODIFICATION LOG

(To be completed, when necessary, during design modification or construction)

Create a log here of the changes and updates to the SWPPP. You should include additions of new BMPs, significant changes in the activities or their timing on the project, changes in personnel, changes in inspection and maintenance procedures, and updates to the SITE MAP, etc.

Summary of Content Updates	Date

Appendix B – Public Notification Sign

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

STORMWATER DISCHARGES FROM THIS LAND DISTURBANCE SITE ARE AUTHORIZED BY THE MISSOURI STATE OPERATING PERMIT NUMBER:

_____

ANYONE WITH QUESTIONS OR CONCERNS ABOUT STORMWATER DISCHARGES FROM THIS SITE, PLEASE CONTACT THE MISSOURI DEPARTMENT OF NATURAL RESOURCES AT

1-800-361-4827

Appendix C – General Location Map

Attach the General Location Map

Appendix D – Site Map(s)

SITE MAP REQUIREMENTS:

The first should show the undeveloped site and its current features. An additional map or maps should be created to show the developed site. These maps should include the following:

- ☐ Site boundaries of the property;
- ☐ Locations of all Waters of the State (including wetlands) within the site and half a mile downstream of the site's outfalls;
- ☐ Location of all outfalls;
- ☐ Location of stormwater inlets and conveyances including ditches, pipes, man-made conduits, and swales;
- ☐ Areas of soil disturbance and areas that will not be disturbed (or a statement that all areas of the site will be disturbed unless otherwise noted);
- ☐ Locations of on-site and off-site material, waste, borrow, concrete washout facility, disposal of the material removed from sediment basins, equipment storage areas and stockpiles;
- ☐ Designated points where vehicles will exit the site;
- ☐ Location of structural and non-structural BMPs, including natural buffer areas, identified in the SWPPP;
- ☐ Direction(s) of stormwater flow (use arrows) and approximate slopes before and after grading activities;
- ☐ Location and timing of stabilization measures;
- ☐ Areas where final stabilization has been achieved;
- ☐ Change of a drainage course; and
- ☐ The sloped areas for all phases of the project.

Attach SITE MAPs.

Appendix E – Site Inspection Reports

Instructions

Using the Inspection Report

This inspection report is designed to be customized according to the BMP's and conditions at your site. For ease of use, you should take a copy of your site plan and number all of the stormwater BMPs and areas of your site that will be inspected. A brief description of the BMP or area should then be listed in the site-specific section of the inspection report. For example, specific structural BMPs such as construction site entrances, sediment ponds, or specific areas with silt fence (e.g., silt fence along Main Street; silt fence along slope in NW corner, etc.) should be numbered and listed. You should also number specific non-structural BMPs or areas that will be inspected (such as trash areas, material storage areas, temporary sanitary waste areas, etc.).

You can complete the items in the "General Information" section that will remain constant, such as the project name, NPDES tracking number, and inspector (if you only use one inspector). Print out multiple copies of this customized inspection report to use during your inspections.

When conducting the inspection, walk the site by following your SITE MAP and numbered BMPs/areas for inspection.

Also note whether the overall site issues have been addressed (customize this list according to the conditions at your site). Note any required corrective actions, the date, and responsible person for the correction in the Corrective Action Log.

Stormwater Construction Site Inspection Report

General Information			
Project Name:			
NPDES Tracking No.:		**Location:**	
Date of Inspection:		**Start/End Time:**	
Inspector's Name(s):			
Inspector's Title(s):			
Inspector's Contact:			
Inspector's Qualifications:			
Describe present phase of construction:			
Type of Inspection: ☐ Regular - ☐ 7-day, ☐ 14-day ☐ Pre-storm Event ☐ During Storm Event ☐ Post-storm Event			
Weather Information			
Has there been a storm event since the last inspections? ☐ **Yes** ☐ **No**			
If yes, provide: Storm Start Date & Time Storm Duration (hrs) Approximate Amount of Precipitation (in.)			
Weather at time of this Inspection? ☐ Clear ☐ Cloudy ☐ Rain ☐ Sleet ☐ Fog ☐ Snowing ☐ High Winds ☐ Other: Temperature:			
Have any discharges occurred since the last inspection?	☐ Yes ☐ No		
If yes, describe:			
Are there any discharges at the time of inspection?	☐ Yes ☐ No		
If yes, describe the visual quality of the discharge including turbidity; color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indictors of stormwater pollutants:			

Site-specific BMPs

- Number the structural and non-structural BMPs identified in your SWPPP on your SITE MAP and list them below (add as many BMPs as necessary). Carry a copy of the numbered SITE MAP with you during your inspections. This list will ensure that you are inspecting all required BMPs at your site.
- Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.

	BMP	BMP Installed Properly?	BMP Maintenance Required?	Corrective Action Needed and Notes
1		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
2		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
3		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
4		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
5		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
6		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
7		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	

8		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
9		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
10		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
11		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
12		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
13		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
14		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
15		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
16		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
17		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
18		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
19		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
20		☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	

Overall Site Issues

Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

	BMP/activity	**Implemented?**	**Maintenance Required?**	**Corrective Action Needed and Timeline Requirements**
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
2	Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
3	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
4	Are discharge points free of sediment deposition, erosion, or impacts on the receiving stream?	☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
5	If practicable, is the receiving stream (including 50 ft or more downstream) free from the impact of the discharge points?	☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
5	Are storm drain inlets properly protected?	☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
6	Is the construction exit equipped to prevent sediment from being tracked out?	☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	

7	Is trash, litter or other type of waste on site properly handled?	☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
8	Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
9	Are vehicle and equipment fueling, cleaning, storage and maintenance areas free of spills, leaks, or any other deleterious material?	☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
10	Are materials that are potential stormwater contaminants stored inside or under cover?	☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
11	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	
12	(Other)	☐ **Yes** ☐ **No**	☐ **Yes** ☐ **No**	

Non-Compliance

CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Print name and title: _____

Signature: _____ Date: _____

Appendix F – City's Construction General Permit & Additional Information

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No. MO-R100000

Owner:
Address:

Continuing Authority:
Address:

Facility Name:
Facility Address:

Legal Description:
UTM Coordinates:

Receiving Stream:
First Classified Stream and ID:
USGS Basin & Sub-watershed No.:

is authorized to discharge from the facility described herein, in accordance with the effluent limitations, inspection, reporting, and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

All Outfalls
Construction or land disturbance activity (e.g., clearing, grubbing, excavating, grading, filling, and other activities that result in the destruction of the root zone and/or land disturbance activity that is reasonably certain to cause pollution to waters of the state).

This permit authorizes stormwater and certain non-stormwater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

July 5, 2022
Effective Date

June 30, 2027
Expiration Date

Chris Wieberg, Director, Water Protection Program

I. APPLICABILITY

A. Permit Coverage and Authorized Discharges

1. This Missouri State Operating Permit (permit) authorizes the discharge of stormwater and certain non-stormwater discharges from land disturbance sites that disturb one or more acres, or disturb less than one acre when part of a larger common plan of development or sale that will disturb a cumulative total of one or more acres over the life of the project.

   A Missouri State Operating Permit must be issued before any site vegetation is removed or the site disturbed. Any site owner/operator subject to these requirements for stormwater discharges and who disturbs land prior to permit issuance from the Missouri Department of Natural Resources (Department) is in violation of both State regulations per 10 CSR 20-6.200(1)(A) and Federal regulations per 40 CFR 122.26. The owner/operator of this permit is responsible for compliance with this permit [10 CSR 20-6.200 (3)(B)].

2. This general permit is issued to a city, county, state or federal agency, other governmental jurisdiction, or other private area-wide projects as determined by the Department on a case-by-case basis, for land disturbance projects performed by or under contract to the permittee.

3. This permit authorizes stormwater discharges from land disturbance support activities (e.g., equipment staging yards, material storage areas, excavated material disposal areas, borrow areas, concrete, or asphalt batch plants) provided appropriate stormwater controls are designed, installed, and maintained and the following conditions are met and addressed in the Stormwater Pollution Prevention Plan (SWPPP). The permittee is responsible for compliance with this permit for any stormwater discharges from construction support activity.
   (a) The support activity is directly related to the construction site required to have permit coverage for stormwater discharges;
   (b) The support activity is not a commercial operation or serve multiple unrelated construction sites;
   (c) The support activity does not continue to operate beyond the completion of the construction activity at the project it supports;
   (d) Sediment and erosion controls are implemented in accordance with the conditions of this permit; and
   (e) The support activity is strictly stormwater discharges or non-stormwater discharges listed in PART I, APPLICABILTY, Condition A.4. Support activities which discharge process water shall apply for separate coverage (e.g.,a concrete batch plant discharging process water shall be covered under a MOG49).

4. This permit authorizes non-stormwater discharges associated with your construction activity from the following activities provided that these discharges are treated by appropriate Best Management Practices (BMPs) where applicable and addressed in the permittee's site specific SWPPP required by this general permit:
   (a) Discharges from emergency fire-fighting activities;
   (b) Hydrant flushing and water line flushing, provided the discharged water is managed to avoid instream water quality impacts;
   (c) Landscape watering, including to establish vegetation;
   (d) Water used to control dust;
   (e) Waters used to rinse vehicles and equipment, provided there is no discharge of soaps, solvents, or detergents used for such purposes;
   (f) External building washdown, provided soaps, solvents, and detergents are not used, and external surfaces do not contain hazardous substances (e.g., paint or caulk containing polychlorinated biphenyls (PCBs))
   (g) Pavement wash waters, provided spills or leaks of toxic or hazardous substances have not occurred (unless all spill material has been removed) and where soaps, solvents, and detergents are not used. Directing pavement wash waters directly into any water of the state, storm drain inlet, or stormwater conveyance (constructed or natural site drainage features), unless the conveyance is connected to an effective control, is prohibited;
   (h) Uncontaminated air conditioning or compressor condensate;
   (i) Uncontaminated, non-turbid discharges of ground water or spring water;
   (j) Foundation or footing drains where flows are not contaminated with process materials; and
   (k) Uncontaminated construction dewatering water discharged in accordance with requirements found in this permit for specific dewatering activities.

B. Permit Restrictions and Limitations

1. This permit does not authorize the discharge of process wastewaters, treated or otherwise.

2. For sites operating within the watershed of any Outstanding National Resource Water (which includes the Ozark National Riverways and the National Wild and Scenic Rivers System), sites that discharge to an Outstanding State Resource Water, or facilities located within the watershed of an impaired water as designated in the Clean Water Act (CWA) Section 303(d) list with an impairment for sedimentation/siltation:
   (a) This permit authorizes stormwater discharge provided no degradation of water quality occurs due to discharges from the permitted facility per 10 CSR 20-7.031(3)(C).
   (b) A site with a discharge found to be causing degradation or contributing to an impairment by discharging a pollutant of concern, during an inspection or through complaint investigations, may be required to become a no discharge facility or obtain a site-specific permit with more stringent monitoring and SWPPP requirements.

3. This permit does not allow placement of fill material into any stream or wetland, alteration of a stream channel, or obstruction of stream flow unless the appropriate CWA Section 404 permitting authority provides approval for such actions or determines such actions are exempt from Section 404 jurisdiction. Additionally, this permit does not authorize placement of fill in floodplains unless approved or determined exempt by appropriate federal and/or state floodplain development authorities.

4. This operating permit does not affect, remove, or replace any requirement of the National Environmental Policy Act; the Endangered Species Act; the National Historic Preservation Act; the Comprehensive Environmental Response, Compensation and Liability Act; the Resource Conservation and Recovery Act; or any other relevant acts. Determination of applicability to the above mentioned acts is the responsibility of the permittee. Additionally, this permit does not establish terms and conditions for runoff resulting from silvicultural activities listed in Section 402(l)(3)(a) of the Clean Water Act.

5. Compliance with all requirements in this permit does not supersede any requirement for obtaining project approval from an established local authority nor remove liability for compliance with county and other local ordinances.

6. The Department may require any facility or site authorized by a general permit to apply for a site-specific permit [10 CSR 20-6.010(13)(C)].

7. If a facility or site covered under a current general permit desires to apply for a site-specific permit, the facility or site may do so by contacting the Department for application requirements and procedures.

8. Any discharges not expressly authorized in this permit and not clearly disclosed in the permit application cannot become authorized or shielded from liability under CWA section 402(k) or Section 644.051.16, RSMo, by disclosure to EPA, state, or local authorities after issuance of this permit via any means, including any other permit applications, funding applications, the SWPPP, discharge monitoring reporting, or during an inspection. Discharges at the facility not expressly authorized by this permit must be covered by another permit, be exempt from permitting, or be authorized through some other method.

II. EXEMPTIONS FROM PERMIT REQUIREMENTS

1. Sites that discharge all stormwater runoff directly to a combined sewer system (as defined in 40 CFR 122.26 and 40 CFR 35.2005) connecting to a publicly owned treatment works which has consented to receive such a discharge are exempt from Department stormwater permit requirements.

2. Land disturbance activities that disturb less than one (1) acre of total land area which are not part of a common plan or sale where water quality standards are not exceeded are exempt from Department stormwater permit requirements.

3. Oil and gas related activities as listed in 40 CFR 122.26(a)(2)(ii) where water quality standards are not exceeded are exempt from Department stormwater permit requirements.

4. Linear, strip, or ribbon construction or maintenance operations meeting one (1) of the following criteria are exempt from Department stormwater permit requirements:
   (a) Grading of existing dirt or gravel roads which does not increase the runoff coefficient and the addition of an impermeable surface over an existing dirt or gravel road;
   (b) Cleaning or routine maintenance of roadside ditches, sewers, waterlines, pipelines, utility lines, or similar facilities;
   (c) Trenches two (2) feet in width or less; or
   (d) Emergency repair or replacement of existing facilities as long as BMPs are employed during the emergency repair.

III. REQUIREMENTS

1. The permittee shall post a public notification sign at the main entrance to the site, or a publically visible location, with the specific MOR100 permit number. The public notification sign must be visible from the public road that provides access to the site's main entrance. An alternate location is acceptable provided the public can see it and it is noted in the SWPPP. The public notification sign must remain posted at the site until the site is finalized.

2. The permittee shall be responsible for notifying the land owner and each contractor or entity (including utility crews and city employees or their agents) who will perform work at the site of the existence of the SWPPP and what actions or precautions shall be taken while on site to minimize the potential for erosion and the potential for damaging any BMP. The permittee is responsible for any damage a subcontractor may do to established BMPs and any subsequent water quality violation resulting from the damage.

3. Ensure the design, installation, and maintenance of effective erosion and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed, and maintained to:
   (a) Control stormwater volume, velocity, and peak flow rates to minimize soil erosion;
   (b) Control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion and scour;
   (c) Minimize the amount of exposed soil during construction activity;
   (d) Minimize the disturbance of steep slopes;
   (e) Minimize sediment discharges from the site. Address factors such as:
      1) The amount, frequency, intensity, and duration of precipitation;
      2) The nature of resulting stormwater runoff;
      3) Expected flow from impervious surfaces, slopes, and drainage features; and
      4) Soil characteristics, including the range of soil particle size expected to be present on the site.
   (f) Provide and maintain natural buffers around surface waters as detailed in Part V. BMP REQUIREMENTS Condition 7, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration and filtering, unless infeasible; and
   (g) Minimize soil compaction and preserve topsoil where practicable.

   A 2-year, 24-hour storm event can be determined for the project location using the National Oceanic and Atmospheric Administration's National Weather Service Atlas 14 which can be located at https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html, or the permittee can determine local rainfall distribution for a 2-year, 24 hours storm event using multi-decade local high density rain gauge data, as approved by the Department.

4. BMPs for land disturbance [10 CSR 20-6.200(1)(D)2] are a schedule of activities, practices, or procedures that reduces the amount of soil available for transport or a device that reduces the amount of suspended solids in runoff before discharge to waters of the state. The term BMPs are also used to describe the sediment and erosion controls and other activities used to prevent stormwater pollution. BMPs are divided into two main categories: structural or non-structural; and they are also classified as temporary or permanent.
   Temporary BMPs may be added and removed as necessary with updates to the SWPPP as specified in the requirements below.

5. Installation of BMPs necessary to prevent soil erosion and sedimentation at the downgradient project boundary (e.g. buffers, perimeter controls, exit point controls, storm drain inlet protection) must be complete prior to the start of all phases of construction. By the time construction activity in any given portion of the site begins, downgradient BMPs must be installed and operational to control discharges from the initial site clearing, grading, excavating, and other earth-disturbing activities. Additional BMPs shall be installed as necessary throughout the life of the project.

6. All BMPs shall be maintained and remain in effective operating condition during the entire duration of the project, with repairs made within the timeframes specified elsewhere in this permit, until final stabilization has been achieved.
   (a) Ensure BMPs are protected from activities that would reduce their effectiveness.
   (b) Remove any sediment per the BMP manufacturer's instructions or before it has accumulated to one-half of the above-ground height of any BMP that collects sediment (i.e., silt fences, sediment traps, etc.)
   (c) The project is considered to achieve final stabilization when Part V. BMP REQUIREMENTS, Condition 13 is met.

7. Minimize sediment trackout from the site and sediment transport onto roadways.
   (a) Restrict vehicle traffic to designated exit points.
   (b) Use appropriate stabilization techniques or BMPs at all points that exit onto paved roads or areas outside of the site.
   (c) Use additional controls or BMPs to remove sediment from vehicle and equipment tires prior to exit from facility where necessary.
   (d) Any sediment or debris that is tracked out past the exit pad or is deposited on a roadway after a precipitation event shall be removed by the shorter of either the same business day (for business days only), or by the end of the next business day if track-out occurs on a non-business day, and before predicted rain events. Remove the track-out sediment by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. Sediment or debris tracked out on pavement or other impervious surfaces shall not be disposed of into any stormwater conveyance, storm drain inlet, or water of the state.
   (e) Stormwater inlets susceptible to receiving sediment or other pollutants from the permitted land disturbance site shall have curb inlet protection. This may include inlets off the active area where track out from vehicles and equipment could impact the stormwater runoff to those inlets.

8. Concrete washout facilities shall be used to contain concrete waste from the activities onsite, unless the washout of trucks and equipment is managed properly at an off-site location.
   The washout facility shall be managed to prevent solid and/or liquid waste from entering waters of the state by the following:
   (a) Direct the wash water into leak-proof containers or pits designed so that no overflows can occur due to inadequate sizing or precipitation;
   (b) Locate washout activities away from waters of the state, stormwater inlets, and/or stormwater conveyances where practicable. If not practicable, use BMPs to reduce risk of waste leaving the washout facility;
   (c) Washout facilities shall be cleaned, or new facilities must be constructed and ready for use, once the washout is 75% full;
   (d) Designate the washout area(s) and conduct such activities only in these areas.
   (e) Ensure contractors are aware of the location, such as by marking the area(s) on the map or signage visible to the truck and/or equipment operators.

9. Good housekeeping practices shall be maintained at all times to keep waste from entering waters of the state.
   (a) Provide solid and hazardous waste management practices, including providing trash containers, regular site cleanup for proper disposal of solid waste such as scrap building material, product/material shipping waste, food/beverage containers, spent structural BMPs;
   (b) Provide containers and methods for proper disposal of waste paints, solvents, and cleaning compounds.
   (c) Manage sanitary waste. Portable toilets shall be positioned so that they are secure and will not be tipped or knocked over and so that they are located away from waters of the state and stormwater inlets and stormwater conveyances.
   (d) Ensure the storage of construction materials be kept away from drainage courses, stormwater conveyances, storm drain inlets, and low areas.

10. All fueling facilities present shall at all times adhere to applicable federal and state regulations concerning underground storage, above ground storage, and dispensers.

11. Any hazardous wastes that are generated onsite shall be managed, stored, and transported according to the provisions of the Missouri Hazardous Waste Laws and Regulations.

12. Store all paints, solvents, petroleum products, petroleum waste products, and storage containers (such as drums, cans, or cartons) so they are not exposed to stormwater or provide other prescribed BMPs (such as plastic lids and/or portable spill pans) to prevent the commingling of stormwater with container contents. Commingled water may not be discharged under this permit. Provide spill prevention, control, and countermeasures to contain the spill. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall prevent the contamination of groundwater.

13. Implement measures intended to prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicles and equipment to thereby prevent the contamination of stormwater from these substances. This may include prevention measures such as, but not limited to, utilizing drip pans under vehicles and equipment stored outdoors, covering fueling areas, using dry clean-up methods, use of absorbents, and cleaning pavement surfaces to remove oil and grease.

14. Spills, Overflows, and Other Unauthorized Discharges.
    (a) Any spill, overflow, or other discharge not specifically authorized in the permit above are unauthorized.
    (b) Should an unauthorized discharge cause or permit any contaminants, other than sediment, or hazardous substance to discharge or enter waters of the state, the unauthorized discharge must be reported to the regional office as soon as practicable but no more than 24 hours after the discovery of the discharge. If the spill or overflow needs to be reported after normal business hours or on the weekend, the facility must call the Department's Environmental Emergency Response hotline at (573) 634-2436. Leaving a message on a Department staff member voice-mail does not satisfy this reporting requirement.
    (c) A record of all spills shall be retained with the SWPPP and made available to the Department upon request.
    (d) Other spills not reaching waters of the state must be cleaned up as soon as possible to prevent entrainment in stormwater but are not required to be reported to the Department.

15. The full implementation of this operating permit shall constitute compliance with all applicable federal and state statutes and regulations in accordance with RSMo 644.051.16 and the CWA §402(k); however, this permit may be reopened and modified or alternatively revoked and reissued to comply with any applicable effluent standard or limitation issued or approved under Clean Water Act §§ 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) if the effluent standard or limitation so issued or approved contains different conditions or is otherwise more stringent than any effluent limitation in the permit or controls any pollutant not limited in the permit. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, termination, notice of planned changes, or anticipated non-compliance does not stay any permit condition.

IV. STORMWATER POLLUTION PREVENTION PLAN (SWPPP) MANAGEMENT REQUIREMENTS

1. The primary requirement of this permit is the development and implementation of a SWPPP which incorporates site specific practices to best minimize the soil exposure, soil erosion, and the discharge of pollutants, including solids for each site covered under this permit.

   The purpose of the SWPPP is to ensure the design, implementation, management, and maintenance of BMPs in order to prevent sediment and other pollutants in stormwater discharges associated with the land disturbance activities [40 CFR 122.44 (k)(4)] from entering waters of the state above established general and narrative criteria; compliance with Missouri Water Quality Standards; and compliance with the terms and conditions of this general permit.

   (a) **The SWPPP must be developed and implemented prior to conducting any land disturbance activities and must be specific to the land disturbance activities at the site.**
   (b) The permittee shall fully implement the provisions of the SWPPP required under this permit as a condition of this general permit throughout the term of the land disturbance project. Failure to develop, implement, and maintain a SWPPP may lead to immediate enforcement action.

(c) The SWPPP shall be updated any time site conditions warrant adjustments to the project or BMPs.
(d) Either an electronic copy or a paper copy of the SWPPP, and any required reports, must be accessible to anyone on site at all times when land disturbance operations are in process or other operational activities that may affect the maintenance or integrity of the BMP structures and made available as specified under Part VIII. STANDARD PERMIT CONDITIONS, Condition 1 of this permit. The SWPPP shall be readily available upon request and should not be sent to the Department unless specifically requested

2. Failure to implement and maintain the BMPs chosen, which can be revised and updated, is a permit violation. The chosen BMPs will be the most reasonable and cost effective while also ensuring the highest quality water discharged attainable for the facility. Facilities with established SWPPPs and BMPs shall evaluate BMPs on a regular basis and change the BMPs as needed if there are BMP deficiencies.

3. The SWPPP must:
   (a) List and describe the location of all outfalls;
   (b) List any allowable non-stormwater discharges occurring on site and where these discharges occur;
   (c) Incorporate required practices identified below;
   (d) Incorporate sediment and erosion control practices specific to site conditions;
   (e) Discuss whether or not a 404 Permit is required for the project; and
   (f) Name the person(s) responsible for inspection, operation, and maintenance of BMPs. The SWPPP shall list the names and describe the role of all owners/primary operators (such as general contractor, project manager) responsible for environmental or sediment and erosion control at the land disturbance site.

4. The SWPPP briefly must describe the nature of the land disturbance activity, including:
   (a) The function of the project (e.g., low density residential, shopping mall, highway, etc.);
   (b) The intended sequence and timing of activities that disturb the soils at the site; and
   (c) Estimates of the total area expected to be disturbed by excavation, grading, or other land disturbance support activities including off-site borrow and fill areas;

5. In order to identify the site, the SWPPP shall include site information including size in acres. The SWPPP shall have sufficient information to be of practical use to contractors and site construction workers to guide the installation and maintenance of BMPs.

6. The function of the SWPPP and the BMPs listed therein is to prevent or minimize pollution to waters of the state. A deficiency of a BMP means it was not effective in preventing or minimizing pollution of waters of the state.

   The permittee shall select, install, use, operate and maintain appropriate BMPs for the permitted site. The following manuals are acceptable resources for the selection of appropriate BMPs.

   Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites, (Document number EPA 833-R-06-004) published by the United States Environmental Protection Agency (USEPA) in May 2007. This manual as well as other information, including examples of construction SWPPPs, is available at the USEPA internet site at https://www.epa.gov/sites/production/files/2015-10/documents/sw_swppp_guide.pdf; and https://www.epa.gov/npdes/developing-stormwater-pollution-prevention-plan-swppp.

   The latest version of *Protecting Water Quality: A field guide to erosion, sediment and stormwater best management practices for development sites in Missouri,* published by the Department. This manual is available at: https://dnr.mo.gov/document-search/protecting-water-quality-field-guide.

   The permittee is not limited to the use of these guidance manuals. Other guidance publications may be used to select appropriate BMPs. However, all BMPs must be described and justified in the SWPPP. Although the use of these manuals or other resources is recommended and may be used for BMP selection, they do not supersede the conditions of this permit. They may be used to inform in the decision making process for BMP selection but they are not themselves part of the permit conditions.

The permittee may retain the SWPPP, inspection reports, and all other associated documents (including a copy of this permit) electronically pursuant to RSMo 432.255. The documents must be made available to all interested persons in either paper or electronic format as required by this permit and the permittee must remit a copy (electronic or otherwise) of the SWPPP and inspection reports to the Department upon request.

7. The SWPPP must contain a legible site map, multiple maps if necessary, identifying:
   (a) Site boundaries of the property;
   (b) Locations of all waters of the state (including wetlands) within the site and half a mile downstream of the site's outfalls;
   (c) Location of all outfalls;
   (d) Direction(s) of stormwater flow (use arrows) and approximate slopes before and after grading activities;
   (e) Areas of soil disturbance and areas that will not be disturbed (or a statement that all areas of the site will be disturbed unless otherwise noted);
   (f) Location of structural and non-structural BMPs, including natural buffer areas, identified in the SWPPP;
   (g) Locations where stabilization practices are expected to occur;
   (h) Locations of on-site and off-site material, waste, borrow, or equipment storage areas and stockpiles;
   (i) Designated points where vehicles will exit the site;
   (j) Location of stormwater inlets and conveyances including ditches, pipes, man-made conduits, and swales; and
   (k) Areas where final stabilization has been achieved.

8. An individual shall be designated by the permittee as the environmental lead. This environmental lead shall have knowledge in erosion, sediment, and stormwater control principles, knowledge of the permit, and the site's SWPPP. The environmental lead shall ensure all personnel and contractors understand any requirements of this permit may be affected by the work they are doing. The environmental lead or designated inspector(s) knowledgeable in erosion, sediment, and stormwater control principles shall inspect all structures that function to prevent or minimize pollution of waters of the state.

9. Throughout coverage under this permit, the permittee shall amend and update the SWPPP as appropriate during the term of the land disturbance activity. All SWPPP modifications shall be signed and dated. The permittee shall amend the SWPPP to incorporate any significant site condition changes which impact the nature and condition of stormwater discharges. At a minimum, these changes include whenever the:
   (a) Location, design, operation, or maintenance of BMPs is changed;
   (b) Design of the construction project is changed that could significantly affect the quality of the stormwater discharges;
   (c) The permittee's inspections indicate deficiencies in the SWPPP or any BMP;
   (d) Department notifies the permittee in writing of deficiencies in the SWPPP;
   (e) SWPPP is determined to be ineffective in minimizing or controlling erosion and sedimentation (e.g., there is visual evidence of excessive site erosion or sediment deposits in streams, lakes, or downstream waterways, sediment or other wastes off site); and/or
   (f) Department determines violations of water quality standards may occur or have occurred.

10. Site Inspections: The environmental lead, or a designated inspector, shall conduct regularly scheduled inspections. These inspections shall be conducted by a qualified person, one who is responsible for environmental matters at the site, or a person trained by and directly supervised by the person responsible for environmental matters at the site. Site inspections shall include, at a minimum, the following:
   (a) For disturbed areas that have not achieved final stabilization, all installed BMPs and other pollution control measures shall be inspected to ensure they are properly installed, appear to be operational, and are working as intended to minimize the discharge of pollutants.
   (b) For areas on site that have achieved either temporary or final stabilization, while at the same time active construction continues on other areas, ensure that all stabilization measures are properly installed, appear to be operational, and are working as intended to minimize the discharge of pollutants.
   (c) Inspect all material, waste, borrow, and equipment storage and maintenance areas that are covered by this permit. Inspect for conditions that could lead to spills, leaks, or other accumulations of pollutants on the site.
   (d) Inspect all areas where stormwater typically flows within the site, including drainage ways designed to divert, convey, and/or treat stormwater.

(e) All stormwater outfalls shall be inspected for evidence of erosion, sediment deposition, or impacts to the receiving stream. If a discharge is occurring during an inspection, the inspector must observe and document the visual quality of the discharge and take note of the characteristics of the stormwater discharge, including turbidity, color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indicators of stormwater pollutants.
(f) When practicable the receiving stream shall also be inspected for a minimum of 50 feet downstream of the outfall.
(g) The perimeter of the site shall be inspected for evidence of BMP failure to ensure concentrated flow does not develop a new outfall.
(h) The SWPPP must explain how the environmental lead will be notified when stormwater runoff occurs.

11. Inspection Frequency: All BMPs must be inspected in accordance to one of the schedules listed below. The inspection frequency shall be documented in the SWPPP, and any changes to the frequency of inspections, including switching between the options listed below, must be documented on the inspection form:
(a) At least once every seven (7) calendar days and within 48 hours after any storm event equal to or greater than a 2-year, 24-hour storm has ceased during a normal work day or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday; or
(b) Once every 14 calendar days and within 24 hours of the occurrence of a storm event of 0.25 inches of precipitation or greater, or the occurrence of runoff from snowmelt. To determine if a storm event of 0.25 inches or greater has occurred on the site, the permittee shall either keep a properly maintained rain gauge on site, or obtain the storm event information from a weather station near the site location.
1) Inspections are only required during the project's normal working hours.
2) An inspection must be conducted within 24 hours of a storm event which has produced 0.25 inches. The inspection shall be conducted within 24 hours of the event end, or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday.
3) If it is elected to inspect every 14 calendar days and there is a storm event at the site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, the permittee shall conduct an inspection within 24 hours of the end of the storm or within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday.
(c) Areas on site that have achieved stabilization, while at the same time active construction continues on other areas, may reduce inspection frequency to monthly, for those stabilized areas, if the following conditions exist:
1) For areas where disturbed portions have undergone temporary stabilization, inspections shall occur at least once a month while stabilized and when re-disturbed shall follow either frequency outlined in (a),(b), or (c) above.
2) Areas on site that have achieved final stabilization must be inspected at least once per month until the permit is terminated.
(d) If construction activities are suspended due to frozen conditions, the permittee may temporarily reduce site inspections to monthly until thawing conditions begin to occur if all of the following are met:
1) Land disturbances have been suspended; and
2) All disturbed areas of the site have been stabilized in accordance with Part V. BMP REQUIREMENTS, Condition 13.
3) The change shall be noted in the SWPPP.
(e) Any basin dewatering shall be inspected daily when discharge is occurring. The discharge shall be observed and dewatering activities shall be ceased immediately if the receiving stream is being impacted. These inspections shall be noted on a log or on the inspection report.

If weather conditions or other issues prevent correction of BMPs within seven calendar days, the reasons for the delay must be documented (including pictures), and there must be a narrative explaining why the work cannot be accomplished within the seven day time period. The documentation must be filed with the regular inspection reports. The corrections shall be made as soon as weather conditions or other issues allow.

12. Site Inspection Reports: A log of each inspection and/or copy of the inspection report shall be kept readily accessible and must be made available upon request by the Department. Electronic logs are acceptable as long as reports can be provided within 24 hours. If inspection reports are kept off site, the SWPPP must indicate where they are stored. The inspection report shall be signed by the environmental lead or designated inspector (electronically or otherwise).
(a) The inspection report is to include the following minimum information:
1) Inspector's name and title.
2) Date and time of inspection.
3) Observations relative to the effectiveness of the BMPs and stabilization measures. The following must be

documented:
a. Whether BMPs are installed, operational, and working as intended;
b. Whether any new or modified stormwater controls are needed;
c. Facilities examined for conditions that could lead to spill or leak;
d. Outfalls examined for visual signs of erosion or sedimentation at outfalls. Excessive erosion or sedimentation may be due to BMP failure or insufficiency. Response to observations should be addressed in the inspection report.

4) Corrective actions taken or necessary to correct the observed problem.
5) Listing of areas where land disturbance operations have permanently or temporarily stopped.

13. Any structural or maintenance deficiencies for BMPs or stabilization measures shall be documented and corrected as soon as possible but no more than seven (7) calendar days after the inspection.
(a) Corrective action documentation shall be stored with the associated site inspection report.
(b) Immediately take all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events.
(c) If weather conditions or other issues prevent correction of BMPs within seven calendar days, the reasons for the delay must be documented (this may include pictures) and there must be a narrative explaining why the work cannot be accomplished within the seven day time period. The permittee shall correct the problem as soon as weather conditions or issues allow.
(d) Corrective actions may be required by the Department. The permittee must comply with any corrective actions required by the Department as a result of permit violations found during an inspection.

V. BMP REQUIREMENTS

1. The information, practices, and BMP requirements in this section shall be implemented on site and, where noted, provided for in the SWPPP.

2. Existing vegetation and trees shall be preserved where practicable. The permittee is encouraged to preserve topsoil where practicable.

3. The permittee shall select appropriate BMPs for use at the site and list them in the SWPPP. When selecting effective BMPs, the permittee shall consider stormwater volume and velocity. A BMP that has demonstrated ineffectiveness in preventing or minimizing sediment or other pollutants from leaving a given site shall be replaced with a more effective BMP, or additional and sequential BMPs and treatment devices may be incorporated as site conditions allow. The permittee should consider a schedule for performing erosion control measures when selecting BMPs.

4. The SWPPP shall include a description of both structural and non-structural BMPs that will be used at the site.
(a) The SWPPP shall provide the following general information for each BMP which will be used one or more times at the site:
1) Physical description of the BMP;
2) Site conditions that must be met for effective use of the BMP;
3) BMP installation/construction procedures, including typical drawings; and
4) Operation and maintenance procedures and schedules for the BMP.
(b) The SWPPP shall provide the following information for each specific instance where a BMP is to be installed:
1) Whether the BMP is temporary or permanent;
2) When the BMP will be installed in relation to each phase of the land disturbance procedures to complete the project; and
3) Site conditions that must be met before removal of the BMP if the BMP is not a permanent BMP.

5. Structural BMP Installation: The permittee shall ensure all BMPs are properly installed and operational at the locations and relative times specified in the SWPPP.
(a) Perimeter control BMPs for runoff from disturbed areas shall be installed before general site clearing is started. Note this requirement does not apply to earth disturbances related to initial site clearing and establishing entry, exit, or access of the site, which may require that stormwater controls be installed immediately after the earth

disturbance.
(b) For phased projects, BMPs shall be properly installed as necessary prior to construction activities.
(c) Stormwater discharges which leave the site from disturbed areas shall pass through an appropriate impediment to sediment movement such as a sedimentation basin, sediment traps (including vegetative buffers), or silt fences prior to leaving the land disturbance site.
(d) A drainage course change shall be clearly marked on a site map and described in the SWPPP.
(e) If vegetative stabilization measures are being implemented, stabilization efforts are considered "installed" when all activities necessary to seed or plant the area are completed. Vegetative stabilization is not considered "operational" until the vegetation is established.

6. Install sediment controls along any perimeter areas of the site that are downgradient from any exposed soil or other disturbed areas. Prevent stormwater from circumventing the edge of the perimeter control. For sites where perimeter controls are infeasible, other practices shall be implemented to minimize discharges to perimeter areas of the site.

7. For surface waters of the state, defined in Section 644.016.1(27) RSMo, located on or adjacent to the site, the permittee must maintain a riparian buffer or structural equivalent in accordance with at least one of the following options. The selection and location must be described in the SWPPP.
   (a) Provide and maintain a 50-foot undisturbed natural buffer; or
   (b) Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or
   (c) If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.
   (d) The permittee is not required to comply with (a), (b), or (c) above if one or more of the following exceptions apply and documentation is provided in the SWPPP:
      1) As authorized per CWA Section 404 Department of the Army permit and its associated Section 401 Water Quality Certification from the Department.
      2) If there is no discharge of stormwater to waters of the state through the area between the disturbed portions of the site and waters of the state located within 50 feet of the site. This includes situations where the permittee has implemented permanent control measures that will prevent such discharges, such as a berm or other barrier.
      3) Where no natural buffer exists due to preexisting development disturbances that occurred prior to the initiation of planning for the current development of the site.
         a. Where some natural buffer exists but portions of the area within 50 feet of the waters of the state are occupied by preexisting development disturbances the permittee is required to comply with (a), (b), or (c) above.
      4) For linear projects where site constraints make it infeasible to implement a buffer or equivalent provided the permittee limit disturbances within 50 feet of any waters of the state and/or the permittee provides supplemental erosion and sediment controls to treat stormwater discharges from earth disturbances within 50 feet of the water of the state. The permittee must also document in the SWPPP the rationale for why it is infeasible for the permittee to implement (a), (b), or (c) and describe any buffer width retained and supplemental BMPs installed.
   (e) Where the permittee is retaining a buffer of any size, the buffer should be measured perpendicularly from any of the following points, whichever is further landward from the water:
      1) The ordinary high water mark of the water body, defined as the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris; or
      2) The edge of the stream or river bank, bluff, or cliff, whichever is applicable.

8. Slopes for disturbed areas must be identified in the SWPPP. A site map or maps defining the sloped areas for all phases of the project must be included in the SWPPP. The disturbance of steep slopes shall be minimized.
9. Manage stockpiles or land clearing debris piles composed, in whole or in part, of sediment and/or soil.
   (a) Locate the piles outside of any natural buffers zones, established under the condition above, and away from any stormwater conveyances, drain inlets, and areas where stormwater flow is concentrated;
   (b) Install a sediment barrier along all downgradient perimeter areas;
   (c) Divert surface flows around stockpiles to reduce and minimize erosion of the stockpile.

(d) For piles that will be unused for 14 or more days, provide cover with appropriate temporary stabilization in accordance with Part V. BMP REQUIREMENTS, Condition 13.
(e) Rinsing, sweeping, or otherwise placing any soil, sediment, debris, or stockpiled product which has accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or water of the state is prohibited.

10. The site shall include BMPs for pollution prevention measures and shall be noted in the SWPPP. At minimum such measures must be designed, installed, implemented, and maintained to:
(a) Minimize the discharge of pollutants from equipment and vehicle rinsing; no detergents, additives, or soaps of any kind shall be discharged. Rinse waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
(b) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on the site to precipitation and to stormwater;
(c) Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures, including, but not limited to, the installation of containment berms and use of drip pans at petroleum product and liquid storage tanks and containers; and
(d) Prevent discharges from causing or contributing to an exceedance of water quality standards including general criteria.

11. Sedimentation Basins: The SWPPP shall include a sedimentation basin for each drainage area with ten or more acres disturbed at one time.
(a) The sedimentation basin shall be sized, at a minimum, to treat a local 2-year, 24-hour storm.
(b) Sediment basins shall not be constructed in any waters of the state or natural buffer zones.
(c) Discharges from dewatering activities shall be managed by appropriate controls. The SWPPP shall include a description of any anticipated dewatering methods and specific BMPs designed to treat dewatering water.
    1) Appropriate controls include, but are not limited to, sediment socks, dewatering tanks, tube settlers, weir tanks, filtration systems (e.g. bag or sand filters), and passive treatment systems that are designed to remove or retain sediment.
    2) Erosion controls and velocity dissipation devices (e.g., check dams, riprap, and vegetated buffers) to minimize erosion at inlets, outlets, and discharge points from shall be utilized.
    3) Water with an oil sheen shall not be discharged and shall be marked in SWPPP.
    4) Visible floating solids and foam shall not be discharged.
(d) Until final stabilization has been achieved, sediment basins and impoundments shall utilize outlet structures or floating skimmers that withdraw water from the surface when discharging.
    1) Under frozen conditions, it may be considered infeasible to withdraw water from the surface and an exception can be made for that specific period as long as discharges that may contain sediment and other pollutants are managed by appropriate controls. If determined infeasible due to frozen conditions, documentation must be provided in the SWPPP to support the determination, including the specific conditions or time period when this exception applies.
(e) Accumulated sediment shall not exceed 50% of total volume or as prescribed in the design, whichever is less. Note in the SWPPP the locations for disposal of the material removed from sediment basins.
(f) Prevent discharges to the receiving stream causing excessive visual turbidity. For the purposes of this permit, visual turbidity refers to a sediment plume or other cloudiness in the water caused by sediment that can be identified by an observer.
(g) The SWPPP shall require the basin be maintained until final stabilization of the disturbed area served by the basin.

Where use of a sediment basin is infeasible, the SWPPP shall evaluate and specify other similarly effective BMPs to be employed to control erosion and sediment. These similarly effective BMPs shall be selected from appropriate BMP guidance documents authorized by this permit. The BMPs must provide equivalent water quality protection to achieve compliance with this permit. The SWPPP shall require both temporary and permanent sedimentation basins to have a stabilized spillway to minimize the potential for erosion of the spillway or basin embankment.

12. Soil disturbing activities on site that have ceased either temporarily or permanently shall initiate stabilization immediately in accordance with the options below. For soil disturbing activities that have been temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days:
    (a) The permittee shall construct BMPs to establish interim stabilization; and
    (b) Stabilization must be initiated immediately and completed within 14 calendar days.
    (c) For soil disturbing activities that have been permanently ceased on any portion of the site, final stabilization of disturbed areas must be initiated immediately and completed within 14 calendar days.
        1) Allowances to the 14-day completion period for temporary and final stabilization may be made due to weather and equipment malfunctions. The use of allowances shall be documented in the SWPPP. Allowances may be determined unnecessary after review by the Department.
    (d) Until stabilization is complete, interim sediment control shall consist of well-established and maintained BMPs that are reasonably certain to protect waters of the state from sediment pollution over an extended period of time. This may require adding more BMPs to an area than is normally used during daily operations. The types of BMPs used must be suited to the area disturbed, taking into account the number of acres exposed and the steepness of the slopes. If the slope of the area is greater than 3:1 (three feet horizontal to one foot vertical), then the permittee shall establish interim stabilization within seven days of ceasing operations on that part of the site. The following activities would constitute the immediate initiation of stabilization:
        1) Prepping the soil for vegetative or non-vegetative stabilization as long as seeding, planting, and/or installation of non-vegetative stabilization products takes place as soon as practicable;
        2) Applying mulch or other non-vegetative product to the exposed areas;
        3) Seeding or planting the exposed areas;
        4) Finalizing arrangements to have stabilization product fully installed in compliance with the deadlines for completing stabilization.
    (e) If vegetative stabilization measures are being implemented, stabilization is considered “installed” when all activities necessary to seed or plant the area are completed. Installed does not mean established.
    (f) If non-vegetative stabilization measures are being implemented, stabilization is considered “installed” when all such measures are implemented or applied.
        1) Non-vegetative stabilization shall prevent erosion and shall be chosen for site conditions, such as slope and flow of stormwater.
    (g) Final stabilization is not considered achieved until vegetation has grown and established to meet the requirements below.

13. Prior to removal of BMPs, ceasing site inspections, and removing from the quarterly report, final stabilization must be achieved. Final stabilization shall be achieved as soon as possible once land disturbance activities have ceased. Document in the SWPPP the type of stabilization and the date final stabilization is achieved.
    (a) The project is considered to have achieved final stabilization when perennial vegetation (excluding volunteer vegetation), pavement, buildings, or structures using permanent materials (e.g., riprap, gravel, etc.) cover all areas that have been disturbed. With respect to areas that have been vegetated, vegetation must be at least 70% coverage of 100% of the vegetated areas on site. Vegetation must be evenly distributed.
    (b) Disturbed areas on agricultural land are considered to have achieved final stabilization when they are restored to their preconstruction agricultural use. If former agricultural land is changing to non-agricultural use, this is no longer considered agricultural land and shall follow condition (a).
    (c) If the intended function of a specific area of the site necessitates that it remain disturbed, final stabilization is considered achieved if all of the following are met:
        1) Only the minimum area needed remains disturbed (i.e., dirt access roads, motocross tracks, utility pole pads, areas being used for storage of vehicles, equipment, materials). Other areas must meet the criteria above.

2) Permanent structural BMPs (e.g., rock checks, berms, grading, etc.) or non-vegetative stabilization measures are implemented and designed to prevent sediment and other pollutants from entering waters of the state.
3) Inspection requirements in Part IV. SWPPP MANAGEMENT REQUIREMENT, Condition 11 are met and documented in the SWPPP.

(d) Winter weather and frozen conditions do not excuse any of the above final stabilization requirements. If vegetation is required for stabilization the permittee must maintain BMPs throughout winter weather and frozen conditions until thawing and vegetation meets final stabilization criteria above. Document stabilization attempts during frozen conditions in the SWPPP. Consider future freezing when removing vegetation and plan with temporary stabilization techniques before the ground becomes frozen.

VI. SITE FINALIZATION & PERMIT TERMINATION

1. Until a site is finalized, the permittee must comply with all conditions in the permit, including continuation of site inspections and reporting quarterly to the Department. To finalize the site and remove from this permit coverage, the site shall meet the following requirements:
   (a) For any areas that (1) were disturbed during construction, (2) are not covered over by permanent structures, and (3) over which the permittee had control during the construction activities, the requirements for final vegetative or non-vegetative stabilization in Part V. BMP REQUIREMENTS, Condition 13;
   (b) The permittee has removed and properly disposed of all construction materials, waste, and waste handling devices and has removed all equipment and vehicles that were used during construction, unless intended for long-term beyond construction phase;
   (c) The permittee has removed all temporary BMPs that were installed and maintained during construction, except those that are intended for long-term use or those that are biodegradable; and
   (d) The permittee has removed all potential pollutants and pollutant-generating activities associated with construction, unless needed for long-term use following the construction activities.

2. The permit may be terminated if;
   (a) There has been a transfer of control of all areas of the site for which the current permittee is responsible under this permit to another operator, and that operator has obtained coverage under this permit;
   (b) Active sites obtain coverage under an individual or alternative general NPDES permit, with land disturbance conditions; or
   (c) This permit may be terminated when all projects covered under this permit are finalized. In order to terminate the permit, the permittee shall notify the Department by submitting a Request for Termination along with the final quarterly report for the current calendar quarter.

VII. REPORTING AND SAMPLING REQUIREMENTS

1. The permittee is not required to sample stormwater under this permit. The Department may require sampling and reporting as a result of illegal discharges, compliance issues related to water quality concerns, or evidence of off-site impacts from activities at a site. If such an action is needed, the Department will specify in writing the sampling requirements, including such information as location and extent. If the permittee refuses to perform sampling when required, the Department may terminate the general permit and require the facility to obtain a site-specific permit with sampling requirements.

2. Electronic Discharge Monitoring Report (eDMR) Submission System. The NPDES Electronic Reporting Rule, 40 CFR Part 127, reporting of any report required by the permit shall be submitted via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data for the NPDES program. The eDMR system is currently the only Department-approved reporting method for this permit unless specified elsewhere in this permit, or a waiver is granted by the Department. The facility must register in the Department's eDMR system through the Missouri Gateway for Environmental Management (MoGEM) before the first report is due.

3. Permittees shall prepare a quarterly report with a list of active land disturbance sites including any off-site borrow or depositional areas associated with the construction project and submit the following information electronically as an

attachment to the eDMR system until such a time when the current or a new system is available to allow direct input of the data:

(a) The name of the project;
(b) The location of the project (including the county);
(c) The name of the primary receiving water(s) for each project;
(d) A description of the project;
(e) The number of acres disturbed;
(f) The percent of completion of the project; and
(g) The projected date of completion.

The quarterly report(s) shall be maintained by the permittee and readily available for review by the Department at the address provided on the application as well as submitted quarterly via the Department's eDMR system. The permittee shall submit quarterly reports according to Table A.

Table A	**Schedule for Quarterly Reporting**
Activity for the months of:	Report is due:
January, February, March (1st Quarter)	April 28
April, May, June (2nd Quarter)	July 28
July, August, September (3rd Quarter)	October 28
October, November, December (4th Quarter)	January 28

VIII. STANDARD PERMIT CONDITIONS

1. Records: The permittee shall retain copies of this general permit, the SWPPP and all amendments for the site named in the State Operating Permit, results of any monitoring and analysis, and all site inspection records required by this general permit.
   (a) The records shall be accessible during normal business hours and retained for a period of at least three (3) years from the date of termination.
   (b) The permittee shall provide a copy (electronic or otherwise) of the SWPPP to the Department, USEPA, or any local agency or government representative if they request a copy in the performance of their official duties within 24 hours of the request (or next working day), unless given more time by the representative.
   (c) The permittee shall provide a copy of the SWPPP to those who are responsible for installation, operation, or maintenance of any BMP. The permittee, their representative, and/or the contractor(s) responsible for installation, operation and maintenance of the BMPs shall have a current copy of the SWPPP with them when on the project site.

2. Land Ownership and Change of Ownership: Federal and Missouri stormwater regulations [10 CSR 20-6.200(1) (B)] require a stormwater permit and erosion control measures for all land disturbances of one or more acres. These regulations also require a permit for less than one acre lots if the lot is part of a larger common plan of development or sale where that plan is at least one acre in size.
   (a) If the permittee sells any portion of a permitted site to a developer for commercial, industrial, or residential use, this land remains a part of the common sale and the new owner must obtain a permit prior to conducting any land disturbance activity. Therefore, the original permittee must amend the SWPPP to show that the property has been sold and, therefore, no longer under the original permit coverage.
   (b) Property of any size which is part of a larger common plan of development where the property has achieved final stabilization and the original permit terminated will require application of a new land disturbance permit for any future land disturbance activity unless the activity is by an individual residential building lot owner on a site less than one acre.
   (c) If a portion of a larger common plan of development is sold to an individual for the purpose of building his or her own private residence, a permit is required if the portion of land sold is equal to or greater than one acre. No permit is required, however, for less than one acre of land sold.

3. Permit Transfer: This permit may not be transferred to a new owner.

4. Termination: This permit may be terminated when the project has achieved final stabilization, defined in Part VI. SITE FINALIZATION & PERMIT TERMINATION.
   (a) In order to terminate the permit, the permittee shall notify the Department by submitting the form Request for Termination of Operating Permit Form MO 780-2814. The form should be submitted to the appropriate regional office or through an approved electronic system if it should become available.
   (b) The Cover Page (Certificate Page) of the Master General Permit for Land Disturbance specifies the "effective date" and the "expiration date" of the Master General Permit. The "issued date" along with the "expiration date" will appear on the State Operating Permit issued to the applicant. **This permit does not continue administratively beyond the expiration date.**

5. Duty to Reapply: If the project or development completion date will be after the expiration date of this general permit, then the permittee must reapply to the Department for a new permit. This permit may be applied for and issued electronically in accordance with Section 644.051.10, RSMo.
   (a) Due to the nature of the electronic permitting system, a period of time may be granted at the discretion of the Department in order to apply for a new permit after the new version is effective. Applicants must maintain appropriate best management practices and inspections during the discretionary period.

6. Duty to Comply: The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Missouri Clean Water Law and Federal Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

7. Modification, Revocation, and Reopening:
   (a) If at any time the Department determines that the quality of waters of the state may be better protected by reopening this permit, or revoking this permit and requiring the owner/operator of the permitted site to apply for a site-specific permit, the Department may revoke a general permit and require any person to obtain such an operating permit as authorized by 10 CSR20-6.010(13) and 10 CSR 20-6.200(1)(B).
   (b) If this permit is reopened, modified, or revoked pursuant to this Section, the permittee retains all rights under Chapter 536 and 644 Revised Statutes of Missouri upon the Department's reissuance of the permit as well as all other forms of administrative, judicial, and equitable relief available under law.

8. Other Information: Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

9. Duty to Provide Information: The permittee shall furnish to the Department, within 24 hours unless explicitly granted more time in writing, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.

10. Inspection and Entry: The permittee shall allow the Department, or an authorized representative (including an authorized contractor acting as a representative of the Department), upon presentation of credentials and other documents as may be required by law, to:
    (a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of the permit;
    (b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
    (c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
    (d) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Federal Clean Water Act or Missouri Clean Water Law, any substances or parameters at any location.

11. Signatory Requirement:
    (a) All permit applications, reports required by the permit, or information requested by the Department shall be signed and certified. (See 40 CFR 122.22 and 10 CSR 20-6.010)
    (b) The Federal Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit (including monitoring reports or reports of compliance or non-compliance) shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six (6) months per violation, or by both.
    (c) The Missouri Clean Water Law provides that any person who knowingly makes any false statement, representation or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than ten thousand dollars, or by imprisonment for not more than six months, or by both.

12. Property Rights: This permit does not convey any property rights of any sort or any exclusive privilege.

13. Notice of Right to Appeal: If you were adversely affected by this decision, you may be entitled to pursue an appeal before the administrative hearing commission (AHC) pursuant to Sections 621.250 and 644.051.6 RSMo. To appeal, you must file a petition with the AHC within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Any appeal should be directed to:

Administrative Hearing Commission
U.S. Post Office Building, Third Floor
131 West High Street, P.O. Box 1557
Jefferson City, MO 65102-1557
Phone: 573-751-2422
Fax: 573-751-5018
Website: https://ahc.mo.gov

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

STORMWATER DISCHARGES FROM THIS LAND DISTURBANCE SITE ARE AUTHORIZED BY THE MISSOURI STATE OPERATING PERMIT NUMBER:

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ANYONE WITH QUESTIONS OR CONCERNS ABOUT STORMWATER DISCHARGES FROM THIS SITE, PLEASE CONTACT THE MISSOURI DEPARTMENT OF NATURAL RESOURCES AT

1-800-361-4827

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FACT SHEET FOR MASTER GENERAL PERMIT
MO-R100XXX

The Federal Water Pollution Control Act [Clean Water Act (CWA)] Section 402 of Public Law 92-500 (as amended) established the National Pollution Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States and the release of stormwater from certain point sources. All such discharges are unlawful without a permit (Section 301 of the CWA). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Missouri State Operating Permits (MSOPs) are issued by the Missouri Department of Natural Resources (Department) under an approved program operated in accordance with federal and state laws (Federal CWA and Missouri Clean Water Law Section 644 as amended). Permits are issued for a period of five (5) years unless otherwise specified.

Per 40 CFR 124.56, 40 CFR 124.8, and 10 CSR 20-6.020(1)(A)2, a Fact Sheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the permit. A Fact Sheet is not an enforceable part of an MSOP.

DEFINITIONS FOR THE PURPOSES OF THIS PERMIT:

Common Promotional Plan: A plan undertaken by one (1) or more persons to offer lots for sale or lease; where land is offered for sale by a person or group of persons acting in concert, and the land is contiguous or is known, designated, or advertised as a common unit or by a common name or similar names, the land is presumed, without regard to the number of lots covered by each individual offering, as being offered for sale or lease as part of a common promotional plan.

Dewatering: The act of draining rainwater and/or groundwater from basins, building foundations, vaults, and trenches.

Effective Operating Condition: For the purposes of this permit, a stormwater control is kept in effective operating condition if it has been implemented and maintained in such a manner that it is working as designed to minimize pollutant discharges.

Emergency-Related Project: A project initiated in response to a public emergency (e.g. earthquakes, extreme flooding conditions, tornado, disruptions in essential public services, pandemic) for which the related work requires immediate authorization to avoid imminent endangerment to human health/safety or the environment or to reestablish essential public services.

Exposed Soils: For the purposes of this permit, soils that as a result of earth-disturbing activities are left open to the elements.

Immediately: For the purposes of this permit, immediately should be defined as within 24 hours.

Impervious Surface: For the purpose of this permit, any land surface with a low or no capacity for soil infiltration including, but not limited to, pavement, sidewalks, parking areas and driveways, packed gravel or soil, or rooftops.

Infeasible: Infeasible means not technologically possible or not economically practicable and achievable in light of best industry practices.

Install or Installation: When used in connection with stormwater controls, to connect or set in position stormwater controls to make them operational.

Land Disturbance Site or Site: The land or water area where land disturbance activities will occur and where stormwater controls will be installed and maintained. The land disturbance site includes construction support activities, which may be located at a different part of the property from where the primary land disturbance activity will take place or on a different piece of property altogether. Off-site borrow areas directly and exclusively related to the land disturbance activity are part of the site and must be permitted.

Larger Common Plan of Development or Sale: A continuous area where multiple separate and distinct construction activities are occurring under one plan, including any off-site borrow areas that are directly and exclusively related to the land disturbance activity. Off-site borrow areas utilized for multiple different land disturbance projects are considered their own entity and are not part of the larger common plan of development or sale. See definition of Common Promotional Plan to understand what a 'common plan' is.

Minimize: To reduce and/or eliminate to the extent achievable using stormwater controls that are technologically available and economically practicable and achievable in light of best industry practices.

Non-structural Best Management Practices (BMPs): Institutional, educational, or pollution prevention practices designed to limit the amount of stormwater runoff or pollutants that are generated in the landscape. Examples of non-structural BMPs include picking up trash and debris, sweeping up nearby sidewalks and streets, maintaining equipment, and training site staff on stormwater control practices.

Operational: for the purposes of this permit, stormwater controls are made "operational" when they have been installed and implemented, are functioning as designed, and are properly maintained.

Ordinary High Water Mark: The line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris.

Peripheral: For the purposes of this permit, peripheral should be defined as the outermost boundary of the area that will be disturbed.

Permanently: For the purposes of this permit, permanently is defined as any activity that has been ceased without any intentions of future disturbance.

Pollution Prevention Controls (or Measures): Stormwater controls designed to reduce or eliminate the addition of pollutants to construction site discharges through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

Qualified Person (inspections): A person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

Stormwater Control (also referred to as sediment/erosion controls): refers to any temporary or permanent BMP or other method used to prevent or reduce the discharge of pollutants to waters of the state.

Structural BMP: Physical sediment/erosion controls working individually or as a group (treatment train) appropriate to the source, location, and area climate for the pollutant to be controlled. Examples of structural BMPs include silt fences, sedimentation ponds, erosion control blankets, and seeding.

Temporary Stabilization: A condition where exposed soils or disturbed areas are provided temporary vegetation and/or non-vegetative protective cover to prevent erosion and sediment loss. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either final stabilization can be achieved or until further construction activities take place to re-disturb this area.

Treatment Train: A multi-BMP approach to managing the stormwater volume and velocity and often includes erosion prevention and sediment control practices often applied when the use of a single BMP is inadequate in preventing the erosion and transport of sediment. A good option to utilize as a corrective action.

Volunteer Vegetation: A volunteer plant is a plant that grows on its own, rather than being deliberately planted for stabilization purposes. Volunteers often grow from seeds that float in on the wind, are dropped by birds, or are inadvertently mixed into soils. Commonly, volunteer vegetation is referred to as 'weeds'. This does not meet the requirements for final stabilization.

Waters of the State: Section 644.016.1(27) RSMo. defines waters of the state as, "All waters within the jurisdiction of this state, including all rivers, streams, lakes and other bodies of surface and subsurface water lying within or forming a part of the boundaries of the state which are not entirely confined and located completely upon lands owned, leased or otherwise controlled by a single person or by two or more persons jointly or as tenants in common."

PART I – BASIC PERMIT INFORMATION

Facility Type:	Industrial Stormwater; Land Disturbance
Facility SIC Code(s):	1629
Facility Description:	Construction or land disturbance activity (e.g., clearing, grubbing, excavating, grading, filling, and other activities that result in the destruction of the root zone and/or land disturbance activity that is reasonably certain to cause pollution to waters of the state).

This permit establishes a Stormwater Pollution Prevention Plan (SWPPP) requirement for pollutants of concern from this type of facility or for all facilities and sites covered under this permit. 10 CSR 20-6.200(7) specifies "general permits shall contain BMP requirements and/or monitoring and reporting requirements to keep the stormwater from becoming contaminated".

Land disturbance activities include clearing, grubbing, excavating, grading, filling and other activities that result in the destruction of the root zone and/or other activities that are reasonably certain to cause pollution to waters of the state. A Missouri State Operating Permit for land disturbance permit is required for construction disturbance activities of one or more acres or for construction activities that disturb less than one acre when they are part of a larger common plan of development or sale that will disturb a cumulative total of one or more acres over the life of the project.

The primary requirement of a land disturbance permit is the development of a SWPPP which incorporates site-specific BMPs to minimize soil exposure, soil erosion, and the discharge of pollutants. The SWPPP ensures the design, implementation, management, and maintenance of BMPs in order to prevent sediment and other pollutants from leaving the site.

When it precipitates, stormwater washes over the loose soil on a construction site and various other materials and products being stored outside. As stormwater flows over the site, it can pick up pollutants like sediment, debris, and chemicals from the loose soil and transport them to nearby storm sewer systems or directly into rivers, lakes, or coastal waters.

The Missouri Department of Natural Resources is responsible for ensuring that construction site operators have the proper stormwater controls in place so that construction can proceed in a way that protects your community's clean water and the surrounding environment. One way the department helps protect water quality is by issuing land disturbance permits.

Local conditions are not considered when developing conditions for a general permit. A facility may apply for a site-specific permit if they desire a review of site-specific conditions.

PART II – RECEIVING STREAM INFORMATION

APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:
Per Missouri Effluent Regulations (10 CSR 20-7.015), the waters of the state are divided into seven (7) categories. This permit applies to facilities discharging to the following water body categories:

- ✓ Missouri or Mississippi River [10 CSR 20-7.015(2)]
- ✓ Lakes or Reservoirs [10 CSR 20-7.015(3)]
- ✓ Losing Streams [10 CSR 20-7.015(4)]
- ✓ Metropolitan No-Discharge Streams [10 CSR 20-7.015(5)]
- ✓ Special Streams [10 CSR 20-7.015(6)]
- ✓ Subsurface Waters [10 CSR 20-7.015(7)]
- ✓ All Other Waters [10 CSR 20-7.015(8)]

Missouri Water Quality Standards (10 CSR 20-7.031) defines the Clean Water Commission water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and/or 1st classified receiving stream's designated water uses shall be maintained in accordance with 10 CSR 20-7.031(24). A general permit does not take into consideration site-specific conditions.

MIXING CONSIDERATIONS:
This permit applies to receiving streams of varying low flow conditions. Therefore, the effluent limitations must be based on the smallest low flow streams considered, which includes waters without designated uses. As such, no mixing is allowed [10 CSR 20-7.031(5)(A)4.B.(I)(a)]. No Zone of Initial Dilution is allowed. [10 CSR 20-7.031(5)(A)4.B.(I)(b)].

RECEIVING STREAM MONITORING REQUIREMENTS:
There are no receiving water monitoring requirements recommended at this time.

PART III – RATIONALE AND DERIVATION OF EFFLUENT LIMITATIONS & PERMIT CONDITIONS

305(B) REPORT, 303(d) LIST, & TOTAL MAXIMUM DAILY LOAD (TMDL):
Section 305(b) of the Federal CWA requires each state identify waters not meeting Water Quality Standards and for which adequate water pollution controls have not been required. Water Quality Standards protect such beneficial uses of water as whole body contact, maintaining fish and other aquatic life, and providing drinking water for people, livestock, and wildlife. The 303(d) list helps state and federal agencies keep track of waters which are impaired but not addressed by normal water pollution control programs.

A TMDL is a calculation of the maximum amount of a given pollutant a body of water can absorb before its water quality is affected. If a water body is determined to be impaired as listed on the 303(d) list, then a watershed management plan will be developed which shall include the TMDL calculation. For facilities with an existing general permit before a TMDL is written on their receiving stream, the Department will evaluate the permit and may require any facility authorized by this general permit to apply for and obtain a site-specific operating permit.

ANTI-BACKSLIDING:
A provision in the Federal Regulations [CWA Section 303(d)(4); CWA Section 402(c); 40 CFR Part 122.44(I)] requires a reissued permit to be as stringent as the previous permit with some exceptions.
✓ Not Applicable: All effluent limitations in this permit are at least as protective as those previously established.

ANTIDEGRADATION:
Antidegradation policies ensure protection of water quality for a particular water body on a pollutant by pollutant basis to ensure Water Quality Standards are maintained to support beneficial uses such as fish and wildlife propagation and recreation on and in the water. This also includes special protection of waters designated as an Outstanding National Resource Water or Outstanding State Resource Water [10 CSR 20-7.031(3)(C)]. Antidegradation policies are adopted to minimize adverse effects on water.

The Department has determined the best avenue forward for implementing the Antidegradation requirements into general stormwater permits is by requiring the appropriate development and maintenance of a SWPPP. The SWPPP must identify all reasonable and effective BMPs, taking into account environmental impacts and costs. This analysis must document why no discharge or no exposure options are not feasible at the facility. This selection and documentation of appropriate control measures will then serve as the analysis of alternatives and fulfill the requirements of the Antidegradation Rule and Implementation Procedure 10 CSR 20-7.031(3) and 10 CSR 20-7.015(9)(A)5.

Any facility seeking coverage under this permit which undergoes expansion or discharges a new pollutant of concern must update their SWPPP and select reasonable and cost effective new BMPs. New facilities seeking coverage under this permit are required to develop a SWPPP including this analysis and documentation of appropriate BMPs. Renewal of coverage for a facility requires a review of the SWPPP to ensure the selected BMPs continue to be appropriate.
✓ Applicable; the facility must review and maintain stormwater BMPs as appropriate.

BENCHMARKS:
When a permitted feature or outfall consists of only stormwater, a benchmark may be implemented at the discretion of the permit writer. Benchmarks require the facility to monitor and, if necessary, replace and update stormwater control measures. Benchmark concentrations are not effluent limitations. A benchmark exceedance, therefore, is not a permit violation; however, failure to take corrective action is a violation of the permit. Benchmark monitoring data is used to determine the overall effectiveness of control measures and to assist the permittee in knowing when additional corrective actions may be necessary to comply with the limitations of the permit.
✓ Not applicable; this permit does not contain numeric benchmarks.

BEST MANAGEMENT PRACTICES (BMPS):
Minimum site-wide BMPs are established in this permit to ensure all permittees are managing their sites equally to protect waters of the state from certain activities which could cause negative effects in receiving water bodies. While not all sites require a SWPPP because the SIC codes are specifically exempted in 40 CFR 122.26(b)(14), these BMPs are not specifically included for stormwater purposes. These practices are minimum requirements for all industrial sites to protect waters of the state. If the minimum BMPs are not followed, the facility may violate general criteria [10 CSR 20-7.031(4)]. Statutes are applicable to all permitted facilities in the state; therefore, pollutants cannot be released unless in accordance with RSMo 644.011 and 644.016 (17).

CHANGES IN DISCHARGES OF TOXIC POLLUTANT:
This special condition reiterates the federal rules found in 40 CFR 122.44(f) and 122.42(a)(1). In these rules, the facility is required to report changes in amounts of toxic substances discharged. Toxic substances are defined in 40 CFR 122.2 as "…any pollutant listed as toxic under section 307(a)(1) or, in the case of "sludge use or disposal practices," any pollutant identified in regulations implementing section 405(d) of the CWA." Section 307 of the CWA then refers to those parameters found in 40 CFR 401.15.

The permittee should also consider any other toxic pollutant in the discharge as reportable under this condition.

EFFLUENT LIMITATION GUIDELINE:
Effluent Limitation Guidelines, or ELGs, are found at 40 CFR 400-499. These are limitations established by the EPA based on the SIC code and the type of work a facility is conducting. Most ELGs are for process wastewater and some address stormwater. All are technology based limitations which must be met by the applicable facility at all times.

✓ The industries covered under this permit have an associated Effluent Limit Guideline (ELG) which is applicable to the stormwater discharges in this permit and is applied under 40 CFR 125.3(a).

ELECTRONIC DISCHARGE MONITORING REPORT (EDMR) SUBMISSION SYSTEM:
The U.S. Environmental Protection Agency (EPA) promulgated a final rule on October 22, 2015, to modernize CWA reporting for municipalities, industries, and other facilities by converting to an electronic data reporting system. The final rule requires regulated entities and state and federal regulators to use information technology to electronically report data required by the National Pollutant Discharge Elimination System (NPDES) permit program instead of filing paper reports. To comply with the federal rule, the Department is requiring all permittees to begin submitting discharge monitoring data and reports online.

✓ Applicable; this permit requires quarterly reports.

GENERAL CRITERIA CONSIDERATIONS:
In accordance with 40 CFR 122.44(d)(1), effluent limitations shall be placed into permits for pollutants determined to cause, have reasonable potential to cause, or to contribute to, an excursion above any water quality standard, including narrative water quality criteria. In order to comply with this regulation, the permit writer has completed a reasonable potential determination on whether discharges have reasonable potential to cause or contribute to an excursion of the general criteria listed in 10 CSR 20-7.031(4). In instances where reasonable potential exists, the permit includes limitations within the permit to address the reasonable potential. In discharges where reasonable potential does not exist, the permit may include monitoring to later determine the discharge's potential to impact the narrative criteria. Additionally, RSMo 644.076.1, as well as Standard Permit Conditions Part VIII of this permit state it shall be unlawful for any person to cause or allow any discharge of water contaminants from any water contaminant or point source located in Missouri in violation of sections 644.006 to 644.141 of the Missouri Clean Water Law or any standard, rule, or regulation promulgated by the commission.

LAND APPLICATION:
Land application, or surficial dispersion of wastewater and/or sludge, is performed by facilities to maintain a basin as no-discharge. Requirements for these types of operations are found in 10 CSR 20-6.015; authority to regulate these activities is from RSMo 644.026.

✓ Not applicable; this permit does not authorize operation of a surficial land application system to disperse wastewater or sludge.

LAND DISTURBANCE:
Land disturbance, sometimes called construction activities, are actions which cause disturbance of the root layer or soil; these include clearing, grading, and excavating of the land. 40 CFR 122.26(b)(14) and 10 CSR 20-6.200(3) requires permit coverage for these activities. Coverage is not required for facilities when only providing maintenance of original line and grade, hydraulic capacity, or to continue the original purpose of the facility.

✓ Applicable; this permit provides coverage for land disturbance activities. These activities have SWPPP requirements and may be combined with the standard site SWPPP. Land disturbance BMPs should be designed to control the expected peak discharges. The University of Missouri has design storm events for the 25 year 24 hour storm; these can be found at: http://ag3.agebb.missouri.edu/design_storm/comparison_reports/20191117_25yr_24hr_comparison_table.htm; to calculate peak discharges, the website https://www.lmnoeng.com/Hydrology/rational.php has the rational equation to calculate expected discharge volume from the peak storm events.

NUTRIENT MONITORING:
Nutrient monitoring is required for facilities characteristically or expected to discharge nutrients (nitrogenous compounds and/or phosphorus) when the design flow is equal to or greater than 0.1 MGD per 10 CSR 20-7.015(9)(D)8.

- ✓ This is a stormwater only permit; therefore, it is not subject to provisions found in 10 CSR 20-7.015 per 10 CSR 20-7.015(1)(C).

OIL/WATER SEPARATORS:
Oil water separator (OWS) tank systems are frequently found at industrial sites where process water and stormwater may contain oils and greases, oily wastewaters, or other immiscible liquids requiring separation. Food industry discharges typically require pretreatment prior to discharge to municipally owned treatment works. Per 10 CSR 26-2.010(2)(B), all oil water separator tanks must be operated according to manufacturer's specifications and authorized in NPDES permits per 10 CSR 26-2.010(2) or may be regulated as a petroleum tank.

- ✓ Not applicable; this permit does not authorize the operation of OWS. The facility must obtain a separate permit to cover operation of and discharge from these devices.

PERMIT SHIELD:
The permit shield provision of the CWA (Section 402(k)) and Missouri Clean Water Law (644.051.16 RSMo) provides that when a permit holder is in compliance with its NPDES permit or MSOP, they are effectively in compliance with certain sections of the CWA and equivalent sections of the Missouri Clean Water Law. In general, the permit shield is a legal defense against certain enforcement actions but is only available when the facility is in compliance with its permit and satisfies other specific conditions, including having completely disclosed all discharges and all facility processes and activities to the Department at time of application. It is the facility's responsibility to ensure that all potential pollutants, waste streams, discharges, and activities, as well as wastewater land application, storage, and treatment areas, are all fully disclosed to the Department at the time of application or during the draft permit review process. Subsequent requests for authorization to discharge additional pollutants or expanded or newly disclosed flows, or for authorization for previously unpermitted and undisclosed activities or discharges, will likely require permit modification or may require the facility be covered under a site specific permit.

PRETREATMENT PROGRAM:
This permit does not regulate pretreatment requirements for facilities discharging to an accepting permitted wastewater treatment facility. If applicable, the receiving entity (the publicly owned treatment works - POTW) must ensure compliance with any effluent limitation guidelines for pretreatment listed in 40 CFR Subchapter N per 10 CSR 20-6.100. Pretreatment regulations per RSMo 644.016 are limitations on the introduction of pollutants or water contaminants into publicly owned treatment works or facilities.

- ✓ Not Applicable; the facilities covered under this permit are not required to meet pretreatment requirements under an ELG.

PUBLIC NOTICE OF COVERAGE FOR AN INDIVIDUAL FACILITY:
Public Notice of reissuance of coverage is not required unless the facility is a specific type of facility as defined in 10 CSR 20-6.200(1). The need for an individual public notification process shall be determined and identified in the permit [10 CSR 20-6.020(1)(C)5.].

- ✓ Not applicable; public notice is not required for coverage under this permit to individual facilities. The MGP is public noticed in lieu of individual permit PN requirements.

REASONABLE POTENTIAL ANALYSIS (RPA):
Federal regulation 40 CFR Part 122.44(d)(1)(i) requires effluent limitations for all pollutants which are or may be discharged at a level which will cause or have the reasonable potential to cause or contribute to an in-stream excursion above narrative or numeric water quality standard. In accordance with 40 CFR Part 122.44(d)(iii) if the permit writer determines any given pollutant has the reasonable potential to cause or contribute to an in-stream excursion above the water quality standard, the permit must contain effluent limits for the pollutant.

- ✓ The permit writer reviewed industry materials, available past inspections, and other documents and research to evaluate general and narrative water quality reasonable potential for this permit. Permit writers also use the Department's permit writer's manual, the EPA's permit writer's manual (https://www.epa.gov/npdes/npdes-permit-writers-manual), program policies, and best professional judgment. For each parameter in each permit, the permit writer carefully considers all applicable information regarding technology based effluent limitations, effluent limitation guidelines, and water quality standards. Best professional judgment is based on the experience of the permit writer, cohorts in the Department and resources at the EPA, research, and maintaining continuity of permits if necessary. For stormwater permits, the permit writer is required per 10 CSR 6.200(6)(B)2 to consider: A. application and other information supplied by the permittee; B. effluent guidelines; C. best professional judgment of the permit writer; D. water quality; and E. BMPs.

SCHEDULE OF COMPLIANCE (SOC):
Per § 644.051, RSMo, a permit may be issued with a Schedule of Compliance (SOC) to provide time for a facility to come into compliance with new state or federal effluent regulations, water quality standards, or other requirements. Such a schedule is not allowed if the facility is already in compliance with the new requirement or if prohibited by other statute or regulation. An SOC includes an enforceable sequence of interim requirements (e.g. actions, operations, or milestone events) leading to compliance with the Missouri Clean Water Law, its implementing regulations, and/or the terms and conditions of an operating permit. *See also* Section 502(17) of the CWA, and 40 CFR 122.2. For new effluent limitations, the permit may include interim monitoring for the specific parameter to demonstrate the facility is not already in compliance with the new requirement. Per 40 CFR 122.47(a)(1) and 10 CSR 20-7.031(11), compliance must occur as soon as possible. If the permit provides a schedule for meeting new water quality based effluent limits, an SOC must include an enforceable, final effluent limitation in the permit even if the SOC extends beyond the life of the permit.

- ✓ Not Applicable: This permit does not contain a SOC.

SETBACKS:
Setbacks, sometimes called separation distances, are common elements of permits and are established to provide a margin of safety in order to protect the receiving water and other features from accidents, spills, unusual events, etc. Specific separation distances are included in 10 CSR 20-8 for minimum design standards of wastewater structures. While wastewater is considered separately from stormwater under this permit, the guides and Chapter 8 distances may remain relevant to requirements under this permit if deemed appropriate by the permittee.

- ✓ Discharge to the watersheds of a Metropolitan No-Discharge Stream (10 CSR 20-7.031 Table F) is authorized by this permit if the discharges are in compliance with 10 CSR 20-7.015(5) and 10 CSR 20-7.031(7). Discharges to these watersheds are authorized for uncontaminated stormwater discharges only.
- ✓ This permit authorizes stormwater discharges which are located in a way to allow water to be released into sinkholes, caves, fissures, or other openings in the ground which could drain into aquifers (except losing streams) per 10 CSR 20-7.015(7). It is the best professional judgment of the permit writer to allow discharges to losing streams as the effluent is stormwater only.
- ✓ This permit authorizes stormwater discharge in the watersheds of Outstanding state Resource Waters (OSRW); Outstanding National Resources Waters (ONRW), which includes the Ozark National Riverways and the National Wild and Scenic Rivers System; and impaired waters as designated in the 305(b) Report provided no degradation of water quality occurs in the OSRW and ONRW due to discharges from the permitted facility per 10 CSR 20-7.015(6)(B) and 10 CSR 20-7.031(3)(C). Additionally, if the facility is found to be causing degradation or contributing to an impairment by discharging a pollutant of concern during an inspection or through complaint investigations, they will be required to become a no discharge facility or obtain a site specific permit with more stringent monitoring and SWPPP requirements. Missouri's impaired waters can be found at https://dnr.mo.gov/water/what-were-doing/water-planning/quality-standards-impaired-waters-total-maximum-daily-loads/impaired-waters. Sites within 1000 feet of a OSRW, ONRW, or water impaired for sediment must operate as a no-discharge facility. These additional protections are borrowed from the USEPA 2021 draft Construction General Permit.

SLUDGE – DOMESTIC BIOSOLIDS:
Biosolids are solid materials resulting from domestic wastewater treatment meeting federal and state criteria for beneficial use (i.e. fertilizer). Sewage sludge is solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works; including, but not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in a treatment works.

✓ This permit does not authorize discharge or land application of biosolids. Sludge/biosolids is not generated by this industry.

SLUDGE – INDUSTRIAL:
Industrial sludge is solid, semi-solid, or liquid residue generated during the treatment of industrial process wastewater in a treatment works; including, but not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment process; scum and solids filtered from water supplies and backwashed; and a material derived from industrial sludge.

✓ Not applicable; sludge is not generated by this industry.

SPILL REPORTING:
Any emergency involving a hazardous substance must be reported to the Department's 24 hour Environmental Emergency Response hotline at (573) 634-2436 at the earliest practicable moment after discovery. The Department may require the submittal of a written report detailing measures taken to clean up a spill. These reporting requirements apply when the spill results in chemicals or materials leaving the permitted property or reaching waters of the state. This requirement is in addition to the noncompliance reporting requirement found in Standard Conditions Part I. https://dnr.mo.gov/waste-recycling/investigations-cleanups/environmental-emergency-response.

Underground and above ground storage devices for petroleum products, vegetable oils, and animal fats may be subject to control under federal Spill Prevention, Control, and Countermeasure Regulation and are expected to be managed under those provisions, if applicable. Substances regulated by federal law under the Resource Conservation and Recovery Act (RCRA) or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) which are transported, stored, or used for maintenance, cleaning or repair shall be managed according to the provisions of RCRA and CERCLA.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):
In accordance with 40 CFR 122.44(k), BMPs must be used to control or abate the discharge of pollutants when: 1) Authorized under section 304(e) of the CWA for the control of toxic pollutants and hazardous substances from ancillary industrial activities; 2) Authorized under section 402(p) of the CWA for the control of stormwater discharges; 3) Numeric effluent limitations are infeasible; or 4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA. In accordance with the EPA's *Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites,* (Document number EPA 833-R-06-004) published by the EPA in 2007 https://www.epa.gov/sites/production/files/2015-10/documents/sw_swppp_guide.pdf, BMPs are measures or practices used to reduce the amount of pollution entering waters of the state from a permitted facility. BMPs may take the form of a process, activity, or physical structure. Additionally, in accordance with the Stormwater Management, a SWPPP is a series of steps and activities to 1) identify sources of pollution or contamination, and 2) select and carry out actions which prevent or control the pollution of storm water discharges. Additional information can be found in *Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices* (EPA 832-R-92-006; September 1992).

A SWPPP must be prepared if the SIC code for the facility is found in 40 CFR 122.26(b)(14) and/or 10 CSR 20-6.200(2). A SWPPP may be required of other facilities where stormwater has been identified as necessitating better management.

The purpose of a SWPPP is to comply with all applicable stormwater regulations by creating an adaptive management plan to control and mitigate stream pollution from stormwater runoff. Developing a SWPPP provides opportunities to employ appropriate BMPs to minimize the risk of pollutants being discharged during storm events. The following paragraph outlines the general steps the permittee should take to determine which BMPs will work to achieve the benchmark values or limits in the permit. This section is not intended to be all encompassing or restrict the use of any physical BMP or operational and maintenance procedure assisting in pollution control. Additional steps or revisions to the SWPPP may be required to meet the requirements of the permit.

Areas which should be included in the SWPPP are identified in 40 CFR 122.26(b)(14). Once the potential sources of stormwater pollution have been identified, a plan should be formulated to best control the amount of pollutant being released and discharged by each activity or source. This should include, but is not limited to, minimizing exposure to stormwater, good housekeeping measures, proper facility and equipment maintenance, spill prevention and response, vehicle traffic control, and proper materials handling. Once a plan has been developed, the facility will employ the control measures determined to be adequate to prevent pollution from entering waters of the state. The facility will conduct inspections of the BMPs to ensure they are working properly and re-evaluate any BMP not achieving compliance with permitting requirements. For example if the BMP being employed is deficient in controlling stormwater pollution, corrective action should be taken to repair, improve, or replace the failing BMP. If failures do occur, continue this trial and error process until appropriate BMPs have been established.

The EPA has developed factsheets on the pollutants of concern for specific industries along with the BMPs to control and minimize stormwater (https://www.epa.gov/npdes/stormwater-discharges-industrial-activities). Along with EPA's factsheets, the International Stormwater BMP database (https://bmpdatabase.org/) may provide guidance on BMPs appropriate for specific industries.

For new, altered, or expanded stormwater discharges, the SWPPP shall identify reasonable and effective BMPs while accounting for environmental impacts of varying control methods. The antidegradation analysis must document why no discharge or no exposure options are not feasible. The selection and documentation of appropriate control measures shall serve as an alternative analysis of technology and fulfill the requirements of antidegradation [10 CSR 20-7.031(3)].

Alternative analysis evaluation of the BMPs is a structured evaluation of BMPs which are reasonable and cost effective. The alternative analysis evaluation should include practices designed to be: 1) non-degrading; 2) less degrading; or 3) degrading water quality. The glossary of the *Antidegradation Implementation Procedure* defines these three terms. The chosen BMP will be the most reasonable and effective management strategy while ensuring the highest statutory and regulatory requirements are achieved and the highest quality water attainable for the facility is discharged. The alternative analysis evaluation must demonstrate why "no discharge" or "no exposure" is not a feasible alternative at the facility. This structured analysis of BMPs serves as the antidegradation review, fulfilling the requirements of 10 CSR 20-7.031(3) Water Quality Standards and *Antidegradation Implementation Procedure*, Section II.B.

- ✓ Applicable: A SWPPP shall be developed and implemented for each site and shall incorporate required practices identified by the Department with jurisdiction, incorporate control practices specific to site conditions, and provide for maintenance and adherence to the plan.

UNDERGROUND INJECTION CONTROL (UIC):
The UIC program for all classes of wells in the State of Missouri is administered by the Missouri Department of Natural Resources and approved by EPA pursuant to section 1422 and 1425 of the Safe Drinking Water Act (SDWA) and 40 CFR 147 Subpart AA. Injection wells are classified based on the liquids which are being injected. Class I wells are hazardous waste wells which are banned by RSMo 577.155; Class II wells are established for oil and natural gas production; Class III wells are used to inject fluids to extract minerals; Class IV wells are also banned by Missouri in RSMo 577.155; Class V wells are shallow injection wells; some examples are heat pump wells and groundwater remediation wells. Domestic wastewater being disposed of sub-surface is also considered a Class V well.

In accordance with 40 CFR 144.82, construction, operation, maintenance, conversion, plugging, or closure of injection wells shall not cause movement of fluids containing any contaminant into Underground Sources of Drinking Water (USDW) if the presence of any contaminant may cause a violation of drinking water standards or groundwater standards under 10 CSR 20-7.031 or other health-based standards or may otherwise adversely affect human health. If the Department finds the injection activity may endanger USDWs, the Department may require closure of the injection wells or other actions listed in 40 CFR 144.12(c), (d), or (e). In accordance with 40 CFR 144.26, the permittee shall submit a Class V Well Inventory Form for each active or new underground injection well drilled, or when the status of a well changes, to the Missouri Department of Natural Resources, Geological Survey Program, P.O. Box 250, Rolla, Missouri 65402. Single family residential septic systems and non-residential septic systems used solely for sanitary waste and having the capacity to serve fewer than 20 persons a day are excluded from the UIC requirements (40 CFR 144.81(9)).

- ✓ Not applicable; this permit does not authorize subsurface wastewater systems or other underground injection. These activities must be assessed under an application for a site specific permit. Certain discharges of stormwater into sinkholes may qualify as UIC. It is important the permittee evaluate all stormwater basins, even those holding water; as sinkholes have varying seepage rates. This permit does not allow stormwater discharges into sinkholes. The facility must ensure sinkholes are avoided in the construction process. The State's online mapping resource https://modnr.maps.arcgis.com/apps/webappviewer/index.html?id=87ebef4af15d438ca658ce0b2bbc862e has a sinkhole layer.

VARIANCE:
Per the Missouri Clean Water Law Section 644.061.4, variances shall be granted for such period of time and under such terms and conditions as shall be specified by the commission in its order. The variance may be extended by affirmative action of the commission. In no event shall the variance be granted for a period of time greater than is reasonably necessary for complying with the Missouri Clean Water Law Section 644.006 to 644.141 or any standard, rule, or regulation promulgated pursuant to Missouri Clean Water Law Section 644.006 to 644.141.

- ✓ Not Applicable: This permit is not drafted under premises of a petition for variance.

WASTELOAD ALLOCATIONS (WLA) FOR LIMITATIONS:
Per 10 CSR 20-2.010(78), the amount of pollutant each discharger is allowed by the Department to release into a given stream after the Department has determined total amount of pollutant which may be discharged into the stream without endangering its water quality. Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's Technical Support Document For Water Quality-based Toxics Control (TSD) (EPA/505/2-90-001).

- ✓ Not applicable; water quality limitations were not applied in this permit.

WATER QUALITY STANDARDS:
Per 10 CSR 20-7.031(4), General Criteria shall be applicable to all waters of the state at all times, including mixing zones. Additionally, 40 CFR 122.44(d)(1) directs the Department to include in each NPDES permit conditions to achieve water quality established under Section 303 of the CWA, including state narrative criteria for water quality.

WHOLE EFFLUENT TOXICITY (WET) TEST:
Per 10 CSR 20-7.031(1)(FF), a toxicity test conducted under specified laboratory conditions on specific indicator organism; and per 40 CFR 122.2, the aggregate toxic effect of an effluent measured directly by a toxicity test. A WET test is a quantifiable method of determining if a discharge from a facility may be causing toxicity to aquatic life by itself, in combination with, or through synergistic responses when mixed with receiving water.

- ✓ Not applicable: At this time, permittees are not required to conduct a WET test. This permit is for stormwater only.

PART IV – EFFLUENT LIMITATIONS DETERMINATION

EPA Construction General Permit (CGP)
The CGP was used to research and support best professional judgment decisions made in establishing technology-based conditions for this general permit which are consistent with national standards. The permit writer determined the standards established by the CGP are achievable and consistent with federal regulations. Additionally, the conditions reflecting the best practicable technology currently available are utilized to implement the ELG.

In this general permit, technology-based effluent conditions are established through the SWPPP and BMP requirements. Effective BMPs should be designed on a site-specific basis. The implementation of inspections provides a tool for each facility to evaluate the effectiveness of BMPs to ensure protection of water quality. Any flow through an outfall is considered a discharge. Future permit action due to permit modification may contain new operating permit terms and conditions which supersede the terms and conditions, including effluent limitations, of this operating permit.

PART V–REPORTING REQUIREMENTS

SAMPLING:
The permittee is not required to sample stormwater under this permit. The Department may require sampling and reporting as a result of illegal discharges, compliance issues related to water quality concerns or BMP effectiveness, or evidence of off-site impacts from activities at the facility. If such an action is needed, the Department will specify in writing the sampling requirements, including such information as location and extent. If the permittee refuses to perform sampling when required, the Department may terminate the general permit and require the facility to obtain a site-specific permit with sampling requirements.

REPORTING:
There are quarterly reporting requirements for MO-R100xxx land disturbance permits. Project specific information is required to be report to the Department through the eDMR system.

PART VI – RAINFALL VALUES FOR MISSOURI & SURFACE WATER BUFFER ZONES

Knowledge of the 2-year, 24-hour storm event is used in this permit for two main reasons:
1) The design, installation, and maintenance of effective erosion and sediment controls to minimize the discharge of pollutants.
2) If the seven-day inspection frequency is utilized, an inspection must occur within 48 hours after any storm event equal to or greater than a 2-year, 24 hour storm has ceased.
For site-specific 2-year, 24-hour storm event information utilize the National Oceanic and Atmospheric Administration's National Weather Service Atlas 14 (NOAA Atlas 14) which is located at https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html. For more information visit; https://www.weather.gov/media/owp/oh/hdsc/docs/Atlas14_Volume8.pdf.

Surface Water Buffer Zones: In order to design controls that match the sediment removal efficiency of a 50-foot buffer, you first need to know what this efficiency is for your site. The sediment removal efficiencies of natural buffers vary according to a number of site-specific factors, including precipitation, soil type, land cover, slope length, width, steepness, and the types of erosion and sediment controls used to reduce the discharge of sediment prior to the buffer. For additional information; https://www.epa.gov/sites/default/files/2017-02/documents/2017_cgp_final_appendix_g_-_buffer_reqs_508.pdf

PART VII – ADMINISTRATIVE REQUIREMENTS

On the basis of preliminary staff review and applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the permit. The proposed determinations are tentative pending public comment.

PUBLIC MEETING:
The department hosted three public meetings for this permit. The meetings were held on January 27, February 17, and March 9, 2021.

PUBLIC NOTICE:
The Department shall give public notice when a draft permit has been prepared and its issuance is pending. Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest or because of water quality concerns related to a draft permit. No public notice is required when a request for a permit modification or termination is denied; however, the requester and facility must be notified of the denial in writing.

The Department must give public notice of a pending permit or of a new or reissued Missouri State Operating Permit. The public comment period is a length of time not less than thirty (30) days following the date of the public notice, during which interested persons may submit written comments about the proposed permit.

For persons wanting to submit comments regarding this proposed permit, please refer to the Public Notice page located at the front of this draft permit. The Public Notice page gives direction on how and where to submit appropriate comments.

- ✓ The Public Notice period for this permit is started March 25, 2022 and ended April 25, 2022. Two comment letters were received.

DATE OF FACT SHEET: 03/2/2022

COMPLETED BY:
SARAH WRIGHT
MS4 & LAND DISTURBANCE PERMITTING COORDINATOR
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION - STORMWATER AND CERTIFICATION UNIT
(573) 526-1139
Sarah.wright@dnr.mo.gov, dnr.generalpermits@dnr.mo.gov

SECTION 01580 – PROJECT SIGNS

PART 1 - GENERAL

1.01 SUMMARY

A. Contractor shall provide all material, labor and equipment necessary for the fabrication, printing and installation of Project signs.

B. This section covers project sign requirements for all Kansas City, Missouri - Water Services Department projects. Project sign requirements include the following:

1. Project identification sign description.
2. Project sign installation.
3. Maintenance and removal of Project sign.
4. Printing of signs.
5. Installation of signs.

1.02 SPECIFICATION MODIFICATIONS

A. It is understood that throughout this section these Specifications may be modified by appropriate items in Section 01015 – Specific Project Requirements or as otherwise indicated on the Drawings.

1.03 RELATED SECTIONS

A. Section 01015 – Specific Project Requirements.

B. Section 01300 – Submittals.

C. Section 01581 – Public Communications.

1.04 INFORMATION PROVIDED BY THE CITY

A. City shall provide the graphic design templates of the Project sign in an electronic format to be used in the printing process.

1.05 SUBMITTALS

A. Submit as specified in Section 01300 – Submittals.

B. Shop Drawings (not used).

C. Product Data (not used).

D. Samples.

E. Other:

1. Project Sign Locations – submit for review and approval a map of the Project area of marked up Drawings showing the location and orientation of each project sign.
2. Submit for review and approval notifications to homeowners and business adjacent to the location of the Project signs.
3. Re-use of Placards – if the Contractor has salvaged placards from previous projects, they may be re-used if approved by the City. Submit color photographs that accurately show the condition of each placard to be re-used for review and approval.
4. Notice of Removal – submit written notification to City that all Project signs have been removed.

PART 2 - PRODUCTS

2.01 PRINTERS

A. A list of printing companies that have previous experience with printing signs for the City are included in Section 01015 – Specific Project Requirements.

2.02 FRAME

A. Metal frame and hardware shall be in conformance with Water Services standard detail D-20142 – Installation Detail for Project Signs (see Figure 3).

2.03 PLACARDS

A. Upper Placard Size – 6 feet wide by 4 feet tall.
B. Lower Placard Size – 6 feet wide by 1 foot tall.
C. Material – Coroplast® corrugated plastic sheeting or approved equal.
D. Sheeting Thickness – ½ inch.
E. Sheeting Color – white.
F. Print Method – direct to Coroplast® with outdoor UV laminate coating.

2.04 PLACARD CONTENT

A. Construction Phase Upper Placard – for each Project sign the Contractor shall provide an upper placard which will be displayed through construction. An example of the Construction Phase Upper Placard is shown in Figure 1.
B. Post-Construction Phase Upper Placard – for each Project sign the Contractor shall provide an upper placard which will be displayed post construction. An example of the Construction Phase Upper Placard is shown in Figure 2.
C. Lower Placard – for each Project sign, the Contractor shall provide a lower placard. Examples of the Lower Placard are shown in Figures 1 and 2.
D. The City will provide digital files for all placards and graphic images.

2.05 NUMBER OF SIGNS TO BE PROVIDED

A. The number of project signs to be provided is defined in Section 01015 – Specific Project Requirements. Each Project sign includes the following:
    1. One (1) Construction Phase Upper Placard to be displayed during construction.
    2. One (1) Post-Construction Phase Upper Placard to be displayed after completion of the Work.
    3. One (1) Lower Placard to be displayed during construction and post-construction.
    4. Printing of placards.
B. Frame as shown in Water Services standard detail D-20142 – Installation Detail for Project Signs (see Figure 3).

PART 3 - EXECUTION

3.01 INSTALATION AND PLACEMENT OF SIGNS

A. Installation – Project signs shall be fabricated and installed in accordance with Water Services standard detail D-20142 – Installation Detail for Project Signs (see Figure 3).

B. Location – Project signs shall be located within the Site as defined by Section 00700 General Conditions. Project signs shall be erected in a conspicuous place but shall not interfere with the vision of pedestrian or vehicular traffic such as to create a hazard. Signs shall be located in the public right of way or in an easement acquired for the Project**.** Locations of the signs shall be coordinated with the City prior to installation and submitted accordance with paragraph 1.05 SUBMITTALS.
C. Notifications – the Contractor shall notify any homeowners or businesses adjacent to the location of the signs at least three (3) days prior to erecting signs.
D. Project sign(s) shall be erected not less than two (2) days before the start of construction activities. No construction activities are allowed until the Project signs are erected.
E. Project signs shall remain in place for the duration of the Project and shall be maintained in a true, plumb and neat condition.

3.02 REPLACEMENT OF UPPER PLACARDS

A. Upon completion of the Work and at the direction by the City, the Contactor shall remove the Construction Phase Upper Placard (Figure 1) on all Project signs and replace them with the Post-Construction Upper Placard (Figure 2).
B. The Lower Placards are to remain in place.

3.03 REMOVAL OF PROJECT SIGNS

A. All Project signs shall be maintained for thirty (30) calendar days after completion of the Work or as otherwise directed by the City.
B. Contractor shall remove all Project signs and restore the area disturbed by construction activities.
C. Project signs shall be removed from the Project areas and will become property of the Contractor.
D. The Contractor may dispose of Project signs or salvage and reuse them on future City projects. The City will assess the condition of the signs and determine the appropriateness of reuse.
E. Within three (3) days of the removal of signs, Contractor shall provide the City written notice that all Project signs have been removed from the Site.

Figure 1 – Example Construction Phase Upper Placard and Lower Placard

Figure 2 – Example Post-Construction Phase Upper Placard and Lower Placard

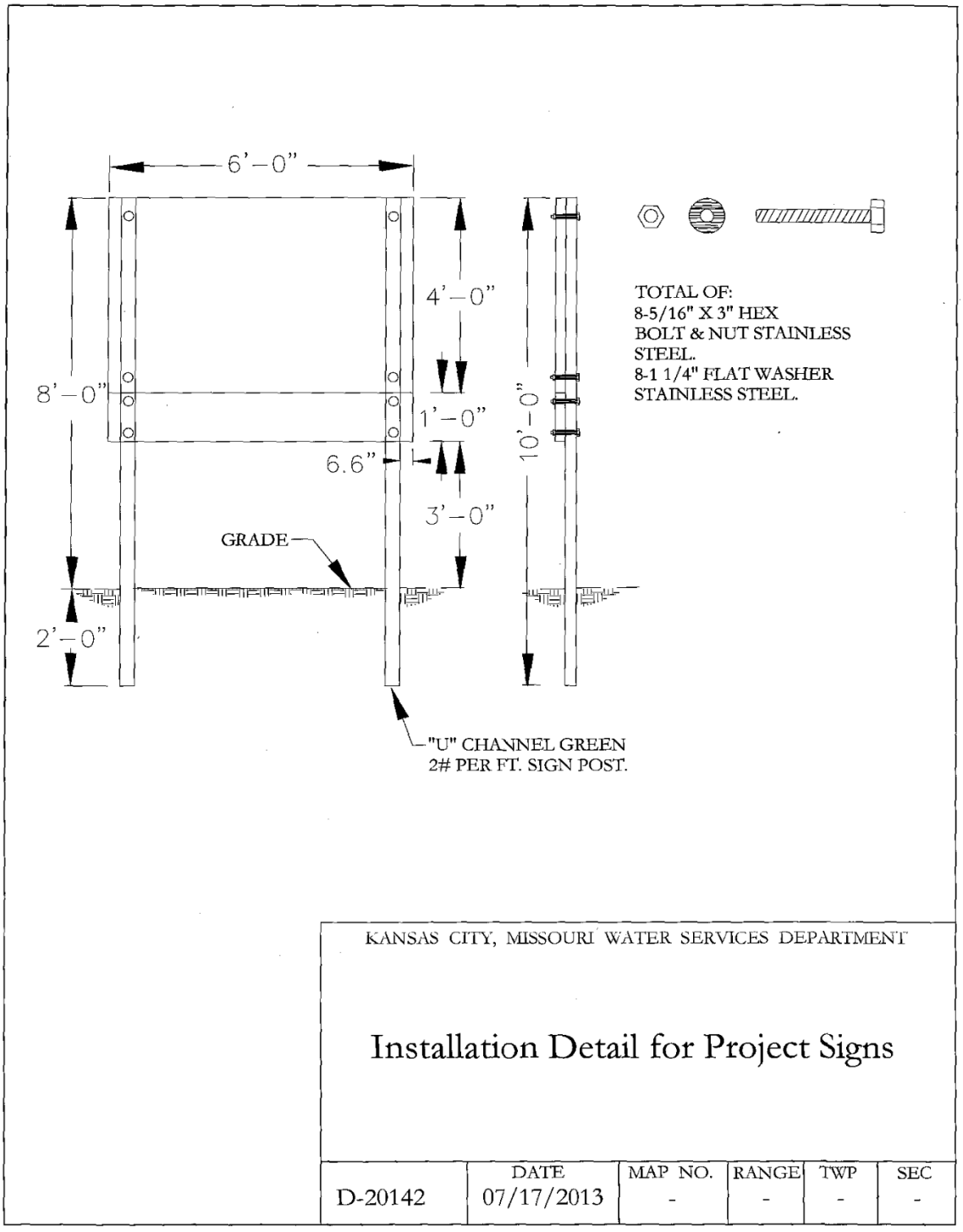


Figure 3 – Installation Detail for Project Signs

END OF SECTION

SECTION 01581 – PUBLIC COMMUNICATIONS

PART 1 - GENERAL

1.01 SUMMARY

A. This section covers communication procedures between the contractor and the public affected by construction activities.

B. Any time the contractor is acting on behalf of the City to perform work, the communications material between the contractor and the public shall adhere to these technical standards and is subject to review and approval by the City.

1.02 RELATED SECTIONS

A. Section 00700 – General Conditions:
   1. Article 6, paragraph 6.14 – Safety and Protection.

B. Section 01015 – Specific Project Requirements.

C. Section 01300 – Submittals.

1.03 DEFINITIONS

A. Affected Properties – homeowners, businesses, tenants or other entities whose everyday activities could be affected by the work.

1.04 INFORMATION PROVIDED BY THE CITY

A. The City will provide the contractor with an electronic file for mailing communications to affected property owners for the purpose of Project communications.

B. The City will provide the contractor with an electronic copy of approved communications templates to be distributed to affected properties.

1.05 SUBMITTALS

A. Submit as specified in Section 01300 – Submittals.

B. Notifications – Submit for review and approval all notification materials developed by the Contractor that are to be distributed to affected properties.

1.06 PUBLIC MEETINGS

A. Description – The contractor shall attend and participate in public meetings held for the project. The contractor's project manager shall attend and present project details. These details include, but are not limited to, the following:
   1. Project schedule.
   2. Project phasing.
   3. Disruptions to the neighborhood.
   4. Work hours.
   5. Temporary restoration efforts.
   6. Final restoration efforts.
   7. Field contact information.

B. The City will provide a location, date and time of the meeting and will facilitate the meeting.

C. See Section 01015 – Specific Project Requirements for additional meeting requirements.

1.07 DOOR HANGERS AND OTHER PRINTED COMMUNICATIONS

A. Description – Door hangers and other printed communications (fact sheets, post cards, signs, etc.) used throughout construction shall be distributed to inform homes and businesses of disruptions.

B. Templates – The City will provide templates for door hangers and other printed communications in an electronic format. See Figures 1 through 5 for an example door hanger.

C. Template Modification – The contractor may need to annotate the printed door hangers with project specific information. This effort may include describing the work and adding applicable date and time information for the benefit of the resident.

D. Review communications material – Review and approval of the communication materials by the City is required prior to the contractor's distribution of materials.

E. Printing and Reproduction – The contractor shall print door hangers, mailers and all other communication materials needed for the project.

F. Distribution List – The list of affected property owners will be provided by the City.

G. Mailing and Distribution – The contractor shall distribute the door hangers and other printed communications to the affected property owners. Door hangers are to be hand-delivered and not placed in the mailbox. All other printed communications will be delivered in a manner acceptable to the City.

H. Costs – All costs to develop, reproduce, deliver or mail notifications shall be included in the contractor's lump sum bid price.

1.08 NOTIFICATION OF UTILITIES

A. Notify utilities in accordance with Section 00700 – General Conditions, Article 6.

1.09 NOTICES TO PROPERTY OWNERS AND AUTHORITIES

A. As provided in Section 00700 - General Conditions, Article 6, the Contractor shall notify adjacent property owners and utilities when execution of the work may affect them.

B. Work Notice:
   1. General notice to affected property owners in advance of the work. Notice is required for any work within an easement. Notice shall be given for work within the City's right-of-way, outside of the street.
   2. Type of notification shall be a door hanger.

C. Denial of Access:
   1. Notice for when it is necessary to temporarily deny access to property, driveway, sidewalk or other facility.
   2. Type of notification shall be a door hanger.

D. Smoke Testing:
   1. Notice for when the Project involves smoke testing.
   2. Type of notification shall be a door hanger.

E. Utility Service Interruption:
   1. Notice for when any utility service connection must be interrupted.
   2. Type of notification shall be a door hanger.

F. Street Closures and Changes to Traffic Patterns:
   1. Notices to utilities and other concerned agencies prior to cutting or closing streets or other traffic areas or excavating near underground utilities or pole lines.
   2. Provide any additional notifications required by the traffic control permit.
   3. Type of notification will be written communication prepared and distributed by the Contractor.

G. Schedule – Notices shall be received by the affected properties no less than two (2) and no more than seven (7) calendar days prior to the work, denial of access, smoke testing, utility service interruption, street closures and changes to traffic patterns or other work that may require notification.

1.10 OTHER COMMUNICATIONS

A. See Section 01015 – Specific Project Requirements for additional communication requirements not specifically included herein or otherwise required by the Contract Documents.

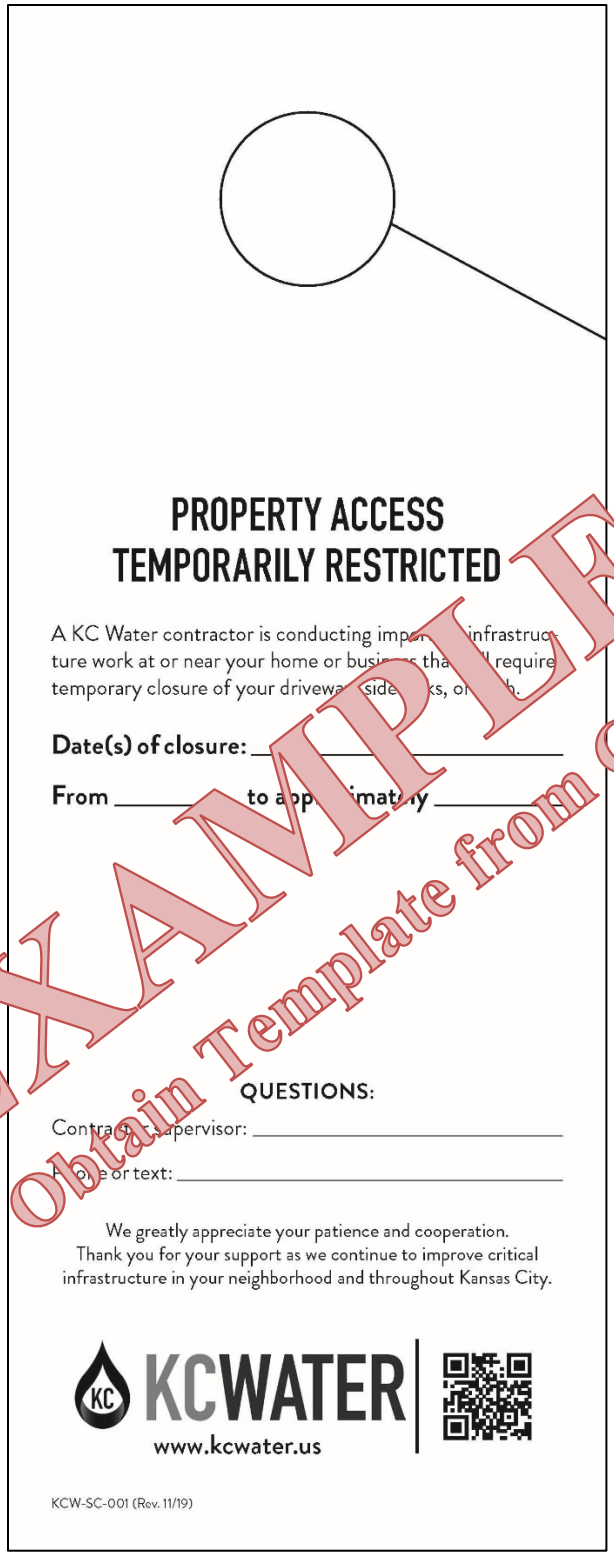
PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

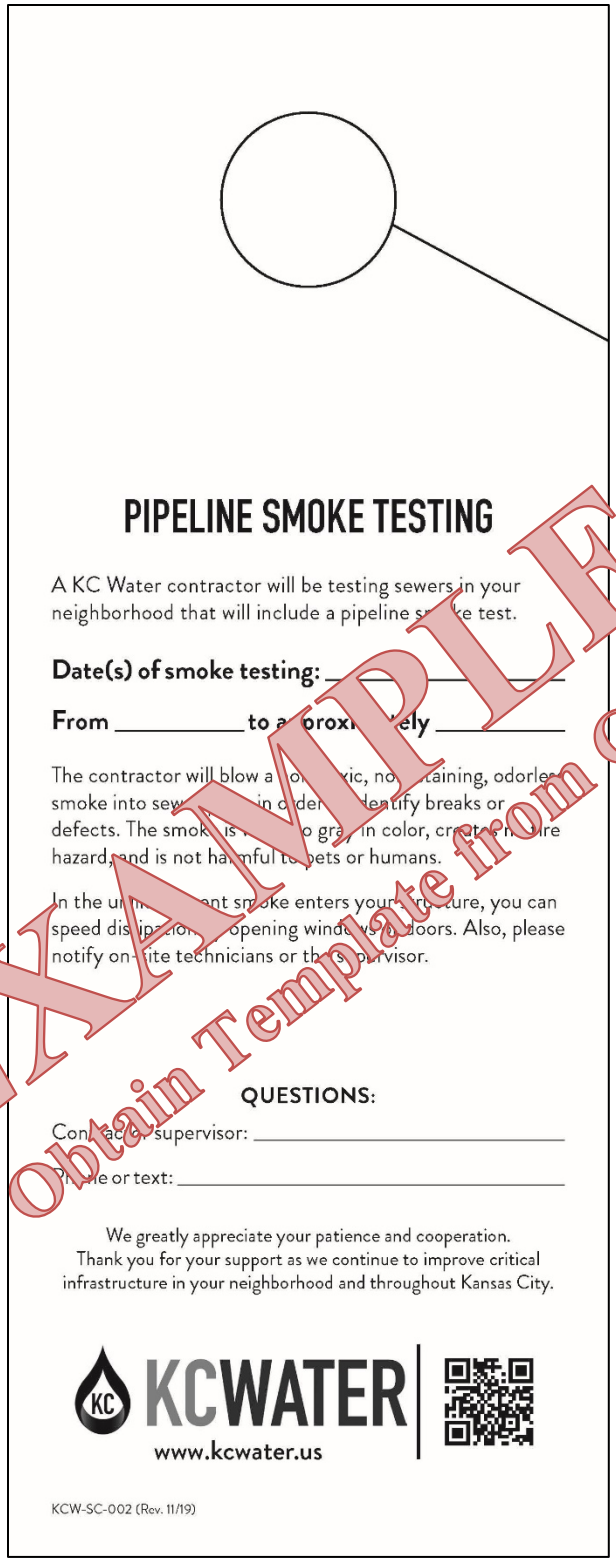
Not used.

See example templates on pages 4-9.



EXAMPLE
Obtain Template from City

Figure 1 – Restricted Access Door Hanger



PIPELINE SMOKE TESTING

A KC Water contractor will be testing sewers in your neighborhood that will include a pipeline s[illegible]e test.

Date(s) of smoke testing: _____

From _____ to a[illegible]ely _____

The contractor will blow a [illegible]ic, no[illegible]taining, odorless smoke into sew[illegible] in o[illegible]der [illegible]dentify breaks or defects. The smok[illegible] is [illegible]o gra[illegible] in color, cr[illegible]e[illegible]re hazard, and is not ha[illegible]mful t[illegible]pets or humans.

In the u[illegible]nt sm[illegible]oke enters your [illegible]ructure, you can speed dis[illegible]o[illegible] opening windows or doors. Also, please notify on-[illegible]ite technicians or th[illegible] supervisor.

QUESTIONS:

Con[illegible]ac[illegible] supervisor: _____

[illegible]e or text: _____

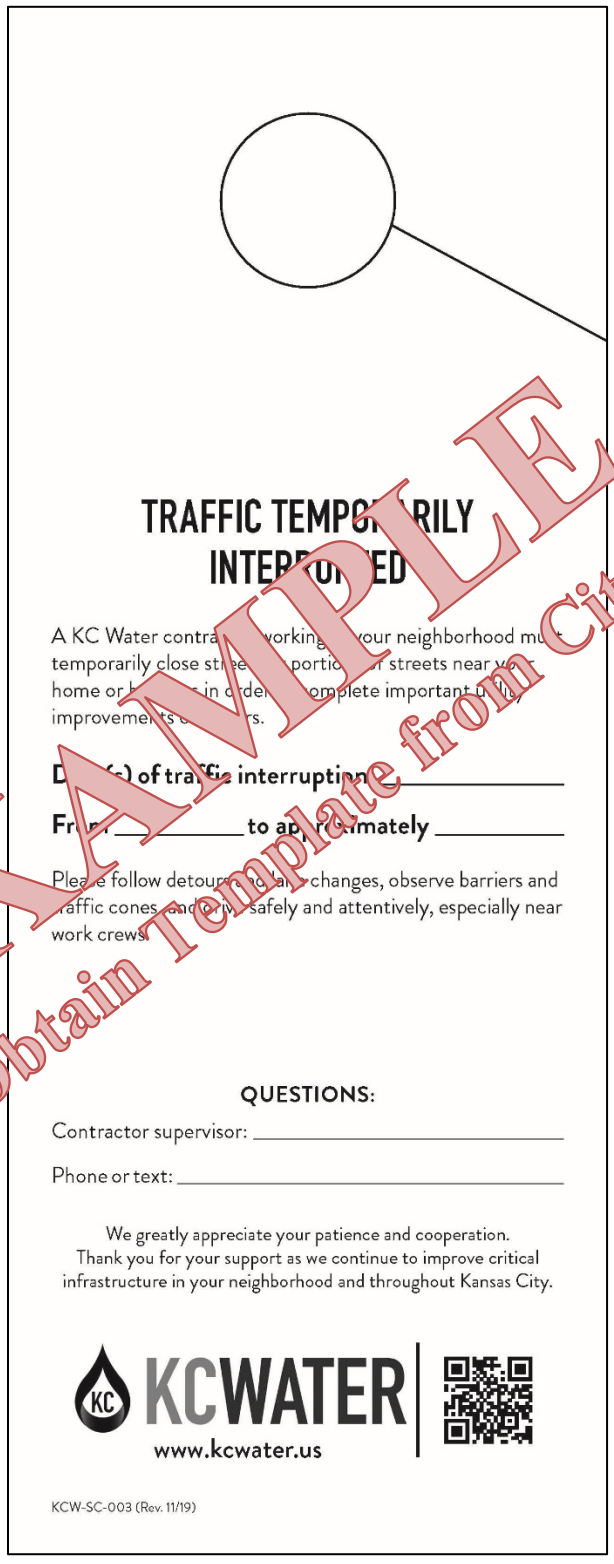
We greatly appreciate your patience and cooperation.
Thank you for your support as we continue to improve critical infrastructure in your neighborhood and throughout Kansas City.

KCWATER
www.kcwater.us

KCW-SC-002 (Rev. 11/19)

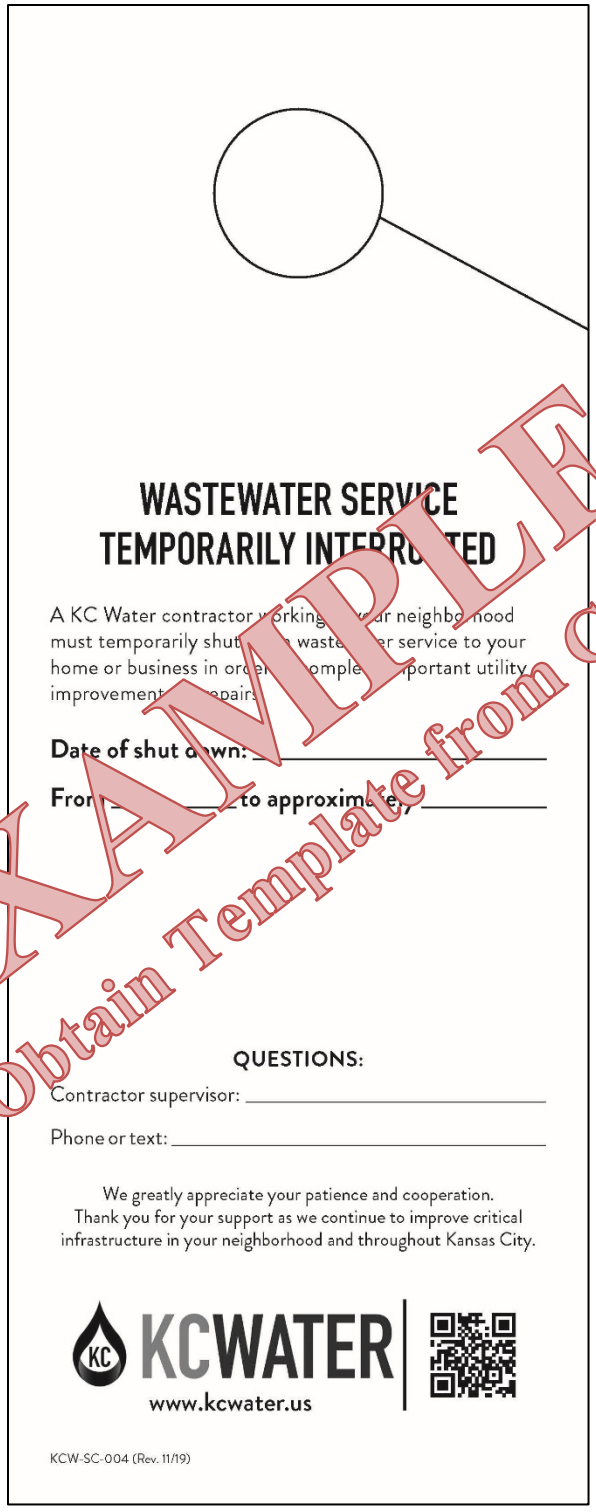
EXAMPLE
Obtain Template from City

Figure 2 – Smoke Testing Door Hanger



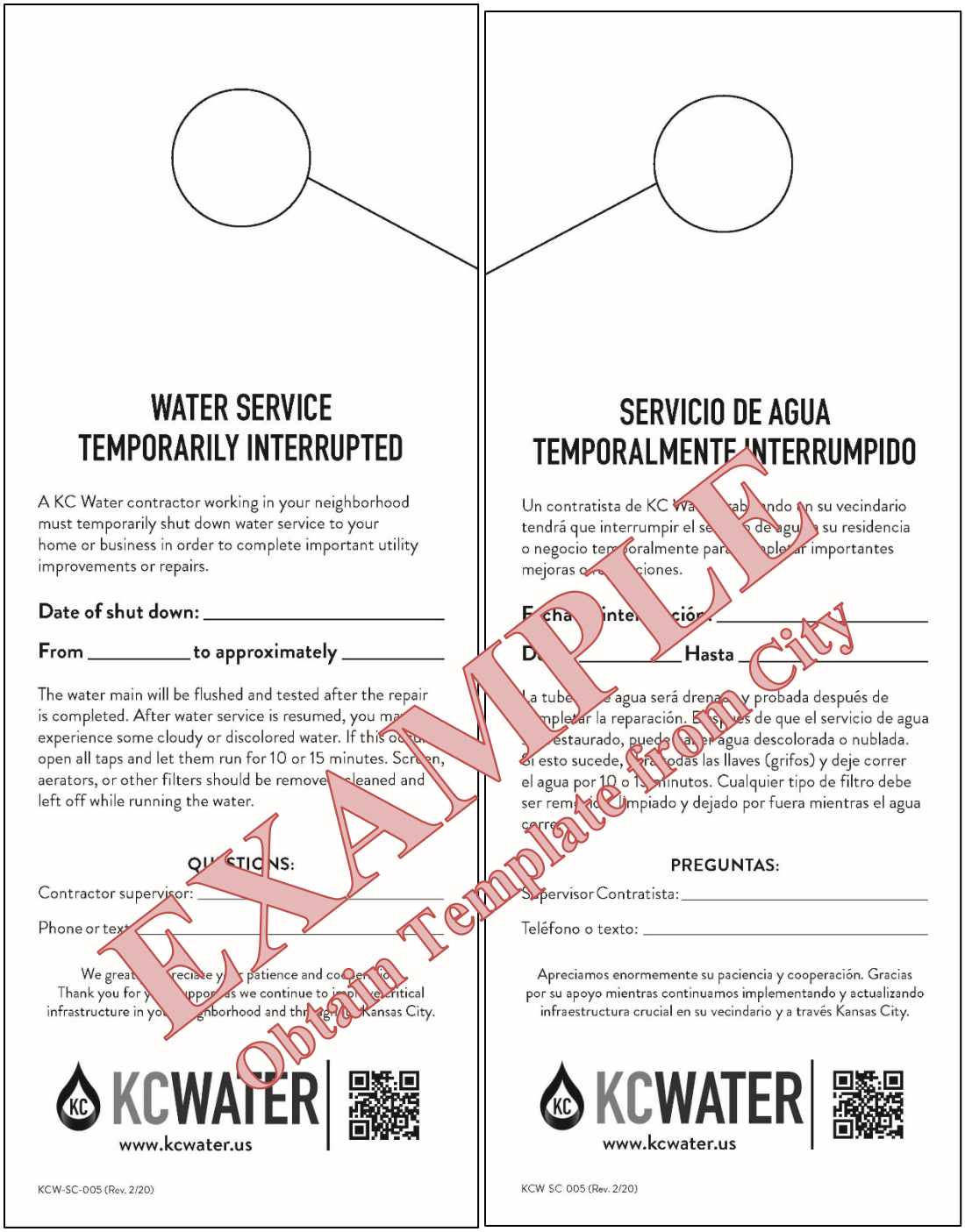
EXAMPLE
Obtain Template from City

Figure 3 -Traffic Interruption Door Hanger



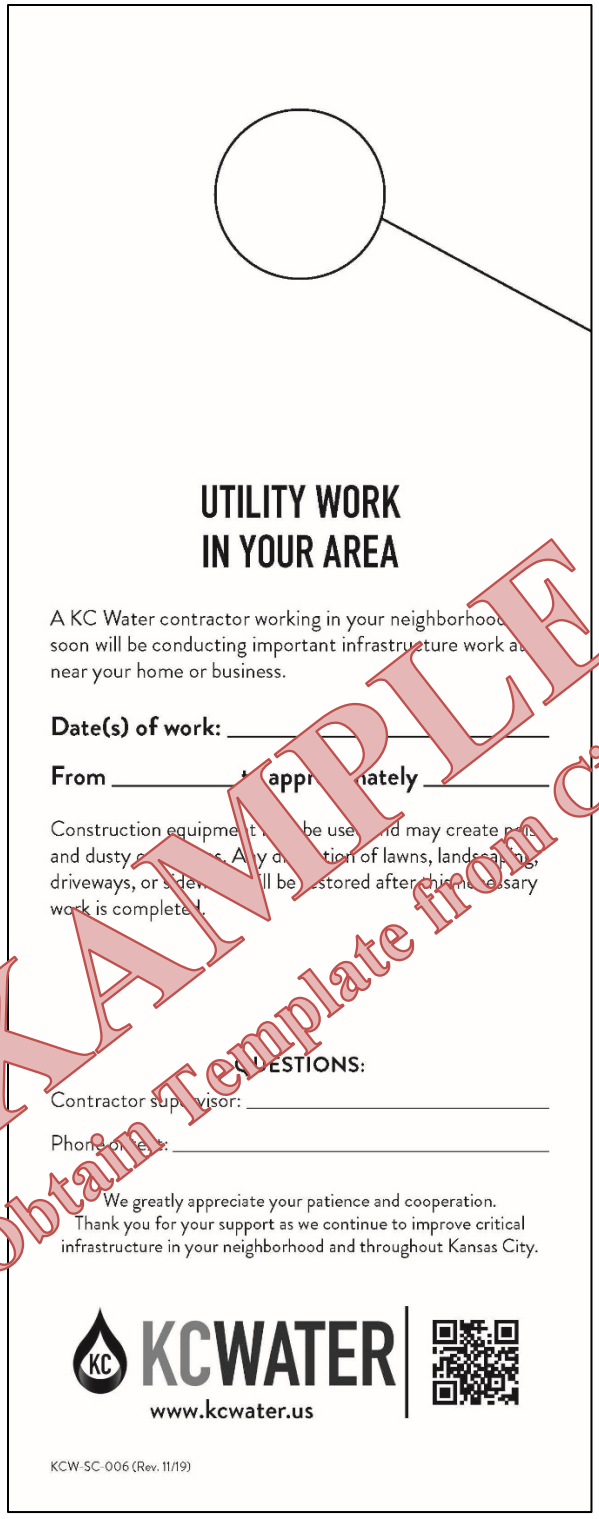
EXAMPLE
Obtain Template from City

Figure 4 – Wastewater Service Interruption Door Hanger



EXAMPLE
Obtain Template from city

Figure 5 – Water Service Interruption Door Hanger



EXAMPLE
Obtain Template from City

Figure 6 – Work Notice Door Hanger

END OF SECTION

SECTION 01600 – PRODUCT DELIVERY STORAGE AND HANDLING

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes: Product requirements; product selection; product options and substitutions; quality assurance; shipping, delivery, handling, and storage; and instructions for spare parts, maintenance products, and special tools.

1.02 REFERENCES

A. American National Standards Institute (ANSI).
B. NSF International (NSF):
    1. 61 - Drinking Water System Components - Health Effects.
    2. 372 - Drinking Water System Components – Lead Content.

1.03 RELATED SECTIONS

A. Section 01019 – Closeout Procedures.
B. Section 01300 – Submittals.
C. Section 01520 – Definitions and Acronyms
D. Section 01630 – Substitution Request Form.
E. Section 01757 – Commissioning.
F. Section 01810 – Project Design Criteria.
G. Section 09960 – High-Performance Coatings.

1.04 DEFINITIONS

A. Refer to Section 01420 – Definitions and Acronyms

1.05 SUBMITTALS

A. As specified in Section 01300 - Submittals.
B. Calculations/certifications in accordance with NSF 61 and 372 for materials in contact with drinking water.

1.06 GENERAL REQUIREMENTS

A. Comply with Specifications and referenced standards as minimum requirements.
B. Provide products by same manufacturer when products are of similar nature, unless otherwise specified.
C. Provide like parts of duplicate units that are interchangeable.
D. Provide equipment that has not been in service prior to delivery, except as required by tests.
E. When necessary, modify manufacturer's standard product to conform to specified requirements or requirements indicated on the Drawings.

1.07 SUBSTITUTIONS

A. Formal substitution request procedure:
    1. Submit a written formal substitution request to Engineer for each proposed substitution within 30 days of effective date of Contract.
    2. Engineer will return initial opinion and request for additional information within 30 days.

3. Engineer will notify Contractor in writing of decision to accept or reject the substitution request within 30 days of receiving required information.

B. Formal substitution request contents:
   1. Provide Substitution Request Form as specified in Section 01630 - Substitution Request Form.
   2. Manufacturer's literature including:
      a. Manufacturer's name and address.
      b. Product name.
      c. Product description.
      d. Reference standards.
      e. Certified performance and test data.
      f. Operation and maintenance data.
   3. Samples, if applicable.
   4. Shop drawings, if applicable.
   5. Reference projects where the product has been successfully used:
      a. Name and address of project.
      b. Year of installation.
      c. Year placed in operation.
      d. Name of product installed.
      e. Point of contact: Name and phone number.
   6. Itemized comparison of the proposed substitution with product specified including a list of significant variations:
      a. Design features.
      b. Design dimensions.
      c. Installation requirements.
      d. Operations and maintenance requirements.
   7. Define impacts:
      a. Impacts to construction schedule.
      b. Impacts to other contracts.
      c. Impacts to other work or products.
      d. Impact to Contract Sum:
         (1) Do not include costs under separate contracts.
         (2) Do not include Engineer's costs for redesign or revision of Contract Documents.
         (3) Required license fees or royalties.
      e. Availability of maintenance services and sources of replacement materials.
   8. Contractor represents the following:
      a. Contractor shall pay associated costs for the Engineer to evaluate the substitution.
      b. Contractor bears the burden of proof of the equivalency of the proposed substitution.
      c. Proposed substitution does not change the design intent and will have equal performance to the specified product.
      d. Proposed substitution is equal or superior to the specified product.
      e. Contractor will provide the warranties or bonds that would be provided on the specified product on the proposed substitution, unless Owner requires a Special Warranty.
      f. Contractor will coordinate installation of accepted substitution into the Work and will be responsible for the costs to make changes as required to the Work.

g. Contractor waives rights to claim additional costs caused by proposed substitution which may subsequently become apparent.

C. Substitutions will not be considered for acceptance under the following conditions:
   1. No formal substitution request is made.
   2. The substitution is simply implied or indicated on shop drawings or product data submittals.
   3. The formal substitution request is submitted by a subcontractor or supplier.

D. Substitution requests submitted after the deadline will not be considered unless the following evidence is submitted to the Engineer:
   1. Proof that the specified product is unavailable for reasons beyond the control of the Contractor.
      a. Reasons may include manufacturing discontinued, bankruptcy, labor strikes, or acts of God.
      b. Contractor placed or attempted to place orders for the specified products within 10 days after the effective date of the Agreement.
      c. The formal substitution request is submitted to Engineer within 10 days of the Contractor discovering the specified product cannot be obtained.

E. Engineer's decision on a substitution requests will be final and binding.
   1. Approved substitutions will be incorporated into the Contract Documents with a Change Order.
   2. Requests for time extensions and additional costs based on submission of, approval of, or rejection of substitutions will not be allowed.

PART 2 – PRODUCTS

2.01 GENERAL

A. Material requirements:
   1. Materials: Provide corrosion resistance suitable for project conditions as specified in Section 01810 - Project Design Criteria.
   2. Dissimilar metals: Separate contacting surfaces with dielectric material.

B. Edge grinding:
   1. Sharp projections of cut or sheared edges of ferrous metals which are not to be welded shall be ground to a radius required to ensure satisfactory paint adherence.

2.02 PRODUCTS IN CONTACT WITH DRINKING WATER

A. Materials in contact with drinking waters: In accordance with NSF 61 and NSF 372.
   1. Certification by an independent ANSI accredited third party, including, but not limited to, NSF International, as being lead free.

2.03 PRODUCT SELECTION

A. When products are specified by standard or specification designations of technical societies, organizations, or associations only, provide products that meet or exceed reference standard and Specifications.

B. When products are specified with names of manufacturers but no model numbers or catalog designations, provide:
   1. Products by one of named manufacturers that meet or exceed Specifications.

2. Engineer deemed "or equal" evidenced by an approved shop drawing or other written communication.

C. When products are specified with names of manufacturers and model numbers or catalog designations, provide:
    1. Products with model numbers or catalog designations by one of named manufacturers.
    2. Engineer deemed "or equal" evidenced by an approved shop drawing or other written communication.

D. When products are specified with names of manufacturers, but with brand or trade names, model numbers, or catalog designations by one manufacturer only, provide:
    1. Products specified by brand or trade name, model number, or catalog designation.
    2. Products by one of named manufacturers proven, in accordance with requirements for an "or equal", to meet or exceed quality, appearance and performance of specified brand or trade name, model number, or catalog designation.
    3. Engineer deemed "or equal" evidenced by an approved shop drawing or other written communication.

E. When Products are specified with only one manufacturer followed by "or Equal," provide:
    1. Products meeting or exceeding Specifications by specified manufacturer.
    2. Engineer deemed "or equal" evidenced by an approved shop drawing or other written communication.

2.04 SHIPMENT

A. Mandatory requirements prior to shipment of equipment:
    1. Engineer approved shop drawings.
    2. Engineer approved Manufacturer’s Certificate of Source Testing as specified in Section 01757 - Commissioning, when required by specifications.
    3. Draft operations and maintenance manuals, when required by specifications.

B. Prepare products for shipment by:
    1. Tagging or marking products to agree with delivery schedule or shop drawings.
    2. Including complete packing lists and bills of material with each shipment.
    3. Packaging products to facilitate handling and protection against damage during transit, handling, and storage.
    4. Securely attach special instructions for proper field handling, storage, and installation to each piece of equipment before packaging and shipment.

C. Transport products by methods that avoid product damage.

D. Deliver products in undamaged condition in manufacturer's unopened containers or packaging.

2.05 SPARE PARTS, MAINTENANCE PRODUCTS, AND SPECIAL TOOLS

A. Provide spare parts and maintenance products as required by Specifications.

B. Provide one set of special tools required to install or service the equipment.

C. Box, tag, and clearly mark items.

D. Contractor is responsible for spare parts, maintenance products, and special tools until acceptance by Owner.

E. Store spare parts, maintenance products, and special tools in enclosed, weatherproof, and lighted facility during the construction period.
    1. Protect parts subject to deterioration, such as ferrous metal items and electrical components with appropriate lubricants, desiccants, or hermetic sealing.

F. Provide spare parts and special tools inventory list, see Appendix A:

1. Equipment tag number.
2. Equipment manufacturer.
3. Subassembly component, if appropriate.
4. Quantity.
5. Storage location.

G. Store large items individually:
    1. Weight: Greater than 50 pounds.
    2. Size: Greater than 24 inches wide by 18 inches high by 36 inches long.
    3. Clearly labeled:
        a. Equipment tag number.
        b. Equipment manufacturer.
        c. Subassembly component, if appropriate.

H. Store in spare parts box smaller items:
    1. Weight: Less than 50 pounds.
    2. Size: Less than 24 inches wide by 18 inches high by 36 inches long.
    3. Clearly labeled:
        a. Equipment tag number.
        b. Equipment manufacturer.
        c. Subassembly component, if appropriate.

I. Spare parts and special tools box:
    1. Wooden box:
        a. Size: 24 inches wide by 18 inches high by 36 inches long.
    2. Hinged wooden cover:
        a. Strap type hinges.
        b. Locking hasp.
        c. Spare parts inventory list taped to underside of cover.
    3. Coating: As specified in Section 09960 - High-Performance Coatings.
    4. Clearly labeled:
        a. The words “Spare Parts and/or Special Tools”.
        b. Equipment tag number.
        c. Equipment manufacturer.

PART 3 – EXECUTION

3.01 DELIVERY AND HANDLING

A. Handle equipment in accordance with manufacturer's instructions.
B. Provide equipment and personnel to handle products by methods to prevent soiling or damage.
C. Upon delivery, promptly inspect shipments:
    1. Verify compliance with Contract Documents, correct quantities, and undamaged condition of products.
    2. Acceptance of shipment does not constitute final acceptance of equipment.

3.02 STORAGE AND PROTECTION

A. Immediately store and protect products and materials until installed in Work.
B. Store products with seals and legible labels intact.
C. Maintain products within temperature and humidity ranges required or recommended by manufacturer.

D. Protect painted surfaces against impact, abrasion, discoloration, and other damage.
    1. Repaint damaged painted surfaces.
E. Exterior storage of fabricated products:
    1. Place on aboveground supports that allow for drainage.
    2. Cover products subject to deterioration with impervious sheet covering.
    3. Provide ventilation to prevent condensation under covering.
F. Store moisture sensitive products in watertight enclosures.
G. Furnish covered, weather-protected storage structures providing a clean, dry, noncorrosive environment for mechanical equipment, valves, architectural items, electrical and instrumentation equipment and special equipment to be incorporated into this project.
    1. Storage of equipment shall be in strict accordance with the “instructions for storage” of each equipment supplier and manufacturer including connection of heaters, placing of storage lubricants in equipment, etc.
    2. The Contractor shall furnish a copy of the manufacturer’s instructions for storage to the Engineer prior to storage of all equipment and materials.
    3. Pumps, motors, electrical equipment, and all equipment with antifriction or sleeve bearings shall be stored in weathertight structures maintained at a temperature above 60°F. Electrical equipment, controls, and insulation shall be protected against moisture and water damage. All space heaters furnished in equipment shall be connected and operated continuously.
H. Unless otherwise instructed by or required by the equipment manufacturer:
    1. Equipment having moving parts, such as gears, bearings, and seals, shall be stored fully lubricated with oil, grease, etc.
    2. Equipment having moving parts shall be rotated a minimum of twice a month to ensure proper lubrication and to avoid metal to metal "welding".
I. Store loose granular materials on solid surfaces in well-drained area.
    1. Prevent materials mixing with foreign matter.
    2. Provide access for inspection.
J. Payment will not be made for equipment and materials improperly stored or stored without providing Engineer with the manufacturer's instructions for storage.
K. Provide an Equipment Log including, as a minimum, the equipment identification, date stored, date of inspection/maintenance, date removed from storage, copy of manufacturer’s recommended storage guidelines, description of inspection/maintenance activities performed, and signature of party performing inspection/maintenance.

3.03 PROTECTION AFTER INSTALLATION

A. Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations.
    1. Remove covering when no longer needed.
    2. Replace corroded, damaged, or deteriorated equipment and parts before acceptance of the project.
B. Update Equipment Log on a monthly basis with description of maintenance activities performed in accordance with the manufacturer’s recommendation and industry standards and signature of party performing maintenance.
C. Upon installation of the equipment, Contractor shall, at the discretion of Engineer, start the equipment at one-half load for an adequate period of time to ensure that the equipment does not deteriorate from lack of use.

D. Unless otherwise instructed by or required by the equipment manufacturer, lubricants shall be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. New lubricants shall be put into the equipment by Contractor at the time of acceptance.

3.04 QUALITY ASSURANCE

A. Employ entities that meet or exceed specified qualifications to execute the Work.
B. Verify project conditions are satisfactory before executing subsequent portions of the Work.

3.05 COMMISSIONING

A. As specified in Section 01757 - Commissioning.

3.06 CLOSEOUT ACTIVITIES

A. Owner may request advanced delivery of spare parts, maintenance products, and special tools.
    1. Deduct the delivered items from the inventory list and provide transmittal documentation.
B. Immediately prior to the date of Substantial Completion, arrange to deliver spare parts, maintenance products, and special tools to Owner at a location on site chosen by the Owner.
    1. Provide itemized list of spare parts and special tools that matches the identification tag attached to each item.
    2. Owner and Engineer will review the inventory and the itemized list to confirm it is complete and in good condition prior to signing for acceptance.

3.07 ATTACHMENTS

A. Appendix A - Spare Parts, Maintenance Products, and Special Tools Inventory List.

END OF SECTION

SECTION 01615 – EQUIPMENT IDENTIFICATION AND TAGGING

PART 1 - GENERAL

A. The following is a guide to the various types of tags used for KC Water (Wastewater Division) asset identification.

1.01 SUMMARY

B. This section describes tag structures KC Water uses to label an asset for different purposes. These tags include:
    1. CMMS tags (Asset IDs)
        a. These tags are used to identify assets in CITY's CMMS (Computerized Maintenance Management System.
        b. CMMS is primarily used for maintenance scheduling and financial tracking of assets.
        c. Not every asset will need an Asset ID, reference CITY's Tag Generator Spreadsheet for more details about which assets need this type of tag.
            (1) CMMS tags for all new assets will be created using the CITY's Tag Generator Spreadsheet.

    2. PLC Shortcuts
        a. Shortcuts are used in the OIT (Operator Interface Terminal)/HMI (Human Machine Interface) to establish a path from the HMI to the PLC.
        b. These tags are only used to identify/label PLCs.
        c. See CITY SCADA Standards for more details.

    3. P&ID Tags
        a. These tags are used to identify equipment and instruments on P&IDs (Process and Instrumentation Drawings).
        b. These tags are composed of a 3-5 digit equipment or instrument code followed by a 5 digit loop number.
        c. See CITY P&ID tagging standards for more details.

    4. PlantPax Tags
        a. PlantPax Tags are used in the PLC program as object names for all standard PlantPax objects.
        b. The tagging convention for these tags is based on ANSI/ISA Table 4.1 and also utilizes the loop numbers from the P&ID's
        c. See SCADA Standards for more details.

    5. NonPlantPax Tags
        a. NonPlantPax tags are used for objects that are not in the standard PlantPax library of objects. This might include objects that a vendor has created or possibly objects that a local integrator might need to create for specialty equipment that doesn't already have an object type in the standard PlantPax library.

    6. Other Tags/Names (See SCADA Standards for details)

a. HMI Application/Display Names.
b. OIT Application Names.
c. Thin/Thick Client Names.
d. ControlLogix PLC Program Filenames.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

SUBSTITUTION REQUEST

Project Number _____

Project Title _____

To: _____ Authorization Number: _____
_____ From: _____
Re: _____ Date: _____
_____ Contract For: _____

Specification Title: _____
Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____
Manufacturer: _____ Address: _____ Phone No. _____
Trade Name: _____ Model No. _____
Installer: _____ Address: _____ Phone No. _____
History: ❑ New Product ❑ 2-5 years old ❑ 5-10 years old ❑ More than 10 years old
Differences between proposed substitution and specified product: _____
_____
_____

❑ Point-by-point comparative data attached – REQUIRED

Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance, service, and availability of replacement parts, as applicable, are available.
- Proposed substitution will not affect or delay Progress Schedule, except as stated below.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances, except as stated below.
- Payment will be made for changes to building design, including architectural or engineering design, detailing, licenses, royalties, and construction costs caused by the requested substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be completed in all respects.

Reason for not providing specified item: _____
_____
_____
_____

Similar Installation:
Project: _____ Design Professional: _____
Address: _____ Owner: _____
_____ Date Installed: _____
Proposed substitution affects other parts of Work: ❑ No ❑ Yes; explain _____
_____
_____

Savings to Owner for accepting substitution: _____
Proposed substitution changes Contract Time: ❑ No ❑ Yes; add/deduct _____ days.

Supporting Data Attached:
❑ Product Data ❑ Drawings ❑ Tests ❑ Reports ❑ Samples ❑ _____
Attachments: _____

Submitted by: _____
Signature: _____
Firm: _____
Address: _____

Telephone: _____ Fax: _____ E-Mail: _____

Additional Comments: ❑ Contractor ❑ Subcontractor ❑ Supplier ❑ Manufacturer ❑ DP ❑ _____

DESIGN PROFESSIONAL'S REVIEW AND ACTION

- ❑ Substitution approved – Make submittals in accordance with Specification Section 01300.
- ❑ Substitution approved as noted – Make submittals in accordance with Specification Section 01300.
- ❑ Substitution rejected – Use specified materials.
- ❑ Substitution Request received too late – Use specified materials.

Signed by: _____ Date: _____

Distribution:
- ❑ Owner
- ❑ Design Professional
- ❑ Contractor
- ❑ Consultant
- ❑ Construction Manager
- ❑ Other

SECTION 01664 - TRAINING

PART 1 – GENERAL

1.01 DESCRIPTION

A. This section contains requirements for training the Owner's personnel by the Manufacturer's Representative in the proper operation and maintenance of the equipment and systems installed under this contract and other training required to operate the Works.
B. Training outcomes: Owner's operations, maintenance, and engineering staff have the information needed to safely operate, maintain, and repair the equipment/systems provided in the Contract Documents.

1.02 RELATED SECTIONS

A. Section 01300 – Submittals.
B. Section 01757 – Commissioning.

1.03 QUALITY ASSURANCE

A. Where indicated in the Equipment Schedule and as required by the detailed specifications, the Manufacturer's Representative shall provide on-the-job training of the Owner's personnel. The training sessions shall be conducted by qualified, experienced, factory trained representatives of the various equipment manufacturers familiar with operation and maintenance manual information. Commissioning Manager may perform other training sessions as approved by the Owner's Representative.
B. Trainers shall be knowledgeable in the equipment/system for which they are training. Trainer's qualifications shall be submitted in a form provided by the Owner and specifically demonstrating operational knowledge of the specific systems and components and treatment facility classroom and field training experience.

1.04 SUBMITTALS

A. The following information shall be submitted to the Engineer and Owner in accordance with the provisions of the Submittal Procedures section (Section 01300).
B. Lesson plans for each training session to be conducted by the manufacturer's representatives. Lessons plans shall be submitted 45 days prior to the scheduled training. In addition, training manuals, handouts, visual aids, and other reference materials shall be included.
C. Subject of each training session, instructor (s) and qualifications of individuals conducting the training, and tentative date and time of each training session. Owner has the right to request instructor substitution that are not appropriately qualified.
D. Training schedule including respective manufacturer, estimated dates for installation completion and estimated training dates will be incorporated into the project schedule in the commissioning section consistent with direction provided by the Owner's affected facility or division.
E. Submit other audio-visual aids utilized during each training course.
F. Provide two electronic copies and 3 hard copies organized in notebooks of the training course material 7 days prior to training.

PART 2 – PRODUCTS

2.01 GENERAL

A. Where specified, the Contractor's Commissioning Manager shall conduct training sessions for the Owner's personnel to instruct staff on the proper operation, care, and maintenance of the equipment and systems installed under this contract.
B. Training shall take place at the site of the work and under the conditions specified in the following paragraphs. Approved operation and maintenance manuals shall be available at least 30 days prior to the date schedule for the individual training session. Furnish a copy of each complete training package, to include operation and maintenance data for distribution to each trainee.
C. Commissioning Manager shall meet with Engineer and Owner's designated training Manager to develop a list of personnel to be trained and to establish expected training outcomes and objectives 120 days prior to commissioning of equipment/system and schedule the training.
D. Commissioning Manager shall conduct commissioning progress meetings throughout construction to plan, scope, coordinate, schedule future activities and resolve issues at least monthly. This meeting may be part of the weekly progress meetings.

2.02 LOCATION

A. Training sessions shall take place at the site of the work or at the Water Services Department offices as determined by the Owner.

2.03 LESSON PLANS

A. Lesson plans shall contain an outline of the material to be presented along with a description of the visual aids to be utilized during the sessions. Each plan shall contain time allocation for each subject and time spent on each form of training.
B. Lesson plans shall contain the following minimum information:
    1. Title and objectives
    2. Recommended attendees (i.e. managers, engineers, operators, maintenance)
    3. Course description, outline of course content, and estimated class duration.
    4. Format (i.e. lecture, self-study, demonstration, hands-on)
    5. Instruction materials and equipment requirements.
    6. Resumes of instructors providing training.
    7. Provide performance-based learning objectives.
    8. State learning objectives in terms of what the trainees will be able to do at the end of the lesson.
    9. Define student conditions of performance and criteria utilizing learning objectives for evaluating instructional success.
    10. Provide necessary information for submission to MDNR for approval of training hours in compliance with certified operator regulations for certificate renewal.
    11. Correspondence that a submission to MDNR for training hours has been completed and approved.
    12. Provide maintenance instruction lessons plans to include mechanical, HVAC, instrumentation, and electrical aspects.
    13. Equipment operation:
        a. Describe equipment process function and system theory.
        b. Describe equipment fundamental operating principles and dynamics.
        c. Identify equipment mechanical, electrical, and electronic components and features.
        d. Identify support equipment associated with the operation of subject equipment.

e. Detail the relationship of each piece of equipment or component to the subsystems, systems, and process.
f. Cite hazards associated with the operations, exposure to chemicals associated with the component, or the waste stream handled by the component.
g. Specify appropriate safety precautions, equipment, and procedures to eliminate, reduce, or overcome hazards.

14. Detailed component description:
    a. Define preventative maintenance (PM) inspection procedures required on equipment in operation and identify troubleshooting and potential issues as a result of the troubleshooting,
    b. Identify predictive maintenance PdM that may be applicable (infrared analyses, oil evaluation, vibration analyses) to the component or system.
    c. Identify preventive maintenance tasks and frequencies and provide in a table.
    d. Identify each component function and describe in detail.
    e. Where applicable, group relative components into subsystems.
    f. Identify and describe in detail equipment safety features, permissives and controls interlocks.
15. Define and provide training on recommended systematic troubleshooting procedures as they relate to specific craft problems and provide component specific troubleshooting checklists as they relate to specific craft problems.
16. One complete set of originals of the lesson plans, training manuals, handouts, visual aids and reference materials shall be the property of the Owner and shall be suitable bound for proper organization and easy reproduction. The Contractor shall furnish up to forty (40) copies of necessary training manuals, handouts, visual aids, and reference materials at least one week prior to each training session. Specific quantities will be identified during progress or other meetings.

2.04 FORMAT AND CONTENT

A. Each training session shall be comprised of time spent both in the classroom and at the specific location of the subject equipment or system.
B. Instructors shall apply adult education best practices, emphasizing learner participation and activity.
C. Training delivery may include problem solving, question/answer, hands-on instruction, practice, evaluation/feedback tools, and lecture.
D. Visual aids must support training objectives.
E. Delivery time should be less than 30 percent of class time.
F. Delivery time is a minimum of 1 hours and a maximum of 2 hours.
G. Longer training sessions requires Owner approval.
H. Refreshment and breaks within the Owner's customary schedule or as predetermined in advance of the training delivery.
I. Estimated maximum class size will vary for class and field training sessions. This will be determined in advanced. Commissioning Manager and Owner will develop a headcount one (1) week prior to the class so the instructor can provide the correct number of aids and know the correct number of repeated sessions.
J. Training Modules:
    1. Provide a training module for each equipment category.
    2. Divide each training module's instructional content into discrete lesson plans with a division between operations and maintenance training if directed by the Owner's Representative.

K. Training Aids:
    1. Instructors are to utilize P&ID's and are encouraged to use audio-visual devices, models, charts, etc. to increase the transfer of knowledge.
    2. Instructors shall provide such equipment (televisions, video recorder/player, computer, projectors, screens, easels, etc.), models, charts, etc. for each class.
    3. Instructor is responsible for confirming with Engineer and Owner in advance of each class that the classroom will be appropriate for the types of audiovisual equipment to be utilized.
L. Familiarization:
    1. Review catalog, parts lists, drawings, etc. which have been previously provided for the plan files and operation and maintenance manuals.
    2. Check out the installation of the specific equipment items.
    3. Demonstrate the unit and indicate how all parts of the specifications are met.
    4. Answer questions.
M. Safety:
    1. Using material previously provided, review safety references.
    2. Discuss proper precautions around equipment.
N. Operation:
    1. Using material previously provided, review reference literature.
    2. Explain all models of operation (including emergency).
    3. Check out Owner's personnel on proper use of the equipment.
O. Preventive Maintenance:
    1. Using material previously provided, review preventative maintenance (PM) lists including:
        a. Reference material.
        b. Daily, weekly, monthly, quarterly, semiannual, and annual jobs.
    2. Demonstrate procedures to perform PM jobs.
    3. Show Owner's personnel what to look for as indicators of equipment problems.
    4. Facilitate discussion with Owner's personnel as to which PMs to continue after the warranty period.
P. Corrective Maintenance:
    1. List potential problems including troubleshooting recovery from adverse operating conditions.
    2. Identify, describe, instruct and provide via the transmittal process any special tools required for maintenance.
    3. Describe Recommended measuring instruments and procedures and provide instruction on interpreting alignment measurements as appropriate.
    4. Describe recommended procedures to check/test equipment following a corrective maintenance (CM) repair.
    5. Open equipment and demonstrate procedures, where practical.
Q. Parts:
    1. Show how to use previously provided parts list and properly identify parts to be ordered.
    2. Define and check spare parts on hand and identify minimum inventory levels.
R. Local Representatives:
    1. Where to order parts: Name, address, telephone.
    2. Service problems:
        a. Who to call.
        b. How to get emergency help.
S. Original Equipment Manufacturer (OEM) Operation and Maintenance (O&M) Manuals:

1. Review any other material submitted.
2. Update material as required.

2.05 VIDEO RECORDING

A. The Contractor shall retain the services of a commercial videotaping service to record each training session. If trainer is required to read a script during videotaping, the trainer will have one video recorded session without personnel and the remaining sessions with personnel will be untaped. After taping, the material may be edited and supplemented with professionally produced graphics to provide a permanent record. The Contractor shall advise all manufacturers providing training sessions that the material may be videotaped and shall make available to the Owner's videotaping contractor such utility services and accommodations as may be required to facilitate the production of the video tape record. Video recording shall be integrated into electronic O&M by the Design-Builder or Contractor.
B. Include classroom and field instruction with question and answering periods.
C. Owner approval required for producer of video materials.
D. Digital recording shall become the property of the Owner.
E. Audio quality should not degrade during the recording of the field sessions due to background noise, space, distance, or other factors. Trainer will verify that audio quality after the first training session.
F. Trainer shall record the first training session and verify it presents accurately.
G. Video files shall be a file format and delivery medium as directed and approved by Owner.
H. Electronic copies of the other training material shall be tagged per Owner Standards to be provided by the Owner by the Contractor or Design-Builder
I. Provide 2 complete sets of video materials fully indexed and catalogued with printed labels sating session content and dates recorded or an indexed video file to each segment of the training.
J. Contractor shall provide a written release from all claims to the recorded training material produced.

2.06 ATTENDANCE

A. Trainer shall keep an attendance log of all attendees.
B. Trainer shall have the trainees each sign an attendance form at the beginning and end of the training session.
C. These records shall be provided to the appropriate Division Manager in which the training is being provided.

2.07 TRAINING SCHEDULE

A. Draft Training Schedule for the entire project shall be submitted after the first item requiring training arriving on the site. When approved, the training schedule shall be integrated into the project schedule.
B. List specified equipment and systems that require training services and show:
    1. Respective manufacturer
    2. Estimated dates for installation completion
    3. Estimated training dates
C. Training is a prerequisite for putting equipment into operation. Staged or partial training may be approved by the Owner's Representative.
D. Allow for separate training sessions for maintenance staff and operations staff. Owner will notify the trainer if it is desired to have separate sessions for maintenance and operations staff or have combined sessions.

E. Allow for multiple session for Operations training:
    1. Provide a minimum of three training sessions to accommodate different shifts. One will be for each shift: day, evening, and night on at least two days, or as determined appropriate to meet the Owner's requirements.
    2. Adjust schedule to ensure training of appropriate personnel as deemed necessary by Owner, and to allow full participation by manufacturers' representatives. Adjust schedule for interruptions in operability of equipment,
    3. Coordinate with section 01320 "Construction Progress Documentation," and Section 01757, "Commissioning."
F. Contractor shall provide a draft training schedule 30 days after the notice to proceed.
G. Schedule Owner's staff training within the constraints of their workloads. Those who will participate in this training have existing full-time work assignments, and training is an additional assigned work task, therefore, scheduling is imperative. Owner staff work schedules are variable for operations staff, as treatment facilities are typically operated on an around- the-clock basis.
H. Training sessions will be finalized two weeks prior to the training.
I. Training sessions that are rescheduled after a finalized date will be rescheduled at least two weeks out.
J. Commissioning Manager is responsible for preparing agendas and meeting minutes.

PART 3 – EXECUTION

3.01 TRAINING

A. Training shall be conducted in conjunction with the operational testing and commissioning periods. Classes shall be scheduled such that classroom sessions are interspersed with the instruction in logical sequence. The Contractor shall arrange to have the training conducted on consecutive days if approved by the Owner's Representative. Concurrent classes shall not be allowed.
B. Instructors shall apply adult education best practices, emphasizing learner participation and activity.
C. Unless otherwise agreed by the Owner, classes shall be repeated twice for a morning session, afternoon session, and a night session in order to have all three operations shifts trained. Adjust training schedule to ensure training of appropriate personnel deemed necessary by Owner, and to allow full participation by manufactures' representatives. Adjust schedule for interruptions in operability of equipment. Coordinate training efforts with Section 01320 Construction Progress Documentation and Section 01757 - Commissioning.
D. Approved operation and maintenance manuals for the special equipment shall be provided to the Owner prior to the start of the training. Videotaping shall take place concurrently with the training sessions.
E. Pre-startup Training shall be coordinated with Owner's operating personnel and Manufacturers' representatives, and with submission of Operation and Maintenance manuals. Pre-startup Training shall be completed at least 14 calendar days prior to beginning of system startup.
F. Post-startup Training, if required in specifications, shall be furnished and coordinated with Owner's operating personnel by the respective manufacturers' representatives.
G. Trainees will keep training materials and documentation after the session.
H. Operations and maintenance manuals as specified in technical sections:
    1. Provide a minimum of 2 copies of final Engineer-approved operations and maintenance manuals for use during the classroom instruction.

2. Owner reserves the right to delay training for a particular equipment item if the operations and maintenance manuals for that equipment are incomplete, inaccurate, or otherwise not in a format or stage of development for use by the Owner's staff.
3. No contract extensions or extra costs will be allowed for training delays due to operations and maintenance manual submittal delays.

I. Provide Supplemental documentation handouts to support instruction.

J. The following services shall be provided for each item of equipment or system. Additional services shall be provided when specifically required in individual specification sections.
   1. As a minimum, classroom training for operations personnel will include:
      a. Use of electronic media and drawings.
      b. Discussion of the equipment's specific location in the plant and operational overview.
      c. Purpose and plant function of the equipment.
      d. A working knowledge of the operating theory of the equipment.
      e. Start-up, shutdown, normal operation, emergency operating procedures, including discussion on system integration and electrical interlocks, if any.
      f. Identify and discuss safety items and procedures.
      g. Routine preventive maintenance, including specific details on lubrication and maintenance of corrosion protection of the equipment and ancillary components.
      h. Operator detection, without test instruments, of specific trouble symptoms.
      i. Required equipment exercise procedures and intervals.
      j. Routine disassembly and assembly of equipment if applicable (as judged by the Owner on a case-by-case basis) for purposes such as operator inspection of equipment.
   2. As a minimum, hands-on equipment training for operations personnel will include:
      a. Identify location of equipment and review the purpose.
      b. Identifying piping and flow options.
      c. Identifying valves and their purpose.
      d. Identifying instrumentation:
         (1) Location of primary element.
         (2) Location of instrument readout.
         (3) Discuss purpose, basic operation, and information interpretation.
      e. Discuss, demonstrate, and perform standard operating procedures and round checks.
      f. Discuss and perform the preventive maintenance activities.
      g. Discuss and perform startup and shutdown procedures including alternative strategies.
      h. Perform the required equipment exercise procedures.
      i. Perform routine disassembly and assembly of equipment if applicable.
      j. Identify and review safety items and perform safety procedures, if feasible.
   3. Classroom equipment training for the maintenance and repair personnel will include:
      a. Theory of operation.
      b. Description and function of equipment.
      c. Startup and shutdown procedures.
      d. Normal and major repair procedures.
      e. Equipment inspection and troubleshooting procedures including the use of applicable instruments and the "pass" and "no pass" instrument readings.
      f. Routine and long-term calibration procedures.

g. Safety procedures.
h. Preventive maintenance such as lubrication, normal maintenance such as belts, seals, and bearing replacement; and up to major repairs such as replacement of major equipment part (s) with the use of special tools, bridge cranes, welding jigs, etc.

4. Hands-on Equipment training for maintenance and repair personnel shall include:
    a. Locate and identify equipment components.
    b. Review the equipment function and theory of operation.
    c. Review normal repair procedures including corrective maintenance.
    d. Perform startup and shutdown procedures.
    e. Review and perform safety procedures.
    f. Perform Owner approved practice maintenance and repair job(s), including mechanical and electrical adjustments, calibration, and troubleshooting equipment problems.
5. Distribute Training Evaluation Form following each training session.
    a. Training Evaluation Form is included in Section 01757 –Commissioning.
    b. Return completed Training Evaluation Forms to Owner's designated training coordinator immediately after session is completed.
    c. Revise training sessions judged "Unsatisfactory" by a majority of attendees.
    d. Conduct training sessions again until a satisfactory rating is achieved at no additional cost to Owner.
6. Post Training Session
    a. Training Course Material: Due 14 days after class completion.
    b. Video Recording tagged and other materials tagged.
    c. Class Attendance Sheet and trainee acknowledgment that they were trained and able to run the equipment.
    d. Training Agenda, Lesson Plan, presentation, handouts
    e. Other audio-visual aids utilized during each training course.
    f. Provide material for all sessions of the class in a single transmittal.
    g. Format: 2 electronic copies and 3 hard copies organized in notebooks.

K. Closeout Documentation
1. Provide Training Documentation including submission to MDNR for operator training credit. Trainer will be required to submit any additional information required by MDNR.
2. Provide training certification and records of training acceptance by MDNR.

END OF SECTION

SECTION 01700 – TRAFFIC CONTROL

PART 1 – GENERAL

1.01 SUMMARY

A. The Contractor shall provide all materials, labor, and equipment (including permits, barricades, cones, drums, construction warning signs, flagmen incidental devices) to protect, warn and guide: vehicular traffic, pedestrian traffic and to protect their personnel and equipment on the site. This specification applies to work being done in conjunction with capital projects and not emergencies or other maintenance-related activities.

1.02 SPECIFICATION MODIFICATIONS

A. It is understood that throughout this section these specifications may be modified by appropriate items in Section 01015 – Specific Project Requirements, or as otherwise indicated on the Contract Drawings.

1.03 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:

1. Section 01700.A – Traffic Control Formula.xls
2. Section 01700.B – Street Guide.pdf

1.04 CODES AND STANDARDS

A. The publications listed below form a part of this specification to the extent referenced. The publications referred to within the specification are by the basic designation only.

B. American Traffic Safety Services Association (ATSSA)

C. "City of Kansas City, Missouri Public Works Department Construction and Material Specifications" (http://kcmo.gov/) (KCMO PW 2305 – Traffic Control – Pedestrian Traffic Control and Sidewalk Closure.)

D. Manual on Uniform Traffic Control Devices (MUTCD).

E. MODOT traffic control and regulations and permits.

1.05 DEFINITIONS

A. City Block – A segment of a street or roadway between two intersections.

B. Working Hours – The Contractor must conduct construction operations in compliance with the City of Kansas City, Missouri Code of Ordinances, Chapter 46 – NOISE CONTROL which generally defines normal working hours as 7:00 am to 6:00 pm on weekdays. Working hours also include any time period approved in writing by the City (see Section 01000 – General Project Requirements, paragraph TEMPORARY ENVIRONMENTAL PROTECTION).

C. Non-Working Hours – Any period of time not defined as Working Hours.

D. Public Works Department – The City of Kansas City, Missouri – Public Works Department.
E. Traffic Control Supervisor – The qualified employee of the Contractor designated to have overall responsibility of the implementation of the Traffic Control Plan, conformance to the Traffic Control Permit and maintenance of traffic control devices.
F. Work Zone – An area of active construction activity along a single street that causes temporary disruption to pedestrian traffic, vehicular traffic, access to properties, or on-street parking.
G. Extended Work Zone – Any work that encompasses more than one city block or street.

1.06 SUBMITTALS

A. Submit as specified in Section 01300 – Submittals.
B. Shop Drawings:
    1. Not applicable.
C. Product Data:
    1. Not applicable.
D. Samples:
    1. Not applicable.
E. Other Submittals:
    1. Traffic Control Plans(s):
        a. Submit plan(s) directly to the Public Works Department for review and approval as required for permitting. Approval of the traffic control plan is required prior to submitting permit applications.
        b. Submit the final, approved plan(s) in accordance with Section 01300 – Submittals for informational purposes only.
        c. Submit changes or revisions to the plan(s) as required by the City's Traffic Control Permit.
        d. Submit changes or revisions to the Traffic Control Plan necessary for construction phasing.
    2. Traffic Control Permit – submit a copy of the traffic control permit upon approval from the Public Works Department.
    3. Traffic Control Supervisor:
        a. Submit name, qualifications, and contact information in accordance with Section 01300 – Submittals.
        b. Submit name, qualifications, and contact information directly to the Public Works Department.
    4. Public Works Department standard specifications.
    5. Public Works Department standard details.
    6. Maintenance records of traffic control devices.

1.07 GENERAL

A. When the requirements of this section conflict with the requirements of the approved Traffic Control Permit, then the requirements of the Traffic Control Permit shall govern. In all instances, the Contractor shall comply with all KCMO ordinances.

B. The Contractor shall maintain access for pedestrians, vehicles and all properties served by the streets and sidewalks within the site.

C. All work shall be coordinated through the City of Kansas City, Missouri – Public Works Department.

D. Coordination of the traffic control permit shall be conducted during normal business hours (8:00 am through 5:00 pm).

1.08 SPECIFIC PROJECT REQUIREMENTS

A. Specific traffic control requirements are provided in Section 01015 – Specific Project Requirements.

1.09 RESPONSIBILITY

A. The Contractor shall designate a Traffic Control Supervisor having the responsibilities defined in paragraph DEFINITIONS.

B. The Traffic Control Supervisor's name, contact information and qualifications shall be submitted to the City prior to the preconstruction conference.

C. The Traffic Control Supervisor's name and contact information shall be submitted to the Public Works Department as required by the Traffic Control Permit. The contact information provided shall allow the City (Public Works Department) to contact the Traffic Control Supervisor during both working and non-working hours. This information shall be submitted with the application for the Traffic Control Permit and in accordance with paragraph SUBMITTALS.

1.10 SUBMITTAL OF STANDARD DETAILS AND SPECIFICATIONS

A. The Contractor shall obtain a copy of all Public Works Department's standard specifications and details to be used as part of the project. Copies shall be submitted in accordance with paragraph SUBMITTALS.

1.11 ACCESS REQUIREMENTS

A. Unless otherwise stated in Section 01015 – Specific Project Requirements, the Contractor shall maintain access for pedestrians and vehicles to all properties served by streets and sidewalks affected by the Work.

B. Special Restrictions for Extended Work Zones:

1. A maximum of two (2) consecutive city blocks shall be under construction at any one time.
2. Where construction activities cause disruption (i.e. sidewalk closures and/or temporary restriction of on-street parking) to two (2) consecutive city blocks the following restrictions shall apply:

a. At a minimum, pedestrian access shall be maintained on one side of the street only if work can be completed in less than fifteen (15) days. Sidewalk closures shall be limited and temporary facilities shall be provided as necessary to allow pedestrian access to all occupied properties affected by construction activities.
b. If more than one (1) city block is affected by construction, then construction activities shall be conducted so that on-street parking is maintained on at least one side of the street, on one of the city blocks affected. That is, if on-street parking is eliminated within a city block, the adjacent city block (along the same street) must provide at least on-street parking on one side.
c. If a sidewalk will need to be closed more than 15 days, advance approval of the Bike Pedestrian Advisory Committee is required. If a sidewalk closure is planned for more than 15 days in the Greater Downtown Area Plan region, advance approval is required from the Parking and Transportation Commission.

C. Access to adjacent properties served by the street(s) within the project shall be maintained at all times.

D. Traffic shall move through the construction site in accordance with the Traffic Control Permit.

E. When required, flaggers shall coordinate the movement of traffic through the construction site.

F. Temporary Restoration of Access during Non-Working Hours:
1. All roadways shall be re-opened to traffic in accordance with the Traffic Control Permit or to normal operating conditions (whichever applies) at the end of each work day.
2. No construction related equipment or material shall be on the roadway outside of normal working hours unless approved by the City (see Section 01000 – General Project Requirements, paragraph CONSTRUCTION SITE PLAN).

1.12 TRAFFIC CONTROL PLAN(S)

A. Unless otherwise indicated on the Drawings or in Section 01015 – Specific Project Conditions, the Contractor shall be responsible for the development and implementation of the Traffic Control Plan necessary to obtain a Traffic Control Permit(s).

B. All costs associated with development, revision or finalization of Traffic Control Plan(s) shall be included in the Contractor's Bid.

C. General Traffic Control requirements shall include but are not limited to the following:
1. MUTCD requirements shall be maintained on all traffic control plan submittals.

2. Plans shall clearly identify all traffic control devices to be placed including the location, spacing and other pertinent data required for the traffic control plan reviews.
3. Plan reviews and resubmittal reviews should be scheduled to be completed with at least two (2) weeks for City staff review on standard traffic control plan submittals. This time may be extended if the plan is complex or of a large volume.
4. All street typologies listed on the Major Street Plan (https://www.kcmo.gov/city-hall/departments/city-planning-development/other-city-plans) will be required to maintain a minimum of one twelve foot (12') lane in each direction for traffic at all times.
5. Limited closures on street typologies listed on the Major Street Plan may be allowed but will likely be limited to weeknights and/or weekend work depending on the location of the proposed closure. Full closures may not be possible in some areas of the City.
6. Electronic Message Boards will be required as part of the communication plan for all lane closures or restrictions on street typologies listed on the Major Street Plan. These signs will need to be in place at least one (1) week prior to the lane closure or restriction and will need to be maintained throughout the closure duration.
7. Closures in and adjacent to the Streetcar Corridor will be required to have a Track Access Permit.
8. Residential street traffic control plans will be developed in a way to allow safe travel and maintain access to all properties adjacent to and in the area of the traffic control area.
9. The Contractor is required to maintain the road surface condition on the haul route to the condition that existed at the time of permit issuance. All damage to the pavement on the haul route caused by the contractor shall be repaired by the Contractor at no additional cost to the City.

D. The following resources are provided for use by the Contractor to estimate the costs associated with the traffic control permits obtained for this contract. These resources are for estimating purposes only and the actual permit costs will be calculated by the Public Wors Department at the time of the permit application. The Contractor is responsible for all costs associated with the traffic control for this contract, including permit fees.
   1. Section 01700.A - Traffic Control Formula.xls
   2. Section 01700.B - Street Guide.pdf
   3. https://library.municode.com/mo/kansas_city/codes/code_of_ordinances?nodeId=COORKAMIVOII_CH70TRVE_ARTIIADEN_DIV1GE_S70-39AUDICLSTSIOTTRAUESEMPARE

1.13 TRAFFIC CONTROL PERMIT(S)

A. The Contractor shall not submit Traffic Control Permit applications until the traffic control plan has been approved by the Public Works Department.
B. The Contractor shall obtain a Traffic Control Permit before any construction activity occurs on any City street. Permits shall be obtained and submitted in accordance with Section 01300 – Submittals shall be made no less than two (2) weeks in advance of the construction activity.
C. Specific requirements and the application for Traffic Control Permit can be downloaded from the City's website at http://kcmo.gov/
D. The associated permit fees, which may be time and street-type-dependent, are to be obtained from the Public Works Department.
E. All residential, arterial and collector streets require a separate permit and are subject to peak hour restrictions.
F. All costs associated with the Traffic Control Permit(s) shall be included in the Contractor's Bid.

1.14 NOTIFICATIONS

A. Advance notification of affected property owners shall be done in accordance with Section 01581 – Public Communications.
B. Electronic Message Boards are required at least one (1) week in advance of any arterial street closure(s).

PART 2 – PRODUCTS

2.01 TRAFFIC CONTROL DEVICES

A. All traffic control devices shall conform to Part 6 of the "Manual on Uniform Traffic Control Devices" (MUTCD)
B. No substitutions for the devices required by MUTCD or changes in the methods of traffic control as outlined herein will be allowed without written approval of the Director of Public Works or their designee.

PART 3 – EXECUTION (NOT USED)

3.01 SAFETY PRECAUTIONS

A. Contractor shall take any and all precautions to guard against injury to persons or damage to property until final acceptance of the work by the City or their representative.
B. Precautions shall include, but no limited to, protection of vehicular and pedestrian traffic from injury or damage due to open excavations, operation of construction equipment, materials storage, etc. by the proper placement of appropriate safety devices.
C. The Contractor shall maintain the safety devices and maintain their proper placement throughout the required period.
D. Construction practices shall be followed that will eliminate all safety hazards.

E. The roadway shall be kept clean and free of construction related debris at all time.

3.02 DEVICE INSTALLATION AND MAINTENANCE

A. Traffic control devices shall be installed and maintained in accordance with KCMO Specification 2305 with the exception that the paragraphs for Method of Measurement and Basis for Payment do not apply.

B. The Contractor shall maintain records of any maintenance required and the date on which it was completed. These records shall be maintained for the duration of the project and submitted in accordance with paragraph SUBMITTALS on a monthly basis.

C. The contractor's designated Traffic Control Supervisor shall make regular workday inspections of the traffic control devices installed as part of Work.

D. It shall be the Contractor's responsibility to maintain all traffic control devices in proper working condition and placement at all times.

E. The Contractor shall immediately correct any deficiencies in traffic control.

F. Any traffic control device not in use shall be covered, removed, or turned away from the view of oncoming traffic.

3.03 CHANGES TO THE TRAFFIC CONTROL PLAN

A. Whenever the work area changes, all construction warning signs and traffic channelization devices shall be made current.

B. The Public Works Department reserves the right to adjust or revise the traffic handling requirements as necessary after construction on the project has started. These changes will be determined based on periodic inspections throughout the duration of the project by both the Water Services and Public Works inspection staff.

C. Notice of such change will be transmitted to the Contractor and it shall be the Contractor's responsibility to make the necessary changes as soon as practicable, but no more than one (1) calendar day, after receipt of the notification. Immediate changes to the traffic control shall be required in situations that are deemed as a public safety matter by the City representatives.

D. If the Contractor encounters conditions that would require a change in method of traffic control, the Contractor shall immediately notify the City's representative. At least 48 hours before the start of the proposed change, the City's representative will request approval of the change in method of maintaining traffic from the Public Works Department. The Contractor shall not proceed with the change without the approval of the Public Works Department.

3.04 PEDESTRIAN TRAFFIC CONTROL

A. Pedestrian traffic control shall conform to KCMO Specification 2305, paragraph-Pedestrian Traffic Control.

3.05 VEHICLE PARKING

A. Parking of construction vehicles, equipment, vehicles of contractor's personnel shall not interfere with public traffic, parking, access by emergency vehicles, or City operations.

3.06 HAUL ROUTES

A. The Contractor shall consult with the City (Water Services Department and Public Works Department) to establish public thoroughfares to be used for haul routes and site access.
B. Residential streets shall not be used as part of the proposed haul routes.

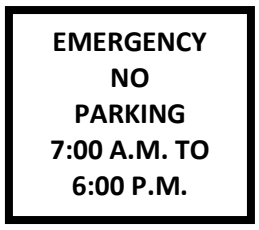
3.07 EMERGENCY CONDTIONS

A. Damage to existing utilities during construction of the Project which requires immediate repair may be considered as an emergency and as such may not be subject to all the restrictions contained herein. These shall be reported to Water Services and Public Works immediately. All subsequent emergency traffic control measures or adjustments shall be coordinated with the City representatives.
B. The Contractor shall immediately contact the utility company whose facilities are involved that may require immediate repair.
C. Such repair work, once declared an emergency by the utility company, shall be pursued on a continuous (24 hours per day) basis until complete or advanced to such a point that use of the roadway can be returned to normal operation and any subsequent repairs can be completed ruing regular working hours.
D. The City reserves the right to determine which utility work will be considered an emergency. Any costs incurred by the Contractor for such emergency utility repair, including the cost of any additional traffic control that may be required, shall be the Contractor's sole responsibility.

3.08 EMERGENCY NO PARKING SIGNS

A. When it is necessary to eliminate parking on a part of a street to facilitate construction work, the Contractor shall, subject to the approval of thePublic Works Department, post "Emergency No Parking" signs.
B. Signs shall be fabricated with the following dimensions, text sizes and include the follow text:

or



Placard Height: 24 inches
Placard Width: 18 inches
Placard Color: Silver (reflective)

Lettering Height: 3 inches
Line Spacing: 1.1 inches
Lettering Color: Red

Border Thickness: 0.625 inches
Border Margin from Edge of Placard: 0.375 inches
Border Color: Red

C. The signs shall be made of aluminum, plastic or plywood panels. Paper or cardboard signs are not allowed.
D. The signs shall be installed on either steel drive posts or existing utility poles at a height of five (5) feet to the bottom of the sign.
E. Signs shall be placed on the side of the street where parking is to be eliminated.
F. The signs are to be installed at the beginning and end of each block and at a maximum of 150-feet intervals in between.
G. These signs must be installed a minimum of 18 hours and a maximum of 48 hours in advance of the time the Contractor plans to begin work.
H. The Contractor shall contact the City's representative as soon as the signs are installed. The City's representative will then contact the Public Works Department as the signs are installed, so that a temporary regulation can be written by the Public Works Department and s that the Kansas City, Missouri, Police Department can be notified. The signs cannot be enforced without this notification from the City. The notification to the City must be made by 12 noon for enforcement to be effective the following day.
I. If there are existing parking signs with a lesser degree of restriction, the Contractor shall install the Emergency No Parking signs as outlined above and shall cover the existing signs with the Emergency No Parking sign or some type of semi-permanent cover (paper and tape will not be accepted).
J. The Contractor shall immediately remove the Emergency No Parking signs and all semi-permanent sign covers as soon as work on the block has been completed.
K. If it becomes apparent for any reason that work will cease for more than 72 hours, the same signs and covers shall be removed and must be reinstalled subject to the minimum eighteen (18) hours advance-notice before work can proceed.
L. If work does not begin within 48 hours after the signs are posted, the same procedure must be followed. Failure by the Contractor to abide by all the provisions concerning "Emergency No Parking" signs, shall result in the cancellation of the permit.
M. The Contractor shall maintain a minimum of one (1) lane of traffic each direction at all times unless otherwise allowed by permit.

N. The Contractor shall keep residents, schools, businesses, churches and other public entities informed of the work schedule that would interfere with access to their facility. Notification shall be distributed at least three (3) weeks in advance of work occurring near a facility.

O. The Contractor shall coordinate with KCATA, as necessary, on proposed lane closures impacting bus travel routes.

END OF SECTION

Section 01700.A - TRAFFIC CONTROL FORMULA

CLASSIFICATION	EXPECTED ADT	ADT TO BE USED	FACTOR FOR DIRECTIONAL OF TRAVEL	TWO WAY STREET	ONE WAY STREET
Expressways	at least 15,000 veh./day	15,000 veh./day			
Primary Arterials	at least 10,000 veh./day	10,000 veh./day			
Secondary Arterials	5,000 to 10,000 veh./day	5,000 veh./day	=	0.58	1.17
Other Streets	less than 5,000 veh./day	500 veh./day			

Total number of driving lanes for the direction of travel.	1	2	3	4	5
1 lane	1.17				
2 lanes	0.58	1.17			
3 lanes	0.39	0.78	1.17		
4 lanes	0.29	0.58	0.87	1.17	
5 lanes	0.23	0.46	0.69	0.92	1.17

A.)

[1] ADT	[2] NUMBER OF DAYS	[3] DETOUR DISTANCE IN LINEAR MILES	[4] UNIT COST	[5] 1 WAY/ 2 WAY SPECIFIC FACTOR DIRECTION OF TRAVEL	[6] NUMBER OF LANES SPECIFIC FACTOR FOR DRIVING LANES	[7] REDUCE CALCULATION	TOTAL COST	
0	0	0.0000	0.17	0	0	0	0.00	(SS0068)

B.) Parking Lanes:

NUMBER OF SIDES	UNITS	TRAFFIC CONTROL PERMIT FEE	NUMBER OF DAYS	TOTAL COST	
1	0.00	0.63	0	0.00	(SS0070)

C.) Sidewalks:

NUMBER OF SIDES	UNITS	COST FOR SIDEWALKS	NUMBER OF DAYS	REDUCED CALCULATION ADJACENT LANE	TOTAL COST	
1	0.00	0.67	0	0	0.00	(SS0069)

D.)

PARKING LANES LENGTH	R/W SECTION	TOTAL UNITS	
0	20	0.00	(SS0070)

E.)

SIDEWALK LENGTH	R/W SECTION	TOTAL UNITS	
0	20	0.00	(SS0069)

F.)

METER DAYS	NUMBER METERS	COST/ METER	TOTAL COST		
0	0	3.47	0.00	(SS0003)	(SS0071)

G.)

NUMBER OF ALLEYS	NUMBER OF DAYS	COST/ALLEY PER DAY	TOTAL COST
0	0	1.74	0.00

H.)

DETOUR DISTANCE IN LINEAR FEET	FEET/MILE LINEAR	DETOUR DISTANCE IN LINEAR MILES	
0	5280	0.0000	(SS0068)

I.)

APPLICATION FEE APPLIES	ADT TOTAL	PARKING TOTAL	SIDEWALK TOTAL	METER TOTAL	ALLEY TOTAL	GRAND TOTAL
$88.00	0.00	0.00	0.00	$0.00	$0.00	$88.00
(SS0067)	(SS0068)	(SS0070)	(SS0069)	(SS0003)	(SS0071)	

FREEWAYS

SOUTH OF THE RIVER

STREET	FROM	TO
Bruce R. Watkins Dr.	75th St.	Bannister Rd.
I-35	Missouri River	State Line
I-70	State Line	East City Limits
I-435 (East)	Missouri River	U.S. 71
I-435 (South)	State Line	U.S. 71
I-470	U.S. 71	I-70
I-670 (Crosstown Frwy.)	State Line	I-70
M-350	I-435 (East)	East City Limits
U.S. 71	Bannister Rd.	South City Limits
West Frwy.	I-70	I-670

EXPRESSWAYS

SOUTH OF THE RIVER

Blue Pkwy.	Swope Pkwy.	I-435
Bruce R. Watkins Dr.	51st St.	75th St.
Chouteau Trfwy.	Missouri River	Truman Rd.
Front St.	River Front Rd.	East City Limits

EXPRESSWAYS (continued)

	STREET	FROM	TO
SOUTH OF THE RIVER (continued)	M-150 (Outer Belt Rd.)	State Line	East City Limits
	Riverfront Rd.	I-35	Front St.
	Shawnee Mission Pkwy.	State Line	Ward Pkwy.
	Southwest Blvd.	Southwest Trfwy.	State Line
	Southwest Trfwy.	I-35	43rd St.
	Swope Pkwy.	The Paseo	Meyer Blvd.
	21st Century Pkwy.	State Line	M-150
	Ward Pkwy.	Brookside Blvd.	Shawnee Mission Pkwy.

PRIMARY ARTERIALS

SOUTH OF THE RIVER	23rd St.	State Line	Hardesty
	23rd St. Blvd.	Hardesty	Big Blue River
	23rd St.	Big Blue River	East City Limits
	31st St.	I-70	Southwest Blvd.
	51st-47th St.	Blue Pkwy.	I-470
	63rd St./ 63rd St. Trfwy.	Ward Pkwy.	East City Limits
	Hickman Mills Dr.	The Paseo	85th St.
	85th St.	State Line	Hickman Mills Dr.

PRIMARY ARTERIALS (continued)

SOUTH OF THE RIVER (continued)

STREET	FROM	TO
87th St.	Bruce R. Watkins Dr.	Military Club Rd.
109th St.	Raytown Rd.	East Longview Pkwy.
Bannister Rd.	State Line	M-350
Blue Ridge Blvd.	State Line	129th St.
Blue Ridge Blvd.	Winner Rd.	9th St.
Blue Ridge Cut-Off	U.S. 40	Raytown City Limits
Blue River Rd.	Bruce R. Watkins Dr.	Blue Ridge Blvd. Ext.
Broadway - J.C. Nichols Pkwy.	I-70	Ward Pkwy.
Brookside Blvd.	Ward Pkwy.	Meyer Blvd.
Brush Creek Blvd.	Elmwood	Bruce R. Watkins Dr.
Cherry St.	Holmes Rd.	Heart of America Bridge
Chestnut Trfwy.	Independence Ave.	Riverfront Rd.
County Line Rd. (155th St.)	Grandview City Limits	East City Limits
East Longview Pkwy.	109th St.	Noland Rd.
Gregory Blvd.	Bruce R. Watkins Dr.	Noland Rd.
Gregory Blvd. Ext.	Noland Rd.	East City Limits

PRIMARY ARTERIALS (continued)

SOUTH OF THE RIVER (continued)

STREET	FROM	TO
Hardesty Ave.	Independence Ave.	31st St.
High Grove Rd.	U.S. 71	East City Limits
Holmes Rd.	Bannister Rd.	Cass County Line
Independence Ave.	Holmes	Highland Ave.
Independence Blvd.	Highland Ave.	Benton Blvd.
Independence Ave.	Benton Blvd.	Winchester Ave.
Main St.	I-70	Ward Pkwy.
Manchester Trfwy.	Truman Rd.	63rd St. Trfwy.
Martha Truman Rd.	State Line	U.S. 71
Meyer Blvd.	63rd St. at The Paseo	Swope Pkwy.
Military Club Rd.	87th St.	East Longview Pkwy.
Noland Rd.	I-70	Bannister Rd.
The Paseo	I-35	79th St.
Raytown Rd.	Stadium Dr.	I-470
Raytown Rd.	High Grove Rd.	M-150
Relocated Raytown Rd.	I-470	County Line Rd.
Red Bridge Rd.	State Line	U.S. 71
Riverfront Rd.	Front St.	Chouteau Trfwy.
Stadium Dr.	31st St.	I-435

PRIMARY ARTERIALS (continued)

	STREET	FROM	TO
SOUTH OF THE RIVER (continued)	Stadium Dr. (Dutton Brook-field Dr.)	I-435	U.S. 40 Highway
	State Line Rd.	75th St.	M-150
	Truman Rd. (15th St.)	Oak St.	East City Limits
	U.S. 24	Winchester Ave.	Winner Rd.
	U.S. 40	31st St.	East City Limits
	Van Brunt Blvd.	27th St.	Elmwood
	Volker Blvd.	Brookside Blvd.	The Paseo
	Ward Pkwy.	Shawnee Mission Pkwy.	Wornall Rd.
	West Longview Pkwy.	87th St.	Raytown Rd.
	Winner Rd.	U.S. 24	East City Limits
	Wornall Rd.	Ward Pkwy.	Bannister Rd.

SECONDARY ARTERIALS

SOUTH OF THE RIVER	9th St.	Broadway	Winner Rd.
	9th St.	State Line	I-35
	10th St.	Broadway	Woodland Ave.
	11th St.	Broadway	Woodland Ave.

SECONDARY ARTERIALS (continued)

SOUTH OF THE RIVER (continued)

STREET	FROM	TO
12th St.	State Line	Winchester Ave.
13th St.	I-70 Ramps at Charlotte	I-29
14th St.	Holmes	I-29
18th St.	Broadway Blvd.	Hardesty Ave.
27th St.	Main St.	Van Brunt Blvd.
33rd St.	Southwest Trfwy.	Broadway
35th St.	The Paseo	Cleveland
39th St.	State Line	Van Brunt Blvd.
43rd St.	State Line	Main St.
47th St.	Roanoke Pkwy.	The Paseo
55th St.	Ward Pkwy.	Cleveland Ave.
63rd St.	State Line	Ward Pkwy.
75th St.	State Line	Bruce R. Watkins Dr.
79th St.	Oldham Rd.	Raytown Rd.
79th St.	State Line	Wornall Rd.
91st St.	Hillcrest Rd.	Blue River Rd.
107th St.	Blue Ridge Blvd.	Raytown Rd.
135th St.	State Line	Holmes Rd.
139th St.	Holmes Rd.	U.S. 71
155th St.	U.S. 71 Hwy.	Southport Pkwy.

SECONDARY ARTERIALS (continued)

SOUTH OF THE RIVER (continued)

STREET	FROM	TO
Admiral Blvd.	Broadway	The Paseo
Armour Blvd.	Broadway	The Paseo
Baltimore Ave.	9th St.	Southwest Blvd.
Belleview Ave.	43rd St.	Ward Pkwy.
Benton Blvd.	St. John Ave.	Swope Pkwy.
Blue River Rd.	Bruce R. Watkins Dr.	Oldham Rd.
Blue Ridge Blvd.	Independence City Limits	Raytown City Limits
Brooklyn Ave.	Independence Ave.	Brush Creek Blvd.
Brookside Rd.	Meyer Blvd.	85th St.
Brush Creek Blvd.	Bruce R. Watkins Dr.	Paseo Blvd.
Charlotte St.	Linwood Blvd.	Independence Ave.
Cleveland Ave.	Truman Rd.	Swope Pkwy.
Cleveland Ave.	Meyer Blvd.	Gregory Blvd.
Food Lane Rd.	Longview Rd.	M-150
Gillham Rd./ Gillham Plaza	Pershing Rd.	Rockhill Rd. at 42nd St.
Genessee	12th St.	23rd St. Viaduct
Grand Ave.	I-70	27th St. at Main

SECONDARY ARTERIALS (continued)

SOUTH OF THE RIVER (continued)

STREET	FROM	TO
Grandview Rd.	Blue River Rd.	Martha Truman Rd.
Gregory Blvd.	Ward Pkwy.	Bruce R. Watkins Dr.
Hickory St.	9th St.	I-670
Hickman Mills Dr.	Bannister Rd.	U.S. 71
Hickman Mills Dr. Ext.	Bannister Rd.	87th St.
Hillcrest Rd.	87th St.	Bannister Rd.
Holmes Rd.	9th St.	31st St.
Holmes Rd.	Rockhill Rd. at 66th St.	Bannister Rd.
Jackson Ave.	Linwood Blvd.	Truman Rd.
Jackson Ave.	Red Bridge Rd.	Grandview Rd.
James A. Reed Rd.	West Longview Pkwy.	63rd St. Trfwy.
Kenneth Rd.	21st Century Pkwy.	Prospect
Leeds Trfwy.	Van Brunt Blvd.	Stadium Dr.
Lee's Summit Rd.	I-70	East City Limits
Linwood Blvd.	Broadway	Van Brunt Blvd.
Longview Rd.	Grandview Rd.	Raytown Rd.
Madison Ave.	43rd St.	47th St.
Meyer Blvd.	Ward Pkwy.	The Paseo

SECONDARY ARTERIALS (continued)

SOUTH OF THE RIVER (continued)

STREET	FROM	TO
Norfleet Rd.	47th St.	63rd St. Trfwy.
Oak St.	I-70	Pershing Rd.
Oldham Rd.	Gregory Blvd.	87th St.
Ozark Rd.	I-435	Raytown Rd.
Pershing Rd.	West Pennway	Gillham Rd.
Prospect Ave.	Independence Ave.	Blue River Rd.
Prospect Ave.	139th St.	Kenneth Rd.
Red Bridge Rd.	U.S. 71	Blue Ridge Blvd.
Rhinehart Rd.	East City Limits	Gregory Blvd. Ext.
Roanoke Pkwy.	43rd St.	Ward Pkwy.
Rockhill Rd.	42nd St.	Holmes Rd. at 66th Terr.
St. John Ave.	Benton Blvd.	Chouteau Trfwy.
Sni-A-Bar Rd.	Blue Pkwy.	I-435
Southport Pkwy.	State Hwy. 150	155th St.
State Line Rd.	Shawnee Mission Pkwy.	75th St.
Sterling Ave.	I-70	South City Limits
Swope Pkwy.	Benton Blvd.	Meyer Blvd.
Troost Ave.	Independence Ave.	Bannister Rd.

SECONDARY ARTERIALS (continued)

SOUTH OF THE RIVER (continued)

STREET	FROM	TO
Velie Rd.	Blue Ridge Blvd.	Lee's Summit Rd.
Winchester Ave.	Independence Ave.	Truman Rd.
Winner Rd.	9th St.	Independence Ave.
Woodland Ave.	79th St.	85th St.
Wornall Rd.	Ward Pkwy at 48th St.	Ward Pkwy (north of Bannister)
Wornall Rd.	Bannister Rd.	135th St.
Wyandotte St.	I-70	Southwest Blvd.
Wyoming St.	12th St.	23rd St. Viaduct

APPENDIX A - MAJOR STREETS INVENTORY

FREEWAYS

NORTH OF THE RIVER

STREET	FROM	TO
I-29	Missouri River	North City Limits
I-35	Missouri River	North City Limits
I-435 (West)	Missouri River	I-29
I-435 (North)	I-29	M-291
I-435 (East)	Missouri River	M-291
I-635	Missouri River	I-29
M-152	I-435 (West)	I-435 (East)
M-210	I-29	I-435 (East)
U.S. 169	I-29	North City Limits

EXPRESSWAYS

NORTH OF THE RIVER

N. Chouteau Trfwy.	Missouri River	M-210
N. Broadway Ext.	Missouri River	I-29
N. Burlington (M-9)	Missouri River	N. Broadway Ext.
M-92 (relocated)	I-29	N.W. Interurban Rd.
M-152	I-435 (East)	M-291
M-291	M-210	I-35

EXPRESSWAYS (continued)

	STREET	FROM	TO
NORTH OF THE RIVER (continued)	M-291	I-35	I-435 (East)
	River Rd. (M-9)	I-635	N. Broadway Ext.

PRIMARY ARTERIALS

NORTH OF THE RIVER	M-45 & N.W. 64th St.	I-435 (West)	I-29
	N.E. 42nd/Parvin Rd. Diagonal	N. Oak Trfwy.	I-35
	N.W. 68th St.	Line Creek Pkwy.	Kansas City City Limits
	N.W. 68th St./ N.W. 64th St. Diagonal	I-29	Line Creek Pkwy.
	N.E. 72nd St.	Gladstone City Limits	Maplewood Pkwy.
	N.W. 96th St.	Line Creek Pkwy.	U.S. 169
	N.E. 96th St.	U.S. 169	Maplewood Pkwy.
	N.E. 96th St.	Shoal Creek Pkwy.	M-291
	N.W. 100th St.	I-435 (West)	N.W. Tiffany Springs Pkwy.
	N.E. 108th St.	Shoal Creek Pkwy.	M-291
	N.W. 108th St./ N.W. 112th Diagonal	N.W. Skyview Ave.	N. Congress Ave.

PRIMARY ARTERIALS (continued)

NORTH OF THE RIVER (continued)

STREET	FROM	TO
N.W. 108th St.	N.W. Skyview Ave.	Shoal Creek Pkwy.
N.W. 112th St.	KCI Airport	N.W. Interurban Rd.
N.W. 128th St.	Mexico City Ave.	N.W. Arrowhead Trfwy. (U.S. 169)
N.E. 132nd St./ 128th St. Diagonal	N.W. Arrowhead Trfwy. (U.S. 169)	East City Limits
N. Amity Ave.	N.W. Barry Rd.	N.W. 112th St.
N. Antioch Rd.	M-210	M-152
N.W./N.E. Barry Rd.	Platte County Rtes. "N" & "T"	Shoal Creek Pkwy.
N. Brighton Ave.	M-152 (relocated)	M-210
Chouteau Pkwy.	M-210	Englewood Blvd.
N.W./N.E. L.P.Cookingham Dr.	I-29	I-435 (East)
Englewood Blvd.	Line Creek Pkwy.	N.E. Antioch Rd.
N. Executive Hills Blvd.	N.W. Barry Rd.	N.W. Tiffany Springs Pkwy.
N. Green Hills Dr.	N.W. 79th St.	N.W. 108th St.
N. Indiana Ave.	M-152	Shoal Creek Pkwy.
Liberty Blvd. (U.S. 69)	Ruth Ewing Rd. (at I-35)	I-35 (at Vivion Rd.)
Line Creek Pkwy.	Englewood Blvd.	Shoal Creek Pkwy.

PRIMARY ARTERIALS (continued)

NORTH OF THE RIVER (continued)

STREET	FROM	TO
Maplewood Pkwy.	I-35	Shoal Creek Pkwy.
N. Mersington Ave.	Shoal Creek Pkwy.	I-435 (North)
Mexico City Ave.	N.W. 128th St.	KCI Airport
N. Oak Trfwy.	N. Burlington	Northeast L.P. Cookingham Dr.
N.E. Parvin Rd.	I-35	I-435 (East)
Platte City Rtes. "N" & "T"	River Rd.	M-152
N.E. Pleasant Valley Rd.	East of Gladstone City Limits	I-35
Searcy Creek Pkwy.	M-210	Maplewood Pkwy at I-35
Shoal Creek Pkwy.	Line Creek Pkwy.	Maplewood Pkwy.
N.W. Skyview Ave.	N. Executive Hills Blvd.	North City Limits
Tiffany Springs Pkwy.	West of N. Childress Ave.	Line Creek Pkwy.
N.W./N.E. Vivion Rd.	Highway AA	I-35
N.W. Waukomis Dr.	N.W. Vivion Rd.	N.W. 56th St.
N.W. Waukomis Dr.	N.W. 68th St.	N.W. 79th St.
N. Woodland Ave.	Shoal Creek Pkwy.	North City Limits

SECONDARY ARTERIALS

NORTH OF THE RIVER

STREET	FROM	TO
M-9	River Rd.	N.W. Barry Rd.
N.E. 48th St.	N. Brighton Ave.	N. Hughes
N.W. 56th St.	Coffey Rd.	Line Creek Pkwy.
N.W. 72nd St.	M-9	N. Baughman Rd.
N.W. 73rd St.	N.W. Mace Rd.	M-9
N.E. 76th St.	N. Brighton	East City Limits
N.W. 79th St.	N.W. Barry Brook Dr.	Line Creek Pkwy.
N.E. 96th St.	Maplewood Pkwy.	Shoal Creek Pkwy.
N.E. 104th St.	M-291	East City Limits
N.E. 112th St.	M-291	East City Limits
N.W. 136th St.	N. Bethel Ave.	East City Limits
N.W. 136th St.	Hwy. N	N. Bethel Ave.
Hwy. AA	M-9	I-29
N. Agnes Ave.	Northeast L.P. Cookingham Dr.	North City Limits
N. Ambassador Dr.	N.W. 104th St.	N.W. 128th St.

SECONDARY ARTERIALS (continued)

NORTH OF THE RIVER (continued)

STREET	FROM	TO
N.W. Barry Brook Dr.	N.W. Barry Rd.	N.W. 79th St.
N. Bethel Ave.	N.W. 136th	North City Limits
N. Brighton Ave.	M-152	Shoal Creek Pkwy.
N. Baughman Rd.	Line Creek Pkwy.	Northwest L.P. Cookingham Dr.
N. Childress Ave.	River Rd.	Tiffany Springs Pkwy.
N. Congress Ave.	N.W. Barry Rd.	Tiffany Springs Pkwy.
N. Congress Ave.	N. Executive Hills Blvd.	N.W. 128th St.
N.E. Davidson Rd.	N.E. Parvin Rd.	N.E. Vivion Rd.
N. Eastern Rd.	N.E. 96th St.	North City Limits
N. Executive Hills Blvd.	Tiffany Springs Pkwy.	N.E. 104th St.
First Creek Rd.	Northwest L.P. Cookingham Dr.	North City Limits
N. Flintlock Rd.	N.E. 76th St.	M-291
N. Hampton Rd.	M-152	N.W. 100th St. (Farley Rd.)
N. Home Ave.	N.E. 104th St.	North City Limits

SECONDARY ARTERIALS (continued)

NORTH OF THE RIVER (continued)

STREET	FROM	TO
N. Hughes Rd.	M-210	S. Liberty Pkwy. Corridor
N.W. Interurban Rd.	N.W. 128th St.	North City Limits
N.W. Mace Rd.	M-9	N.W. Barry Rd.
N. Mersington	I-435 (North)	North City Limits
Mexico City Ave.	N.W. 128th St.	North City Limits
N. Northwood	M-9	N.W. 64th St.
N.E. Parvin Rd.	I-435 (East)	M-210
N. Robinhood Lane	Line Creek Pkwy.	North City Limits
N.E. Sherman Rd.	M-291	North City Limits
N. Stark Ave.	M-291	North City Limits
Tiffany Park Rd.	I-435	N. Hampton Rd.
N.W. Tiffany Springs Rd.	N. Childress Ave.	N. Baughman Rd.
N. Topping Ave.	Shoal Creek Pkwy.	Northeast L.P. Cookingham Dr.
N. Winan Ave.	N. Ambassador Dr.	North City Limits

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

Public Works Department
Right-of-Way Permits
5th Floor, City Hall
Kansas City, MO 64106-2705

APPLICATION FOR TRAFFIC CONTROL PERMIT

APPLICANT Name:_____ Email:_____

FIRM RESPONSIBLE FOR EXCAVATION:_____

BUSINESS ADDRESS:_____ PHONE:_____

CITY/STATE/ZIP:_____

JOB FOREMAN NAME:_____ PHONE:_____

LOCATION AND EXPLANATION OF WORK

STREET ADDRESS:_____

DESCRIPTION OF AREA YOU WISH TO CLOSE:_____

_____

PROPOSED DETOUR (IF TOTAL CLOSURE):_____

_____

START DATE:_____ END DATE:_____

Traffic control plan matching MUTCD guidelines must be attached. No sidewalk will be closed more than 15 days without a traffic control plan depicting an alternate, adjacent pedestrian path.
I certify that I have read and understood and will comply with the requirements of the City of Kansas City Missouri Charter and Code Section 70-39.

APPLICANT SIGNATURE:_____ DATE:_____

SECTION 01757 - COMMISSIONING

PART 1 – GENERAL

1.01 SUMMARY

A. This Section includes the requirements for each Commissioning phase of, the Project equipment/system and/or facility.

1.02 DEFINITIONS

A. Commissioning - The process of planning, testing, and process start-up of the installation for compliance with contract requirements and demonstrating, through documented verification, that the project has successfully met the Contractual requirements. It includes training the Owner's staff to operate the facility.
B. Commissioning Phases - The work activities of facility commissioning are grouped into the phases defined in the table below.

Commissioning		
Planning Phase	**Testing and Training Phase**	**Process Start-Up Phase**
Owner Training Plan and Schedule	Source Testing	Process Start-up
Commissioning Schedule	Owner Training	Process Operational Period
Subsystem Testing Plan	Installation Testing	Instrumentation and Controls Fine-Tuning
	Functional Testing	
	Closeout Documentation	

C. Component - A basic building block of equipment, subsystems, and systems that requires installation or functional testing but does not have electrical connection or internal electronics. (Examples: filter effluent piping and manual isolation valves).
D. Device - A basic building block of equipment, subsystems, and systems that requires installation or functional testing and does have electrical connections or internal electronics. (Examples: filter level transmitter or water pump pressure transmitter).
E. Equipment - An assembly of component(s) and devices(s) that requires installation or functional testing. (Examples: Pump, motor, VFD, Ozone Generator, UV Disinfection System, etc.).
F. Facility - A grouping of process areas, systems, subsystems, equipment, components, and devices (Examples: treatment plant, pump station, etc.).
G. Functional Testing - Testing performed on a completed subsystem to demonstrate that equipment/system meets manufacturers' calibration and adjustment requirements and other requirements as specified. Functional testing includes operating equipment/system manually in local, manually in remote (or remote manual), and automatically in remote (in remote auto).
H. Installation Testing - Testing to demonstrate that subsystem component (piping, power, networks, devices, etc.) is ready and meets the project requirements in advance of functional testing. Installation testing also includes

manufacturers' certification of installation and other requirements as specified to prepare equipment/system for Functional Testing. Also referred to as Field Acceptance Testing.

I. Instrumentation and Controls Fine-Tuning - Improving the performance of the Instrumentation Process Control system by operating for an extended time period.

J. Manufacturer's Certificate of Source Testing - When applicable, the form is used during Source Testing for the manufacturer to confirm that the applicable source tests have been performed and results conform to the Contract Documents. The form is provided at the end of this Section.

K. Manufacturer's Certificate of Installation and Functionality Compliance - The form is used during Installation Testing and Functional Testing. It is submitted at the end of Functional Testing to confirm that the equipment/system is installed in conformance with the Contract Documents and that it meets the Functional Testing requirements defined in the Contract Documents. The form is provided at the end of this Section.

L. Process Area - A grouping of systems, subsystems, equipment, components, and devices that divide a facility into functional areas. (Examples: Filter Process Area or Chemical Area).

M. Process Operational Period - A period of time after completion of the process start-up set aside for final Operational Testing to verify facility performance meets the Contract Document requirements. This period may specifically limit other construction activities.

N. Process Start-up Phase - Operating the facility to verify performance meets the Contract Document requirements.

O. Process Start-Up - Activities conducted after the testing and training phase that are necessary to place systems or process areas into operational service.

P. Product - A system, subsystem or component.

Q. Subsystem - A building block of systems made up from a grouping of components, devices, and equipment that perform a definable function. (Examples: Filter No. 1 Backwash Subsystem, Sedimentation Basin No. 1 Hoseless Sludge Removal Subsystem).

R. System - A grouping of subsystems, equipment, components, and devices that perform a definable function. (Examples: Filter No. 1, Sedimentation Basin).

1.03 COMMISSIONING MANAGER

A. Designate and provide a COMMISSIONING MANAGER for this project.

B. Submit summary of the COMMISSIONING MANAGER's qualifications within 30 days of NTP:
    1. Include description of previous experience as a COMMISSIONING MANAGER on similar projects for the designated COMMISSIONING MANAGER with a list of references including phone numbers for review and Owner approval.

C. COMMISSIONING MANAGER responsibilities include the following:
    1. Lead efforts relating to Commissioning.
    2. Be thoroughly familiar with commissioning requirements in the Contract Documents.
    3. Be regularly engaged and experienced in all aspects of commissioning.
    4. Provide technical instruction for commissioning.
    5. Provide primary interface with Engineer and Owner for efforts relating to Commissioning of Project facilities.
    6. Coordinate training efforts.

D. COMMISSIONING MANAGER on-site:
    1. Testing and Training Phase: Full-time.
    2. Process Start-up Phase: Full-time.

E. Designate and provide COMMISSIONING MANAGER assistants, as needed.

1.04 SERVICES OF MANUFACTUERER'S REPRESENTATIVES

A. Qualification of manufacturer's representative as specified in the Contract Documents technical sections include the following:
    1. Authorized representative of the manufacturer, factory trained and experienced in the technical applications, installation, operation, and maintenance of respective equipment/system with full authority by the equipment/system manufacturer to issue the certifications required of the manufacturer.
    2. Competent, experienced technical representative of equipment/system manufacturer for assembly, installation, testing guidance, and training.
    3. Additional qualifications may be specified in the individual sections.
    4. Submit qualifications of the manufacturer's representative no later than 30 days in advance of required observations.
    5. Representative subject to approval by Owner and Engineer.
    6. No substitute representatives will be allowed until written approval by Owner and Engineer has been obtained.
B. Completion of manufacturer on-site services: Engineer approval required.
C. Manufacturer is responsible for determining the time required to perform the specified services.
    1. Minimum times specified in the Contract Documents are estimates.
    2. No additional costs associated with performing the required services will be approved.
    3. Manufacturer required to schedule services in accordance with the Contractor's project schedule up to and including making multiple trips to project site when there are separate milestones associated with installation of each occurrence of manufacturer's equipment.
D. Manufacturer's on-site services as specified in the Contract Documents include the following:
    1. Assistance during Commissioning Phase and Process Start-Up Phase.
    2. Provide daily copies of manufacturer's representatives field notes and data to Engineer.
    3. Services as specified in Section 01433 - Manufacturer's Field Services.
    4. Other requirements as specified in the Contract Documents.

1.05 PLANNING PHASE

A. Overview of Planning Phase:
    1. Define approach and timing for Commissioning.
B. Owner training plan and schedule:
    1. Complete as specified in Section 01664.
C. Commissioning Schedule:
    1. Commissioning overview:
        a. Comply with Commissioning Roles and Responsibilities Matrix specified at the end of this Section.
    2. Submittal due date:
        a. Submit Commissioning Schedule not less than 60 calendar days prior to planned initial commissioning of each subsystem or system.
    3. Schedule requirements:
        a. Schedule durations and float for commissioning activities to ensure Work does not fall behind schedule due to complications or delays during commissioning.
        b. Time-scaled network diagram detailing the work to take place in the period between 90 calendar days prior to planned initial commissioning of equipment and systems, and prior to the date of Substantial Completion, together with supporting narrative.
        c. Provide detailed schedule of commissioning activities including durations and sequencing requirements.

(1) Identify the following activities:
(a) Testing and Training Phase:
(i) Source Testing.
(ii) Owner Training.
(iii) Installation Testing.
(iv) Functional Testing.
(v) Clean Water Facility Testing.
(vi) Closeout Documentation.
(b) Process Start-Up Phase:
(i) Process Start-Up.
(ii) Process Operational Period.
(iii) Instrumentation and Controls Fine-Tuning.

d. Schedule manufacturer's services to avoid conflict with other on-site testing or other manufacturers' on-site services.
e. Verify that conditions necessary to allow successful testing have been met before scheduling services.

D. Subsystem testing plans:
1. Provide separate testing plans for each individual subsystem and system that include the following:
a. Approach to testing including procedures, schedule, and recirculation requirements.
b. Test objective: Demonstrate subsystem meets the design requirements as specified in the technical sections.
c. Test descriptions, forms, temporary systems (pumps, piping, etc.), shutdown requirements for existing systems, test forms, test logs, witness forms, and checklists to be used to control and document the required tests.
d. Test forms: Include, but not limited to, the following information:
(1) Tag and name of equipment/system to be tested.
(2) Test date.
(3) Names of persons conducting the test.
(4) Names of persons witnessing the test, where applicable.
(5) Test data.
(6) Applicable project requirements.
(7) Check offs for each completed test or test step.
(8) Place for signature of person conducting tests and for the witnessing person, as applicable.
e. Define start-up sequencing of unit processes:
(1) Include testing of alarms, interlocks, permissives, control circuits, capacities, speeds, flows, pressures, vibrations, sound levels, and other parameters.
(2) Provide detailed test procedures setting forth step-by-step descriptions of the procedures for systematic testing of equipment/system.
(3) Demonstrate proper rotation, alignment, speed, flow, pressure, vibration, sound level, adjustments, and calibration.
(a) Perform initial checks in the presence of and with the assistance of the manufacturer's representative.
(4) Demonstrate proper operation of each control loop function including mechanical, electrical, alarms, local and remote controls, instrumentation, and other equipment/system functions.

(a) Generate signals with test equipment/system to simulate operating conditions in each control mode.

2. Engineer approval of test plan is required prior to performing test.
    a. Revise and update test plans based on review comments, actual progress, or to accommodate changes in the sequence of activities.
    b. Submit test reports for each phase of testing for each equipment/system.
    c. Engineer approval of preceding test reports is required prior to start of next test.
    d. Tests will be rescheduled if test plan is not approved by the required deadline.
        (1) Contractor is responsible for any resulting delay.
3. Contractor is responsible to reproduce and distribute final test procedures.
    a. Provide 3 copies for Engineer.
4. Tests may commence only after Engineer has received approved test plan copies.
5. Submittals:
    a. Submit test plans not less than 90 calendar days prior to planned installation testing of subsystem or system.
    b. Completed Manufacturer's Certificate of Installation and Functionality Compliance.
    c. Test procedures and forms: Provide signed-off copy of test forms and test reports upon completion of the test.
    d. Test reports:
        (1) Submit preliminary copies within 1 day after testing completion.
        (2) Submit final copies and report within 14 days after testing completion.

1.06 TESTING AND TRAINING PHASE

A. Overview of Testing and Training Phase:
    1. General:
        a. Include specified Source Testing, Owner Training, Installation Testing, Functional Testing, Clean Water Facility Testing, and Closeout Documentation required by this Section and the technical sections.
    2. Contractor responsibilities:
        a. Furnish labor, power, chemicals, tools, equipment, instruments, and services required for and incidental to completing commissioning activities in accordance with the approved Commissioning Plans.
        b. Prior to testing, verify equipment protective devices and safety devices have been installed, calibrated, and tested.
        c. Acceptable tests: Demonstrate the equipment/system performance meets the requirements stated in the Contract Documents.
            (1) When the equipment/system fails to meet the specified requirements, perform additional, more detailed, testing to determine the cause, correct, repair, or replace the causative components and repeat the testing that revealed the deficiency.

B. Source testing:
    1. Also referred to as factory testing or factory acceptance testing (FAT).
    2. Test components, devices, and equipment/system for proper performance at point of manufacture or assembly as specified in the technical sections.
    3. Notify the Engineer in writing when the equipment/system is ready for source inspection and testing.
    4. Source Test Plan:

a. As specified in this Section and other technical sections.
b. Source testing requirements as specified in technical sections.
    (1) Non-witnessed: Provide Manufacturer's Certificate of Source Testing.
    (2) Witnessed: 1 Owner's representative and 1 Engineer's representative present during testing, unless otherwise specified, and provide Manufacturer's Certificate of Source Testing.
c. Prepared by Contractor as a result of discussions and planning emerging from regularly conducted commissioning meetings for source tests as specified in the Contract Documents.
d. Provide the following items for each Source Test:
    (1) Purpose and goals of the test.
    (2) Identification of each item of equipment/system, including system designation, location, tag number, control loop identifier, etc.
    (3) Description of the pass/fail criteria that will be used.
    (4) Listing of pertinent reference documents (Contract Documents and industry standards or sections applicable to the testing).
    (5) Complete description, including drawings or photographs, of test stands and/or test apparatus.
    (6) Credentials of test personnel.
    (7) Descriptions of test equipment to be used, product information, and all appropriate calibration records for the test equipment.
    (8) Test set-up procedures.
    (9) Detailed step-by-step test procedures.
        (a) The level of detail shall be sufficient for any witness with a rudimentary technical aptitude to be able to follow the steps and develop confidence that the tests were being performed as planned.
        (b) All steps are significant, and all steps shall be included in the procedures.
    (10) Sample data logs and data recording forms.
    (11) Sample computations or analyses with the results in the same format as the final report to demonstrate how data collected will be used to generate final results.
        (a) Complete disclosure of the calculation methodologies.
        (b) Include a sample for each type of computation required for the test and analysis of the results.
    (12) Detailed outline of the Source Test report.
    (13) Sample test reports.
e. Submit Source Test Plan and forms as specified in the technical sections.
    (1) Submit a copy of the Source Test Plan at least 21 days before any scheduled test date.
    (2) Engineer approval of Source Test Plan required prior to beginning source testing.
    (3) Schedule the testing after approval of the test procedures submittal.
f. Indicate the desired dates for source inspection and testing.
    (1) Notify the Engineer of the scheduled tests a minimum of 15 days before the date of the test.

5. Test results:
    a. Prepare and submit test results with collected data attached.
6. Owner is responsible for costs associated with Owner's representatives and Engineer's representative witnessing initial Source Tests.

a. If Source Test is not ready when the witnesses arrive or if the Source Test fails, the witnesses will return home with Contractor responsible for costs associated with the trip including costs described below. Contractor is responsible for rescheduling the Source Test and witnesses' costs associated with the second trip including costs described below.
    (1) On-site time: 1 day at the site plus travel time each direction, unless specified otherwise.
    (2) Transportation costs:
        (a) Travel 1 day on commercial airline to site including air flight costs.
        (b) Travel 1 day on commercial airline from site including air flight costs.
        (c) Mid-size rental car or taxi services from hotel to and from the test site plus fuel, tolls, and airport parking at the departing airport.
        (d) International travel: Per-diem rates as established by the US Department of State for the specific location and dates of travel. Travel expenses may include the direct cost of securing passports, visas, language interpreters, document translators, communications, and internet access.
    (3) Hotel costs at a facility with an American Automobile Association 3 diamond rating or better for single occupancy room per person per day.
    (4) Meal allowance of $61 per person per day.
    (5) On-site time: 1 day at the site, unless specified otherwise.
    (6) Only actual costs will be documented and billed.

b. Fees incurred such as airline reservation change fees, loss of fare due to purchase of nonrefundable tickets, hotel cancellation/rebooking fees, and similar expenses incurred as a result of OSS-requested changes to the inspection schedule after the initial notification shall be borne by the Contractor.

c. Contractor is responsible for witnesses' costs associated with retests including costs described above.

7. Contractor is responsible for providing fuel, chemicals, and other consumables needed for Source Testing.

C. Owner training:
1. Provide training as specified in Section 01664.

D. Installation Testing:
1. Perform subsystem testing according to approved Subsystem Testing Plans.
2. Initiate the Manufacturer's Certificate of Proper Installation for all equipment.
    a. Manufacturer's Certificate of Proper Installation form is included in this Section.
    b. Manufacturer's Certificate of Proper Installation certifies the equipment meets the following requirements:
        (1) Has been properly installed, adjusted, aligned, and lubricated.
        (2) Is free of any stresses imposed by connecting piping or anchor bolts.
        (3) Is able to be operated as necessary for Functional Testing.
    c. Form shall be submitted after completion of Functional Testing, as specified in this Section.
3. Coordinate Installation Testing with restrictions and requirements as specified in Section 01140 - Work Restrictions.
4. Perform coating holiday testing as specified in Section 09960 - High- Performance Coatings.
5. Perform pressure and leakage testing as specified in individual component Sections.
6. Perform mechanical equipment Installation Testing: As in individual equipment sections.
    a. Remove rust preventatives and oils applied to protect equipment during construction.
    b. Flush lubrication systems and dispose of flushing oils.

(1) Recharge lubrication system with lubricant recommended by manufacturer.

c. Flush fuel system and provide fuel for testing and start-up.
d. Install and adjust packing, mechanical seals, O-rings, and other seals. Replace defective seals.
e. Remove temporary supports, bracing, or other foreign objects installed to prevent damage during shipment, storage, and erection.
f. Check rotating machinery for correct direction of rotation and for freedom of moving parts before connecting driver.
g. Perform cold alignment and hot alignment to manufacturer's tolerances.
h. Adjust V-belt tension and variable pitch sheaves.
i. Inspect hand and motorized valves for proper adjustment.
(1) Tighten packing glands to ensure no leakage but permit valve stems to rotate without galling.
(2) Verify valve seats are positioned for proper flow direction.
j. Tighten leaking flanges or replace flange gasket.
(1) Inspect screwed joints for leakage.
k. Install gratings, safety chains, handrails, shaft guards, and sidewalks prior to operational testing.

7. Electrical devices and subsystems Installation Testing: As specified in Section 16950 - Electrical System Testing and Settings, and the technical sections.
8. Instrumentation devices and subsystems Installation Testing
9. Heating, ventilating, and air conditioning systems Installation Testing:
a. Perform testing of heating, ventilating, and air conditioning equipment, balancing of distribution systems, and adjusting of ductwork accessories.
b. Test hydronic systems, if required by technical sections.

E. Functional Testing:
1. Perform subsystem testing according to approved Subsystem Testing Plan.
2. Notify the Engineer 5 days prior to when the Work is ready for Functional Testing.
a. Perform testing in the presence of the Engineer.
3. Determine Functional Testing durations with Owner’s input.
a. Durations will vary depending on the availability of water for testing.
b. Target minimum Functional Test duration: 8 hours.
(1) Identify equipment/system that cannot be tested for a minimum of 8 hours as specified in technical sections.
4. Perform Functional Testing as specified in technical sections.
a. Perform Functional Testing in addition to the other tests specified in the technical sections.
b. Perform Functional Testing to demonstrate that the component equipment functions as an entire system in accordance with the design requirements.
c. Perform Functional Testing to demonstrate that the unit process has operated in a manner necessary to demonstrate equipment/system functions manually in local, manually in remote (or remote manual), and automatically in remote (in remote auto).
d. Perform testing with Contractor-provided water.
e. Repair or replace parts that operate improperly and retest.
f. Submit testing results as specified in the technical sections to the Owner and Engineer for approval of Functional Testing results.
5. Provide completed Manufacturer’s Certificate of Installation and Functionality Compliance forms for all equipment.

a. Manufacturer's Certificate of Installation and Functionality Compliance form is included in this Section.
b. Manufacturer's Certificate of Installation and Functionality Compliance certifies the equipment/system meets the following requirements:
(1) Is suitable for satisfactory full-time operation under full-load conditions.
(2) Operates within the allowable limits for vibration and noise.
(3) Electrical and instrumentation requirements:
(a) Electrical equipment, instrumentation, and control panels are properly installed, calibrated, and functioning.
(b) Electrical Installation Testing is complete, and test results have been approved by the Engineer.
(i) Noted deficiencies have been corrected.
(ii) Relays, circuit breakers, and other protective devices are set.
(c) Control logic for start-up, shutdown, sequencing, interlocks, control, and emergency shutdown has been tested and is properly functioning.
(d) Motor control is calibrated and tested.

F. Closeout documentation:
1. Submittals:
a. Provide records generated during Commissioning Phase of Project.
(1) Required documents include but are not limited to:
(a) Training documentation.
(b) Manufacturer's Certificate of Source Testing.
(c) Manufacturer's Certificate of Installation and Functionality Compliance.
(d) Daily logs of equipment/system testing identifying tests conducted and outcome.
(e) Test forms and documentation.
(f) Functional Testing results.
(g) Logs of time spent by manufacturer's representatives performing services on the job site.
(h) Equipment lubrication records.
(i) Electrical phase, voltage, and amperage measurements.
(j) Insulation resistance measurements.
(k) Bearing temperature measurements.
(2) Data sheets of control loop testing including testing and calibration of instrumentation devices and setpoints. Format: 2 electronic copies and 3 hard copies organized in notebooks.
(3) Due date: Within 14 calendar days of Substantial Completion.

1.07 PROCESS START-UP PHASE

A. Overview of Process Start-Up Phase:
1. Operating the facility to verify performance meets the Contract Document requirements.
B. Process Start-Up:
1. Perform process start-up in the presence of the Engineer.
2. Pre-start-up activities:
a. Commissioning Documentation and Data Review.
b. Start-Up Go/No-Go Decision Criteria.
c. Building and Fire Inspection Compliance Check.

d. Process Start-Up Sequence Review.
    (1) Submit a Process Start-Up plan for review by Engineer not less than 90 calendar days prior to planned commencement of process start- up activities.
    (2) Include the following:
        (a) Pre-start-up activities.
        (b) Process Start-Up.
        (c) Process Operational Period.
e. Description of Temporary Testing Arrangement, if applicable.
f. Final Process Start-Up Forms and Documentations.
g. Final Operational Testing Plan.

3. Control loop tuning.
    a. Perform control loop tuning during system testing with water to the extent possible.
4. Process area start-ups.
    a. Process start-up individual process areas comprised of multiple interdependent systems where possible and beneficial to reduce complexity and risk of complete facility testing.
    b. Process area test flows may be limited by upstream and downstream process constraints (i.e., tank and basin volumes) and/or localized recirculation capabilities.
5. Facility-wide process start-up.
    a. Upon approved completion of pre-start-up activities, perform entire facility process start-up.
        (1) Complete control loop tuning during this phase of process start-up.
        (2) Continue process start-up operations until facility meets or exceeds the Contract requirements.
    b. Process control systems testing:
        (1) Test complete system instrumentation, controls and PLC, HMI, and LOI programming for the facility.
    c. HVAC systems start-up and testing:
        (1) Test complete HVAC system for the facility.
    d. Ancillary systems start-up and testing:
        (1) Test complete security system, phone system, fire alarm system, etc. for the facility.
    e. Remaining equipment/system tests:
        (1) Conduct remaining specified equipment/system performance tests that could not be performed during the Testing and Training Phase due to inter-system and/or treatment process dependencies.

C. Process Operational Period:
1. Prior to beginning the Process Operational Period:
    a. Conformance with treatment standards is required prior to Operational Testing, if applicable.
        (1) Biological processes require time to build up the necessary population of organisms to meet treatment standards, as specified in Section 01140 - Work Restrictions.
    b. Correct any outstanding punch list items prior to the Operational Testing.
2. Duration: 30 calendar days.
3. Engineer will be present for process operational period unless such presence is expressly waived in writing.
4. Prove facility conformance with Contract Document requirements.
5. Contractor to provide:
    a. Specified start-up materials and operating supplies.

b. Necessary craft of labor assistance, in the event of an emergency equipment failure requiring immediate attention (emergency is defined as a failure of function which precludes the further operation of a critical segment of or the whole of the Work) with a response time of not more than 4 hours from the time of notification.
c. Manufacturer's authorized representative to supervise placing equipment/systems in operation and provide guidance during Operational Testing per applicable section.
d. Necessary manufacturer's representatives and operating supplies for retesting systems that fail to pass the initial Operational Testing due to deficiencies in products of workmanship at no additional cost to the Owner.
e. List of 24-hour "on-call" representative supervisory persons who will monitor the Operational Testing and serve as liaison for the Engineer and Owner.

6. Owner will provide:
   a. Operations personnel for duration of test.
7. Prior to date of Substantial Completion of Installation, the Contractor's COMMISSIONING MANAGER shall oversee Process Operational Period.
   a. Owner staff will operate the completed Project construction.
   b. Entire system shall continuously meet performance requirements and shall operate without fault, failure, or defect for a continuous period.
   c. Individual equipment/system failures that are corrected within 24 hours and do not prevent the entire project from continuously satisfying the established operational requirements shall not require the consecutive day test to be restarted unless the failure recurs.
   d. Restart the consecutive test period for any of the following conditions:
      (1) Any failure of the complete Project construction to meet operational requirements.
      (2) When malfunctions or deficiencies cause shutdown or partial operation of the facility, or results in failure of the complete Project construction to meet operational requirements.
      (3) Any individual equipment/system failure that meets any of the following conditions:
         (a) Requires more than 24 hours to correct.
         (b) Recurs within the 24-hour correction period requiring further correction.
      (4) Immediately correct defects in material, workmanship, or equipment/system which became evident during Operational Testing.

1.08 INSTRUMENTATION AND CONTROLS FINE-TUNING

A. After the Process Operational Period, test PCIS system for additional 60 days.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

End of Section

MANUFACTURER'S CERTIFICATE OF SOURCE TESTING

OWNER_____ EQPT/SYSTEM_____
PROJECT NAME_____ EQPT TAG NO. _____
PROJECT NO._____ EQPT SERIAL NO. _____
SPECIFICATION NO. _____
SPECIFICATION TITLE _____

Comments: _____

_____

_____

_____

_____

I hereby certify Source Testing has been performed on the above-referenced equipment/system as defined in the Contract Documents, and results conform to the Contract Document requirements. Testing data is attached.

Date of Execution:_____, 20_____

Manufacturer: _____

Manufacturer's Authorized Representative Name *(print)*: _____

_____
(Authorized Signature)

If applicable, Witness Name *(print)*: _____

_____
(Witness Signature)

MANUFACTURER'S CERTIFICATE OF INSTALLATION AND FUNCTIONALITY COMPLIANCE

OWNER_____ EQPT/SYSTEM_____
PROJECT NAME_____ EQPT TAG NO. _____
PROJECT NO._____ EQPT SERIAL NO. _____
SPECIFICATION NO. _____
SPECIFICATION TITLE _____

I hereby certify that the above-referenced equipment/system has been: (Check Applicable)

- ☐ Installed in accordance with manufacturer's recommendations.
- ☐ Inspected, checked, and adjusted.
- ☐ Serviced with proper initial lubricants.
- ☐ Electrical/instrumentation and mechanical connections meet quality and safety standards.
- ☐ All applicable safety equipment has been properly installed.
- ☐ Functionally tested.
- ☐ System has been performance tested and meets or exceeds specified performance requirements.

NOTES:
Attach test results with collected data and test report.

Attach written certification report prepared by and signed by the electrical and/or instrumentation subcontractor.

Comments: _____

_____

I, the undersigned manufacturer's representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate this equipment/system, and (iii) authorized to make recommendations required to ensure that the equipment/system furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

Date:_____, 20 ____

Manufacturer: _____

Manufacturer's Authorized Representative Name *(print)*: _____

By Manufacturer's Authorized Representative: _____
(Authorized Signature)

COMMISSIONING

TRAINING EVALUATION FORM

EQUIPMENT/SYSTEM ITEM: _____

VENDOR/MANUFACTURER: _____

DATE: _____ NAME OF REPRESENTATIVE: _____

1.	Was representative prepared?	Acceptable	Unacceptable	or	N/A
2.	Was an overview description presented?	Acceptable	Unacceptable	or	N/A
3.	Were specific details presented for system components?	Acceptable	Unacceptable	or	N/A
4.	Were alarm and shutdown conditions clearly presented?	Acceptable	Unacceptable	or	N/A
5.	Were step-by-step procedures for starting, stopping, and troubleshooting presented?	Acceptable	Unacceptable	or	N/A
6.	Were routine/preventative maintenance items clearly identified?	Acceptable	Unacceptable	or	N/A
7.	Was the lubrication schedule (if any) discussed?	Acceptable	Unacceptable	or	N/A
8.	Was the representative able to answer all questions?	Acceptable	Unacceptable	or	N/A
9.	Did the representative agree to research and answer unanswered questions?	Acceptable	Unacceptable	or	N/A

10. Comments: _____

_____

_____

_____

11. Overall Rating: Satisfactory Unsatisfactory

Note:

Sessions judged “Unsatisfactory” by a majority of attendees shall be revised and conducted again until a satisfactory rating is achieved.

COMMISSIONING ROLES AND RESPONSIBILITIES MATRIX

NO.	TASK	OWNER	CONTRACTOR	ENGINEER
Testing and Training Phase				
Source Testing				
1	Source Testing	Witness	Lead	Witness, Review
Installation Testing				
2	Electrical Conductor Testing	No Action	Lead	Witness
3	Electrical Field Acceptance Tests	No Action	Lead	Witness
4	Instrument Field Calibration	No Action	Lead	Witness
5	Network Installation Testing	Witness	Lead	Witness
6	Loop Testing	Witness	Lead	Witness
7	Pressure Testing	No Action	Lead	Witness
8	Leak Testing	No Action	Lead	Witness
9	Holiday Testing	No Action	Lead	Witness
10	HVAC Testing	No Action	Lead	Witness
11	Motor Electrical Testing	No Action	Lead	Witness
Functional Testing				
12	Network Operational Testing	Witness	Lead	Review
13	Preliminary Run Testing Local/Manual Control	Witness	Lead	Review
14	PCIS Functional Demonstration Testing - Local/Auto Control Testing - Remote/Manual Contact Testing - Alarm Testing - Control Loop Testing	No Action	Lead	Review
15	Subsystem Start-Up and Testing	Witness	Lead	Review
16	Equipment/System Start-Up and Testing	Witness	Lead	Review
17	HVAC Start-Up and Testing	Witness	Lead	Review
18	Corrosion Control Start-Up and Testing	Witness	Lead	Review
19	Wide Area Network Communications Testing	Support	Lead	Witness
20	Manufacturer's Certificate of Installation and Functionality Compliance	No Action	Lead	Witness, Review
Clean Water Facility Testing				
21	Test Water Management Plan Finalization	Support	Lead	Review
22	Clean Water Facility Testing	Witness	Lead	Witness, Review
Process Start-Up Phase				
Process Start-Up				
23	Commissioning Documentation and Data Review	Review	Support	Lead
24	Start-Up Go/No-Go Decision Criteria	Lead	Support	Review
25	Building and Fire Inspection Compliance Check	No Action	Lead	Witness

NO.	TASK	OWNER	CONTRACTOR	ENGINEER
Testing and Training Phase				
26	HVAC Functionality Check	No Action	Lead	Witness
27	Start-Up Sequence Review	Support	Lead	Review
28	Temporary Testing Arrangement Finalization	Support	Lead	Support
29	Start-Up Forms Finalization	Support	Lead	Support
30	Operation Testing Plan Finalization	Review	Support	Lead
31	Test Water Management Plan Finalization	Support	Lead	Review
32	System Testing	Support	Lead	Witness
33	Control Loop Tuning	Support	Lead	Witness
34	Process Area Start-Ups	Support	Lead	Witness
35	Facility-Wide Start-Up	Support	Lead	Witness
36	Process Control Systems Testing	Support	Lead	Witness
38	HVAC Final Testing, Adjust, and Balancing	Witness	Lead	Witness, Review
Process Operational Period				
39	Operational Testing	Support	Lead	Witness, Review
40	Final Testing Reports	Support	Lead	Review
41	Water Quality Testing and Documentation	Support	Lead	Review
Instrumentation and Controls Reliability Phase				
Instrumentation and Controls Reliability Period				
42	As specified in Section 15950 - Testing, Calibration, and Commissioning			

Legend:
Lead: Primarily responsible for organization, coordination, and execution of task work product or result.
Support: Assist the lead with organization, coordination, and execution of task work product or result.
Witness: Observe and document completion of task work product or result.
Review: As necessary to accept task work product result.
No Action: Limited or no involvement.

1 July 2024 KIPPER, BRIAN 1:1 KCWATER22.CTB C:\USERS\BKIPPER\ONEDRIVE – CITY OF KANSAS CITY\DESKTOP\SAACS TUNNEL\23ACADPLANT07012024.DWG

PROJECT LEGEND

P.G. - Pipe Gallery

D.B. - Direct Buried

Hydrant Replacement

Valve Replacement

Valve Assessment & Repair/Replace deficient valves

Replacement

Video Inspection

Condition Assessment & Repair/Replace areas that are deficient

Condition Assessment & Repair/Replacement of Sludge House Discharge Piping

Condition Assessment & Replacement of Flush Lines to Sludge House

MAINTENANCE BUILDING

Chemical Building Modifications

CHEMICAL BUILDING

1-A 1-B 2-A 2-B 3-A 3-B SECONDARY SETTLING BASINS

HYDRANTS MOUNTED FLUSH WITH WALKWAY

1-A 1-B 2-A 2-B FINAL SETTLING BASINS

3 FINAL SETTLING BASINS

PRIMARY SETTLING BASIN 6

PRIMARY SETTLING BASIN 4

PRIMARY SETTLING BASIN 2

PRIMARY SETTLING BASIN 5

PRIMARY SETTLING BASIN 3

PRIMARY SETTLING BASIN 1

Valve Chamber Modifications

A B C FILTER BUILDINGS

AVONDALE SUBSTATION

CHLORINE BLDG

SECONDARY PUMP STATION

7 MILLION GALLON RESERVOIR

22 MILLION GALLON

TOWER

SCADA CNTRL

LABORATORY

TRANSMISSION MAIN

VENTURI VAULT

90° DOWNSHAFT TRANSMISSION MAIN

MISSOURI VALLEY DOWNSHAFT CHAMBER

INTAKE & PUMP STATION

ABANDONED LOW-LIFT STATION

60" PLANT MAIN LS

72" PLANT MAIN LS

78" PLANT MAIN LS

MCS/ SUBSTA

FEED TO CHILDREN'S FOUNTAIN

100 0 100 200

SCALE IN FEET

PROFESSIONAL ENGINEER SEAL	KANSAS CITY, MISSOURI, WATER SERVICES DEPARTMENT
	BRIARCLIFF WTP
	HOUSE SERVICE MAINS
	KANSAS CITY, CLAY COUNTY, MISSOURI
FOR WSD USE:	PLAN VIEW

DRAWN BY	CHECKED BY	MAP NO.	RANGE	TWP	SEC
Drawn	IG	MAPNO	RNG	TWP	SEC

CONTRACTOR	DATE COMPLETED
CONTRACTOR	mm/dd/yyyy

CONTRACT NO.	DRAWING SUBMITTED	FAC/WME/WO#	DRAWING NO.
CCN	7-07-2024	###	D12345

PROJECT NO. 80001234 SHEET XX OF XX

Legend

Demolish Pipe. As applicalbe it will be purged and free of gases before removal.

Demolish Pipe. Contractor shall'inspect demolishedd Ductile Iron Pipe, if identified to be suitable by both Contractor and City it may be re-installed for use.

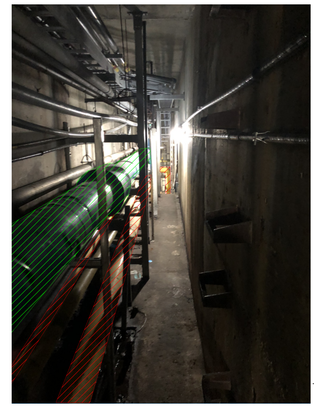
Valves shall be reused in the new 8" Ductile Iron Main.

1 DETAIL 1
SCALE: N.T.S.

2 DETAIL 2
SCALE: N.T.S.

3 DETAIL 3
SCALE: N.T.S.

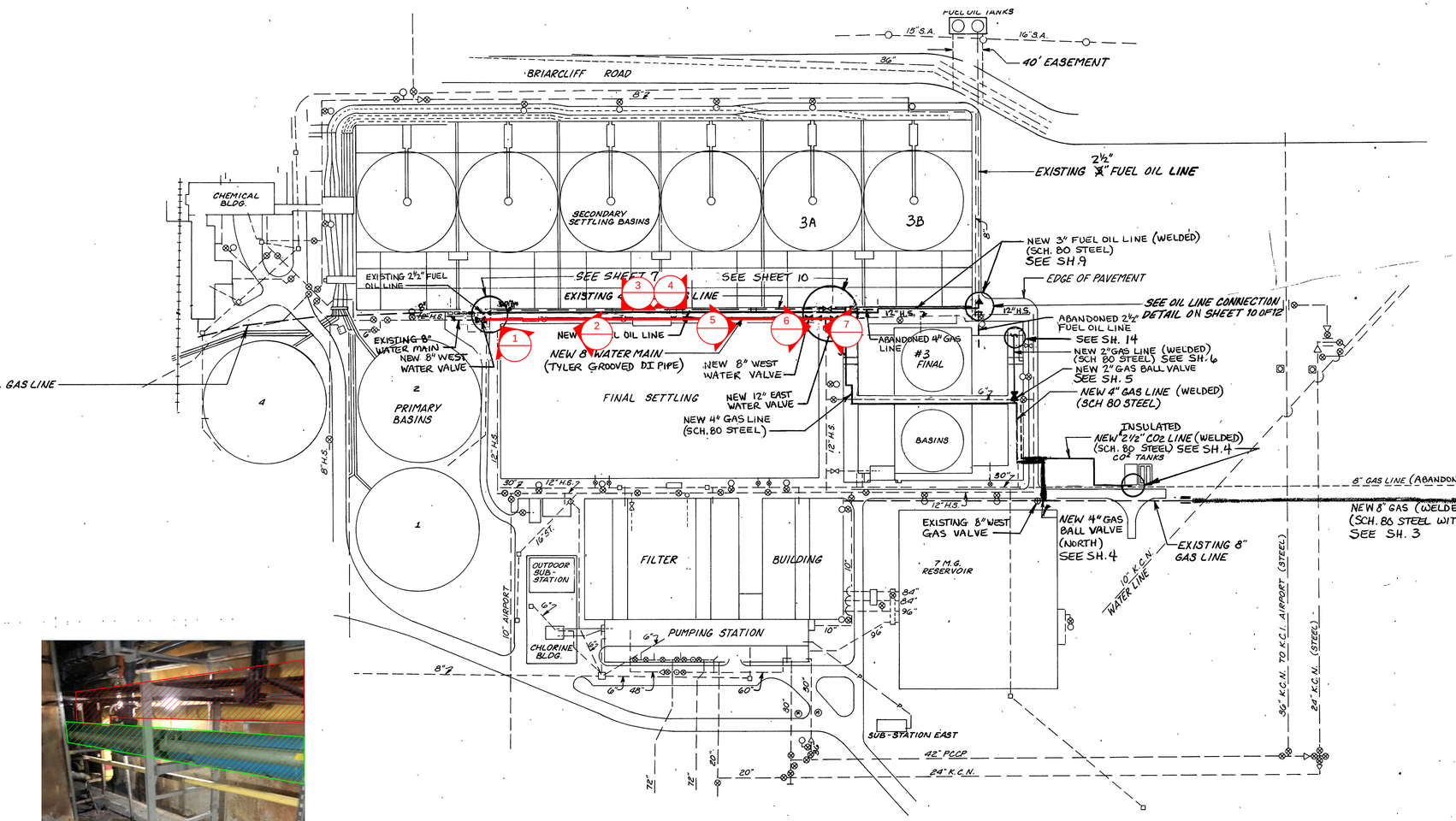
4 DETAIL 4
SCALE: N.T.S.



5 DETAIL 5
SCALE: N.T.S.

6 DETAIL 6
SCALE: N.T.S.

7 DETAIL 7
SCALE: N.T.S.



E-2520 SEC. 11 TP. 50 R. 33 C-24A

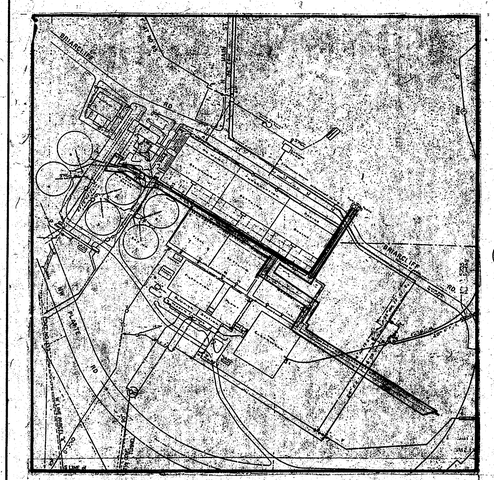
MICROFILMED

K&E 19-1253 30369

REHABILITATION OF NATURAL GAS, FUEL OIL, WATER AND CARBON DIOXIDE PIPING AT THE WATER TREATMENT PLANT

KANSAS CITY, CLAY CO., MISSOURI

LOCATION MAP



SHADED AREA INDICATES ROUTE OF PIPING

WATER AND POLLUTION CONTROL DEPARTMENT
ENGINEERING SERVICES

GENERAL NOTES

1. THE LOCATION OF EXISTING UTILITIES AS SHOWN IS APPROXIMATE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, TO VERIFY THE LOCATION OF ALL EXISTING UTILITIES.
2. WHEN THE VALVE OPERATING NUT IS MORE THAN 3' BELOW THE VALVE COVER, THE CONTRACTOR SHALL FURNISH AND INSTALL A VALVE OPERATING NUT EXTENSION, AS PER WATER DEPARTMENT SPECIFICATIONS.
3. ALL HYDRANT SETS ARE TO BE MADE WITH RETAINER GLANDS OR ANCHORING FITTINGS.
4. THE CONTRACTOR SHALL FURNISH, AT NO EXTRA COST, ANY BENDS OR FITTINGS NECESSARY TO MAKE PROPER HORIZONTAL OR VERTICAL ALIGNMENT FOR CONNECTIONS TO EXISTING LINES. FOR HORIZONTAL DEFLECTIONS, THE CONTRACTOR MAY AT HIS OPTION, USE SHORT LENGTHS OF PIPE IN LIEU OF BENDS.
5. ALL MAINS, VALVES AND FITTINGS SHALL BE POLYETHYLENE ENCASED FOR THE FULL LENGTH OF THE PROJECT IN ACCORDANCE WITH THE KANSAS CITY, MISSOURI STANDARDS AND SPECIFICATIONS FOR "POLYETHYLENE ENCASEMENT FOR DUCTILE IRON AND CAST IRON PIPE."
6. ALL ANODES SHALL BE 17 LB. MAGNESIUM ANODES.

STATE OF MISSOURI
DAMON ALLEN LEWIS
NUMBER E-19824
REGISTERED PROFESSIONAL ENGINEER

APPROVED Roy Jackson 6/25/90
ROY L. JACKSON, DIRECTOR DATE

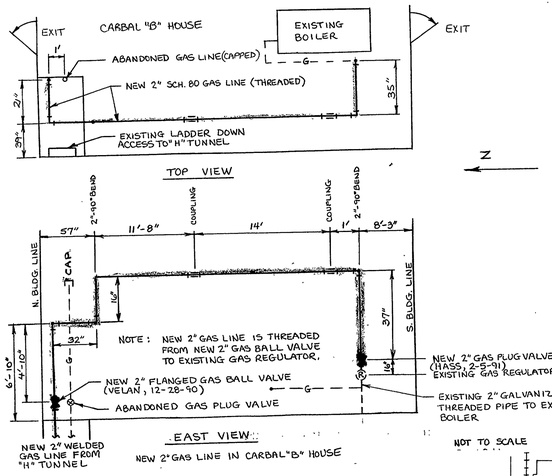
REHABILITATION
OF
NATURAL GAS, FUEL OIL, WATER
AND
CARBON DIOXIDE PIPING
AT THE
WATER TREATMENT PLANT

D-16841

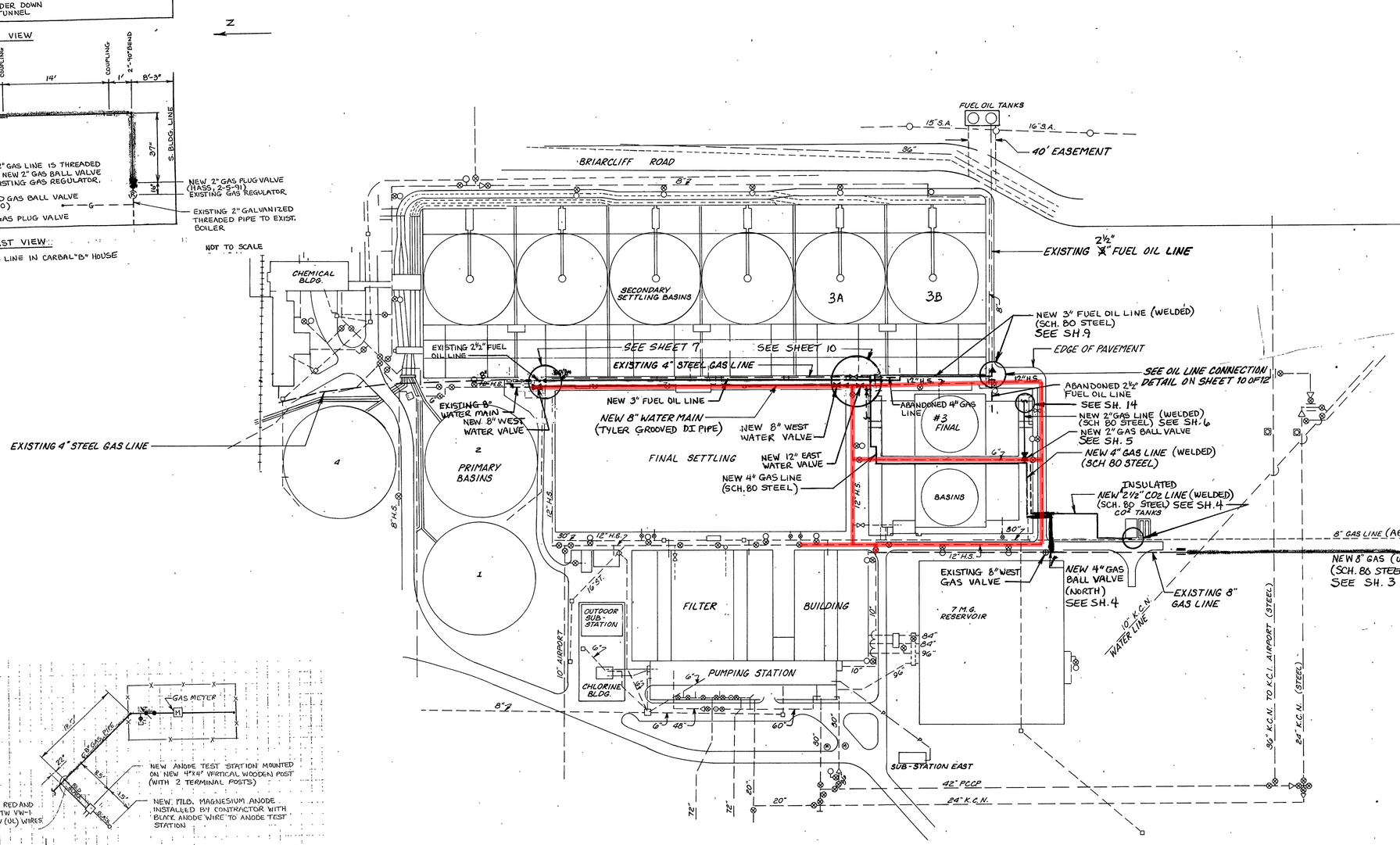
E-2520 SEC. 11 TP. 50 R. 33 C-24A

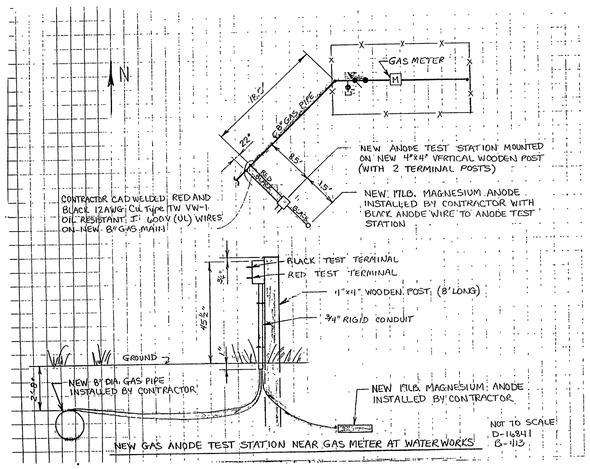
12

MICROFILMED



NOT TO SCALE





STATE OF MISSOURI
REGISTERED PROFESSIONAL ENGINEER
DAMON ALLEN LEWIS
NUMBER E-19824

NO	DATE	BY	NATURE

REVISIONS

REHABILITATION OF
NATURAL GAS, FUEL OIL, WATER AND CARBON DIOXIDE PIPING AT THE WATER TREATMENT PLANT
WATER & POLLUTION CONTROL DEPARTMENT ENGINEERING SERVICES
CITY OF KANSAS CITY, MISSOURI
DRAWING NO. 16841
DESIGNED BY D. LEWIS APPROVED BY MA ALMAI
DETAILED BY J. CALZARANO DATE
2 OF 12

E-2520 SEC. 11 TP. 50 R. 33 C-24A

MICROFILMED

517421

PLAN | SURVEYED | PLOTTED | ALIGNMENT CHECKED | BY | DATE | NOTE BOOK | ALL DIM. CHECKED | NO. | BY DIV. WAY CHECKED

PROFILE | SURVEYED | PLOTTED | ALIGNMENT CHECKED | BY | DATE | NOTE BOOK | B.M. NOTED | NO. | STRUCTURE NOTES CH'KD.

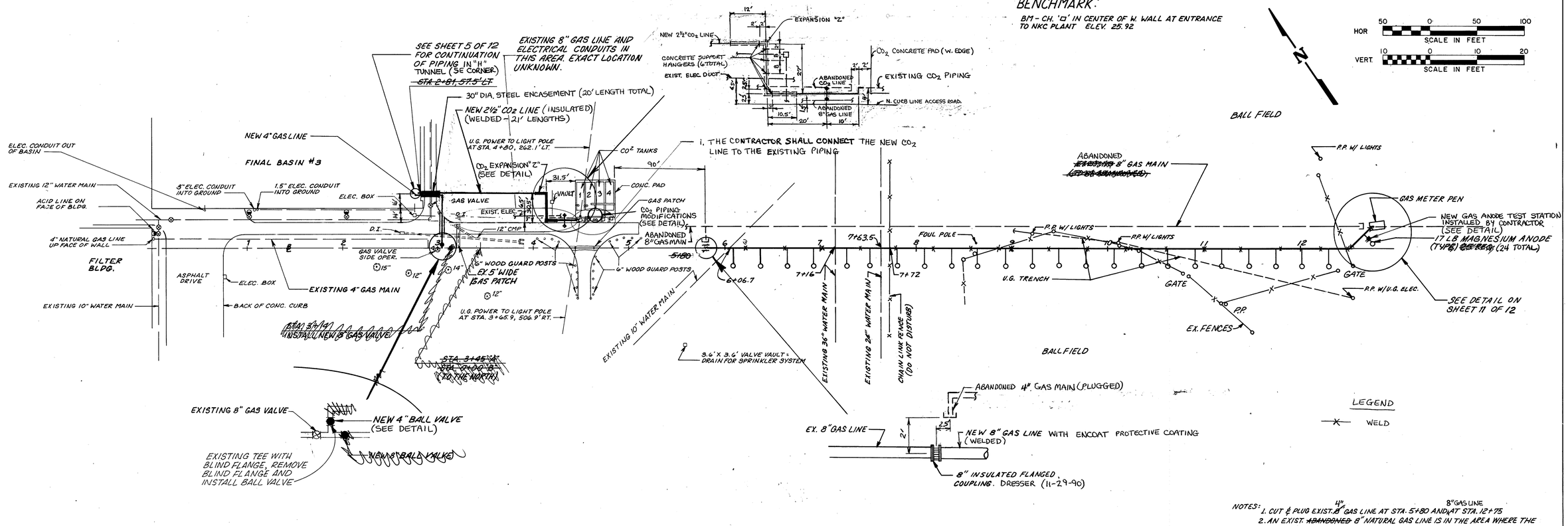
BENCHMARK:

BM - CH. 'D' IN CENTER OF W. WALL AT ENTRANCE TO NKC PLANT ELEV. 25.92

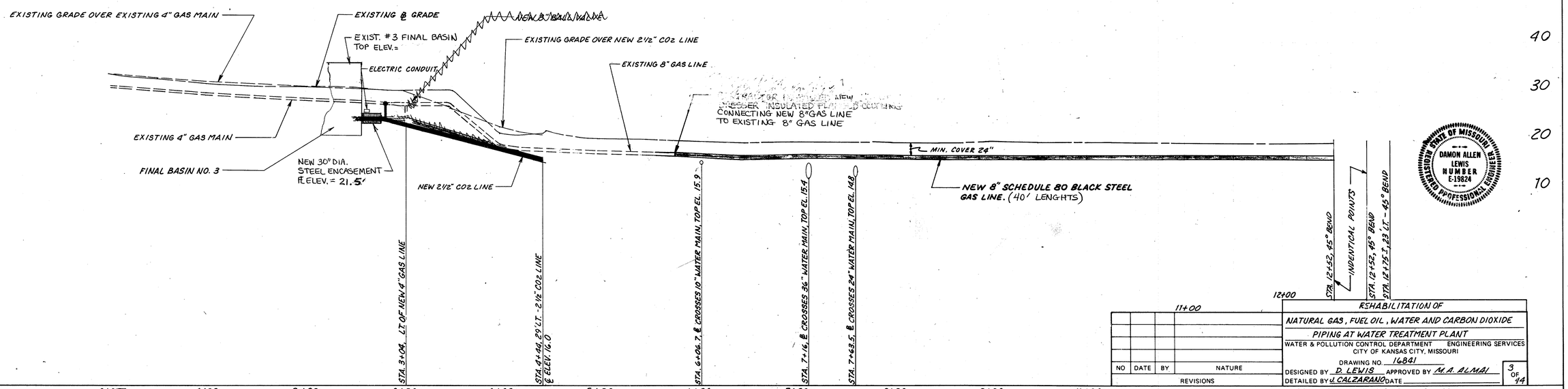
HOR 50 0 50 100 SCALE IN FEET

VERT. 10 0 10 20 SCALE IN FEET

N



NOTES:
1. CUT & PLUG EXIST. ~~8~~ GAS LINE AT STA. 5+80 AND AT STA. 12+75
2. AN EXIST. ~~ABANDONED~~ 8" NATURAL GAS LINE IS IN THE AREA WHERE THE NEW 2½ CO_2 LINE IS TO BE LAID. UNKNOWN DEPTH AND ALIGNMENT.
3. THE NEW 8" STEEL GAS LINE SHALL HAVE A MINIMUM COVER OF 24-INCHES.
4. THE EXISTING 8" GAS MAIN TO BE ABANDONED SHALL BE PURGED WITH CO_2 AND PLUGGED.
5. THE WATER AND POLLUTION CONTROL DEPARTMENT WILL MAKE THE CO_2 AVAILABLE TO THE CONTRACTOR AT THE CO_2 TANKS. THE CONTRACTOR SHALL FURNISH ALL NECESSARY PIPING AND OTHER FACILITIES NEEDED TO PURGE THE MAIN.



STATE OF MISSOURI — REGISTERED PROFESSIONAL ENGINEER — DAMON ALLEN LEWIS NUMBER E-19824

NO	DATE	BY	NATURE
REVISIONS			

REHABILITATION OF
NATURAL GAS, FUEL OIL, WATER AND CARBON DIOXIDE
PIPING AT WATER TREATMENT PLANT
WATER & POLLUTION CONTROL DEPARTMENT ENGINEERING SERVICES
CITY OF KANSAS CITY, MISSOURI
DRAWING NO. 16841
DESIGNED BY D. LEWIS APPROVED BY M.A. ALMAI
DETAILED BY J. CALZARANO DATE
3 OF 14

E-2520 SEC. 11 TP. 50 R. 33 C-24A

MICROFILMED

HOR 20 0 20 40 SCALE IN FEET

VERT 10 0 10 20 SCALE IN FEET

N

S CURBLINE DRIVE

7.5' 4" 4"

90° BEND 90° BEND

2.5' WELD 8"x4" REDUCER 8" GAS VALVE, SIDE OPERATING

2.5' 1.5' WELD 8" PLUGGED TEE (REMOVED PLUG TO INSTALL NEW 4" GAS MAIN)

EXIST. 8" 2'

EXISTING GAS LINE 2.7' BELOW GRADE

DROP INLET

ELEC. BOX

EX. 8" GAS MAIN

SEE SHEET 5 OF 12 FOR CONTINUATION OF PIPING

EX. 6" WATER MAIN

3 ELEC. CONDUIT GOING U.G.

BRICK BUILDING

ELEC. DUCT BANK

EX. HYDRANT

WATER SERVICE

NEW 4" GAS LINE (SEE DETAIL)

EX. GAS VALVE

~~STA. 0+00 - B "B"~~
~~STA. 3+46 - B "A"~~
~~INSTALL NEW 4" BALL VALVE (VELAN)~~

TRENCH LINE IN ASPHALT DRIVE

ASPHALT DRIVE W/ CONC. CURBS

EX. 12" WATER MAIN

THIS SECTION MUST BE TUNNELED IN ACCORDANCE TO THE SPECIFICATIONS. CONTRACTOR BORED (2-10' LONG) 30" DIA. STEEL PIPE TO BASIN WALL LAID PIPING AND FILLED ENCASEMENT WITH CONCRETE.

DROP INLET

~~INSTALL NEW 8" BALL VALVE~~

~~30" STEEL ENCASEMENT~~

SEE SHEET 10 OF 12 FOR DETAILS

U.G. ELEC. CONDUIT

NEW 2½" CO_2 SCH. 80 BLACK STEEL PIPING (WELDED) INSULATED WITH FOAMGLAS, PITTWRAP JACKETING

B 1 2 3 B

12"

~~STA. 1+56.8 63.8' RT~~

133.5'

12" CMP

~~THIS SECTION SHALL BE INSTALLED AS FOLLOWS:~~

~~1. OPEN CUT THE TRENCH~~
~~2. CUT THE 30" STEEL ENCAS. IN HALF~~
~~3. SET THE NEW PIPING IN THE BOTTOM HALF ENCAS. AND DOUBLE WRAP THE PIPING WITH POLYETHLENE~~
~~4. SET THE TOP HALF OF THE ENCAS. ON THE BOTTOM HALF AND TIED WELD IN PLACE~~
~~5. WELD SHALL BE ¼" BEVELED FILLET ON THE EXTERIOR ONLY~~
~~6. SEAL BOTH ENDS OF THE ENCAS. WITH DRY BRICK.~~

~~SEE SHEET 3 OF 12 FOR CONTINUATION OF PIPING~~

4

BASELINE ± EX. 8" GAS LINE

NEW CO_2 EXPANSION "Z" (SEE DETAIL) AND SHEET 12 OF 15 FOR DETAILS

SEE SHEET 3 OF 12 FOR CONTINUATION OF PIPING

N

EXIST. CO_2 TANK #3

VAPOR LINE 1" DIA. FLOW

1½" DIA. FLOW LIQUID LINE

CAPPED OUTLET (1") HOSE CONNECTION

CAPPED INLET (1½") HOSE CONNECTION

8" 4" 1" 32"

EXIST. 90° BENDS

NEW SCH. 80 BLACK STEEL CO_2 PIPE (THREADED)

1½" DIA. 1" DIA.

EXIST. CO_2 TANK #2

TOP VIEW

N

#3 FINAL BASIN SE CORNER

ASPHALT DRIVE

EXIST. 8" (GAS) WEST VALVE

4" G

12" CMP

ABAND. CO_2

ASPHALT DRIVE

NEW 4" GAS MAIN

NEW 2½" CO_2 PIPE FROM CO_2 TANKS

8" G

NEW 4" (GAS) NORTH VALVE (VELAN 12-12-90) 36' S/S LINE #3 FINAL BASIN WALL 23' E/E LINE #3 FINAL BASIN WALL

PLAN VIEW

#3 FINAL BASIN

CO_2 ACCESS ROAD

PROFILE VIEW SCALE: 1"=60'

N

4" GAS

8"x4" REDUCER 8"x8" CROSS W/PLUG 4"

4" GAS BALL VALVE

4" FLANGE

8" FLANGES - 1 NEW, 1 EXIST.

8" GAS

EXIST. 8" GAS VALVE

8"x8"x8" TEE

2.5' 1.5'

SECTION A-A

NEW 4" GAS LINE, SCH. 80 IN "H" TUNNEL

165'

7.5' 24' 20' 30" DIA.

#3 FINAL SETTLING BASIN

NEW 30" DIA. STEEL ENCASEMENT, 20' LENGTH CONCRETE THROUGHOUT INTERIOR

NEW 2½" CO_2 LINE, SCH. 80 W/ INSULATION (FOAMGLAS)

12' 31.5' 40'x42' CONCRETE CO_2 PAD

EXPANSION "Z"

SE CORNER #3 FINAL SETTLING BASIN WALL

4" GAS

4" NORTH BALL VALVE (VELAN, 12-12-90) 36' SOUTH OF SOUTH BASIN WALL #3F 23' EAST OF EAST BASIN WALL #3F

8" WEST GAS VALVE (EXISTING) 41' SOUTH OF SOUTH BASIN WALL #3F 20' EAST OF EAST BASIN WALL #3F

16' 41' 2.5' 10.5' 27' 12' 2'

4" G A A G 8"

TOP VIEW

NEW 4"GAS + 2½" CO_2 LINES NOT TO SCALE

NEW 1½" + 1" SCH. 80 BLACK STEEL PIPE (THREADED)

EXIST. 1½"-90° BEND

EXIST. 1"-90° BENDS

EXIST. 1" DIA. CO_2 PIPE (THREADED)

EXIST. 1½" DIA. CO_2 (THREADED)

NEW 1/2" SAFETY POP / NEW 1½"x1" TEE

NEW 1/2" SAFETY POP / NEW 1"x1" TEE

EXIST. UNION

EXIST. UNION

CO_2 TANKS

NEW 1" MC CANNA BALL VALVE (SHUT-OFF)

NEW 1"x1" TEE

FLOW

6" 5" 4"

EXIST. CAP (1") BLEED-OFF

NEW ¾" GEMINI BALL VALVE (BLEED-OFF TO ATMOSPHERE)

NEW ¾"-90° BEND

NEW 1½" MC CANNA BALL VALVE (SHUT-OFF)

EXIST. CAP / EXIST. 1½"x1½" TEE

EXIST. 1" JAMESBURY VALVE (BLEED-OFF TO ATMOSPHERE)

EXIST. 1"-90° BEND

52" 37" 33"

6.5" 5.5" 4"

EXIST. 1½"-90° BEND

EXIST. 1"-90° BEND

CO_2 CONCRETE PAD

13'-3"

SIDE VIEW

CO_2 ACCESS ROAD

N. CURB LINE

MODIFICATIONS TO EXISTING CO_2 LINES AT CO_2 TANKS - WATER WORKS

NOT TO SCALE

STATE OF MISSOURI REGISTERED PROFESSIONAL ENGINEER DAMON ALLEN LEWIS NUMBER E-19824

~~3+00~~

NO	DATE	BY	NATURE
			REVISIONS

REHABILITATION OF
NATURAL GAS, FUEL OIL, WATER AND CARBON DIOXIDE PIPING AT THE WATER TREATMENT PLANT
WATER & POLLUTION CONTROL DEPARTMENT ENGINEERING SERVICES
CITY OF KANSAS CITY, MISSOURI

DRAWING NO. 16841

DESIGNED BY D LEWIS APPROVED BY MA ALMAI

DETAILED BY J CALZARANO DATE

4 OF 14

E-2520 SEC. 11 TP 50 R. 33 C-24A

PLAN / PROFILE — SURVEYED, PLOTTED, CHECKED, NOTE BOOK, FINAL NOTED, CHECKED, NO, BY, DATE

MICROFILMED

EXISTING TUNNEL SECTIONAL PLANS

@ ELEV. 22.0'
PLAN SCALE 1"=10'-0"

MATCH LINE 1

MATCH LINE 2

4"-90° BEND (RIGHT)
4"-90° BEND (LEFT)
4"-45° BEND (UP)
9'-8"
33'
32"
12.5'
34"
HEATER W/THERMOSTAT
1½" ELECTRICAL CONDUIT '93'
2" CONDENSATE LINE TO CONDENSATE TANK
3" STEAM LINE
EXISTING ELECTRICAL CONDUITS
2" CONDENSATE TO THE CHEMICAL BLDG.
EXIT UP
CONDENSATE TANK AND RETURN PUMP
SLUDGE PUMPS AND SUMP
DOWN
43'
115'
3" STEAM LINE
ELECTRICAL CONDUITS
EXPANSION JOINTS WITH ALIGNMENT GUIDES ON CONDENSATE & STEAM LINE
2" CONDENSATE LINE UNDER 3" STEAM LINE
4"-90° BEND
NEW 2" GAS PIPE SCH. 80 (WELDED)
12'
13.5'
7'
5.5
17'
2" CONDENSATE UNDER 3" STEAM LINE
EXPANSION JOINTS WITH ALIGNMENT GUIDES ON TWO CONDENSATE LINES & STEAM LINE
1½" ELECTRICAL CONDUIT
1½" ELECTRICAL CONDUIT
2-2"-90° BENDS
NEW 2" NORTH GAS BALL VALVE
4"-90° BEND
4"-90° BEND
2-4"-90° BENDS
HEATER
NATURAL GAS LINE
CO_2 LINE
THERMOSTAT
EXISTING 8" WATER MAIN
PIPE TRAY
EXPANSION JOINT W/ALIGNMENT GUIDES
12" DRAIN
TUNNEL WALL
ELECTRICAL CONDUITS
PVC LINES
EXISTING STEAM LINE
COLUMNS
17'
1½" CONDENSATE & ELECTRICAL CONDUIT
1¼" ELECTRICAL CONDUIT
"C" HOUSE
1½" CONDENSATE LINE @ EL. 31.00

SECTION
NO SCALE
1/6

CEILING OF "H" TUNNEL (N-S) WALKWAY
7'-6"
4"
2½"
NEW 4" GAS PIPE
4"-90° BEND
12'
26"
9"
CEILING CENTER "H" TUNNEL (E-W)
NEW 4" GAS PIPE
7'
EAST 7' ANGLE WALL
3½" 2" WELDOLET FOR NEW 2" GAS PIPE
66¾" CLEARANCE
4"-90° BEND
2-4"-90° BENDS
5'
1'-2"
REMOVABLE STEPS
42"
TUNNEL FLOOR

SECTION
SCALE ½"=1'-0"
2/6

1'-2"
5'-0"
1'-2"
10'-0"
2 EXIST. 6" O.D. STEAM PIPES
1'-2"
EXIST. 1" CONDUIT (HEATERS)
EXIST. ¾" PIPE WITH DRIP LEG (HEATERS)
20½"
17"
6½"
UNIT HEATER
18¼"
1½" ELECT. CONDUIT
2" CONDENSATE @ EL. 23.55
4" O.D. CONDENSATE RETURN
NEW 4" GAS PIPE
NEW 2½" CO_2 PIPE
9" O.D. PIPE
13" O.D. PIPE
32"
78"
6'
11'-0"
TUNNEL SIDEWALK

SECTION
SCALE ½"=1'-0"
2/6

EXPANSION JOINT
TUNNEL WALL
1½" CONDENSATE
SEE SHEET 14 OF 12 FOR CONTINUATION OF PIPING IN 30" ENCASEMENT
2/6
2/6
60'
18.75'
32" STEAM LINE @ EL. 31.00
1" CONDENSATE LINE
#3 FINAL SOUTH WALL (EXTERIOR)
1½" ELECTRICAL CONDUIT
COLUMNS
HEATER
THERMOSTAT
NEW 4" GAS LINE
EXISTING CO_2 LINE
TUNNEL WALL
110'

ABANDONED 3" CONDENSATE REMOVED BY CONTRACTOR
1" ELECTRICAL CONDUIT
1½" ELECTRICAL CONDUIT
1¾" ELECTRICAL CONDUIT
1½" ELECTRICAL CONDUIT
3" STEAM LINE
NEW 4" GAS LINE
2" CONDENSATE LINE
37"
17'
5'

SECTION
SCALE ½"=1'-0"
3/6

℄ 4" GAS PIPE WITH 3½"-2" WELDOLET
CEILING OF "H" TUNNEL (N-S)
NEW 2" GAS PIPE
0.8'
1.4'
0.8'
1'
4'-7½"
CEILING OF CENTER "H" TUNNEL (E-W)
2-2"-90° BENDS
NEW 2" NORTH FLANGED GAS BALL VALVE (VELAN)
0.5'
2.5'
4"-90° BEND
3-4"-90° BENDS
35"
9"
66¾" CLEARANCE
3'
42"
REMOVABLE STEPS OVER EXISTING PIPING
℄ FLOOR OF TUNNEL

SECTION
NO SCALE
4/6

STATE OF MISSOURI
DAMON ALLEN LEWIS
NUMBER E-19824
REGISTERED PROFESSIONAL ENGINEER

NO	DATE	BY	NATURE

REVISIONS

REHABILITATION OF 4" GAS - CO_2
NATURAL GAS, FUEL OIL, WATER AND CARBON DIOXIDE
PIPING AT THE WATER TREATMENT PLANT
PLAN - FINAL NO. 3
WATER & POLLUTION CONTROL DEPARTMENT ENGINEERING SERVICES
CITY OF KANSAS CITY, MISSOURI
DRAWING NO 16631
DESIGNED BY D. LEWIS APPROVED BY M.A. ALMAI
DETAILED BY B.L.W.C.U.D.C. DATE
5 OF 14

E-2520 SEC. 11 TP. 52 R. 33 C-24A

MICROFILMED

N

2-4"-90° BDS
4" FLANGES
SEE SHEET 10
4"-90° BEND (UP)
11'-4"
4"-45° BEND
4"-45° BEND
1" ELECTRICAL CONDUIT
4" STEAM LINE
1" CONDENSATE LINE
17'
℄ EL. 31.00
CHAIN DRIVES
"A" HOUSE
1½" CONDENSATE LINE
COLUMNS
NATURAL GAS LINE (TO BE ABANDONED)
CO_2 LINE
PVC LINES
EXISTING STEAM LINE
HEATER
EXPANSION JOINTS
TUNNEL WALKWAY
EXISTING 8" WATER MAIN SLUDGE LINE
ELECTRICAL CONDUITS
4"-90° BEND
CHEMICAL LINES
PIPE TRAY
12" DRAIN
TUNNEL WALL
4"-90° BEND
MATCH LINE 1
NEW 4" GAS MAIN SCH. 80 (WELDED)
ELECTRICAL CONDUITS
EXISTING STEAM LINE
STEPS
TUNNEL WALL
NEW 4" GAS LINE
CONDENSATE LINES
4"-45° BEND

1'-2" | 10'-0" | 1'-2" | 5'-0" | 1'-2"
ELEV. 26'-6"
ELEV. 27'-8"
ELECTRICAL CONDUITS
SULFATE
CHEMICAL
ELEC. CONDUITS
CO_2 LINE
NATURAL GAS
PVC LINES
UNIT HEATER
TRAY
EXISTING STEAM LINE ℄ EL. 24.42
CONDENSATE ℄ EL. 23.53
℄ EL. 22.80
32"
NEW 4" GAS LINE
12" DRAIN
CEMENT COLUMNS
TUNNEL WALKWAY
ELEV. 20'-8"
6'-0"
1'-0"
6"
5'

SECTION
SCALE: ½" = 1'-0"
1/7

CEILING
56½"
4" GAS
2'
4"-90° BEND
4"-45° BEND (UP)

ENTRANCE AND EXIT
NEW 4" GAS MAIN
MATCH LINE 1
1" ELECTRICAL CONDUIT LINE
UP
DOWN
DOWN
SLUDGE PUMPS AND SUMP

NEW 2" GAS LINE TO BOILER (THREADED)
NEW 2" FLANGED BALL VALVE (VELAN)
FLANGE
CARBAL "A" HOUSE FLOOR
NEW 2" GAS (WELDED)
LADDER
2'-90° BEND
2'-90° BEND (UP)
TUNNEL WALKWAY
EAST TUNNEL WALL
CHAIN DRIVES

1'-2" | 5'-0" | 1'-2" | 10'-0" | 1'-2"
1½" ELEC. CONDUIT
NEW 2" GAS LINE
2" CONDENSATE ℄ EL. 23.55
UNIT HEATER
8" STEAM LINE
TUNNEL WALKWAY
1'-0"

SECTION
SCALE: ½" = 1'-0"
2/7

2" STEAM LINE
1" ELECTRICAL CONDUIT
2"-90° BEND (UP) SEE DETAIL
1" CONDENSATE LINE
1½" CONDENSATE LINE
NEW 2" GAS LINE EXIT UP TO "B" HOUSE
17' | 17'
2"-90° BD
2"-45° BD
"B" HOUSE
COLUMNS
THERMOSTAT
HEATER
NEW 2" GAS LINE SCH. 80 BLACK STEEL (WELDED)
STEPS
TUNNEL WALL
MATCH LINE 2
1" CONDENSATE RETURN LINE 2-2"-90° BENDS
1" ELECTRICAL CONDUIT
NEW 2" GAS BALL VALVE VELAN (FLANGED)
4" GASLINE
14"
7"
12"

STATE OF MISSOURI
DAMON ALLEN LEWIS
NUMBER E-19824
REGISTERED PROFESSIONAL ENGINEER

EXISTING TUNNEL SECTIONAL PLANS

@ ELEV. 22.0'
PLAN SCALE: 1" = 10'-0"

NO	DATE	BY	NATURE
			REVISIONS

REHABILITATION OF
NATURAL GAS, FUEL OIL, WATER AND CARBON DIOXIDE
PIPING AT THE WATER TREATMENT PLANT
PLAN - FINAL NO. 3
WATER & POLLUTION CONTROL DEPARTMENT ENGINEERING SERVICES
CITY OF KANSAS CITY, MISSOURI
DRAWING NO. 16841
DESIGNED BY D.C.LEWIS APPROVED BY M.A. ALMAI
DETAILED BY B.C.W.&P.C. DATE
6 OF 14
E-2520 SEC. 11 TP. 50 R. 33 P/L C-24A

MICROFILMED

8" VALVE TO BE REMOVED & REPLACED CLOW (4-24-91)

18' (TYP.)

CARBON LINE

EXISTING 4" NATURAL GAS LINE

CARBON LINE

MATCH LINE 1 STA. 0+59.75

N

NEW 2" COPPER PIPE

NEW 8" VALVE, CLOW (4-24-91)

ELECTRICAL CONDUITS

PIPE TRAY

NEW 3" FUEL OIL LINE

1" PVC POLYPHOSPHATE SOLUTION

1½" STEAM LINE

2" STEAM LINE

1" ELECTRICAL CONDUIT

SCALE IN FEET 0 2 4

EXISTING 2½" FUEL OIL LINE

1½" STEAM LINE

CONDENSATE LINE

1" ELECTRICAL CONDUIT

8" TYLER GROOVED PIPE COUPLING (TYP.)

WEST END OF THE MAIN UTILITY TUNNEL PIPING BELOW EL. 32'

NEW 8" WATER MAIN (DI) TYLER GROOVED PIPE CLASS 52

UNIT HEATER

4" PVC ACTIVATED CARBON

TUNNEL STA. 0+00

EXISTING TUNNEL WALL

TYLER GROOVED DI PIPE 8"+12" WATER MAINS

FLANGE (TYP.)

GROOVED PIPE COUPLING

18' (TYP.)

18" (TYP.)

TYLER GROOVED DI TEE WITH FLANGED BRANCH END (TYP.)

PARTIAL PLAN - MAIN UTILITY TUNNEL PIPING

SCALE 1" = 2'-0"

EXISTING 4" NATURAL GAS LINE

NEW 6" VALVE, CLOW (4-23-91)

NEW 6" HYD. VALVE, CLOW (4-23-91)

HEATER W/THERMOSTAT

MATCH LINE 2 STA. 1+19.75

ELECTRICAL CONDUITS

NEW EXISTING 8" WATER MAIN (TO BE REMOVED AND REPLACED)

EXPANSION JOINTS

PARTIAL PLAN - MAIN UTILITY TUNNEL PIPING

SCALE 1" = 2'-0"

EXISTING 4" NATURAL GAS LINE

EXISTING HYDRANT VALVE (TO BE REMOVED & REPLACED)

HEATER W/THERMOSTAT

PIPE TRAY

2" STEAM LINE

3" STEAM LINE

NEW 3" FUEL OIL LINE

1" ELECTRICAL CONDUIT

CARBON LINE

MATCH LINE 2 STA. 1+19.75

MATCH LINE 3 STA. 1+80

NEW EXISTING 8" WATER MAIN (TO BE REMOVED AND REPLACED)

TUNNEL WALL

NEW 3" FUEL OIL LINE

PARTIAL PLAN - MAIN UTILITY TUNNEL PIPING

SCALE 1" = 2'-0"

EXISTING 4" NATURAL GAS LINE

PIPE TRAY

1" ELECTRICAL CONDUIT

3" STEAM LINE

1½" CONDENSATE LINE

MATCH LINE 3 STA. 1+80

MATCH LINE 4 STA. 2+40

6" HYD. VALVE TO BE REMOVED AND REPLACED

NEW 6" HYD VALVE, CLOW (4-23-91)

EXPANSION JOINTS

ELECTRICAL CONDUITS

1" ELECTRICAL CONDUIT

NEW 3" FUEL OIL LINE

HEATER W/THERMOSTAT

PARTIAL PLAN - MAIN UTILITY TUNNEL PIPING

SCALE 1" = 2'-0"

PIPE TRAY

3" STEAM LINE

NEW EXISTING 8" WATER MAIN (TO BE REMOVED AND REPLACED)

1½ CONDENSATE LINE

STATE OF MISSOURI — CARMON ALLEN LEWIS — NUMBER E-19624 — PROFESSIONAL ENGINEER

SEE SHEET 8 OF 12 FOR CONTINUATION OF THE TUNNEL AND LINES.

NO	DATE	BY	NATURE
			REVISIONS

REHABILITATION OF

NATURAL GAS, FUEL OIL, WATER AND CARBON DIOXIDE PIPING AT THE WATER TREATMENT PLANT - PLAN

WATER & POLLUTION CONTROL DEPARTMENT — ENGINEERING SERVICES
CITY OF KANSAS CITY, MISSOURI

DRAWING NO. 17,841

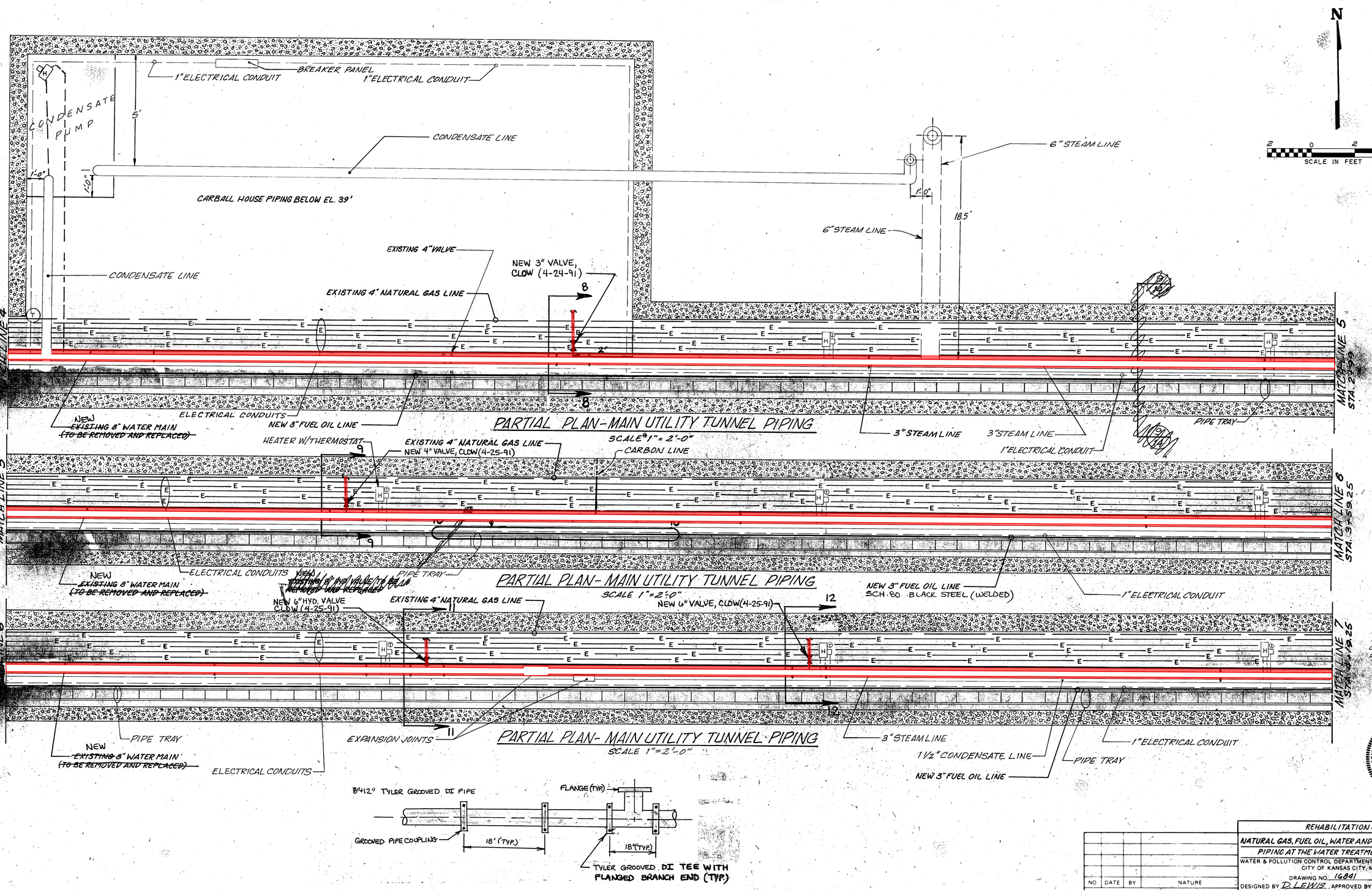
DESIGNED BY D. LEWIS — APPROVED BY M. A. ALMAI

DETAILED BY B.L.W. & J.D.C. — DATE

7 OF 14

E-2520 SEC. 11 TP. 50 R. 33 C-20A

MICROFILMED



STATE OF MISSOURI
DAMON ALLEN LEWIS
NUMBER E-19824
REGISTERED PROFESSIONAL ENGINEER

NO	DATE	BY	NATURE

REVISIONS

REHABILITATION OF
NATURAL GAS, FUEL OIL, WATER AND CARBON DIOXIDE
PIPING AT THE WATER TREATMENT PLANT-PLAN
WATER & POLLUTION CONTROL DEPARTMENT ENGINEERING SERVICES
CITY OF KANSAS CITY, MISSOURI
DRAWING NO. 16841
DESIGNED BY D.LEWIS APPROVED BY M.A. ALMAI
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8 OF 14

E-2520 SEC. 11 TP. 50 R. 33 C-24A

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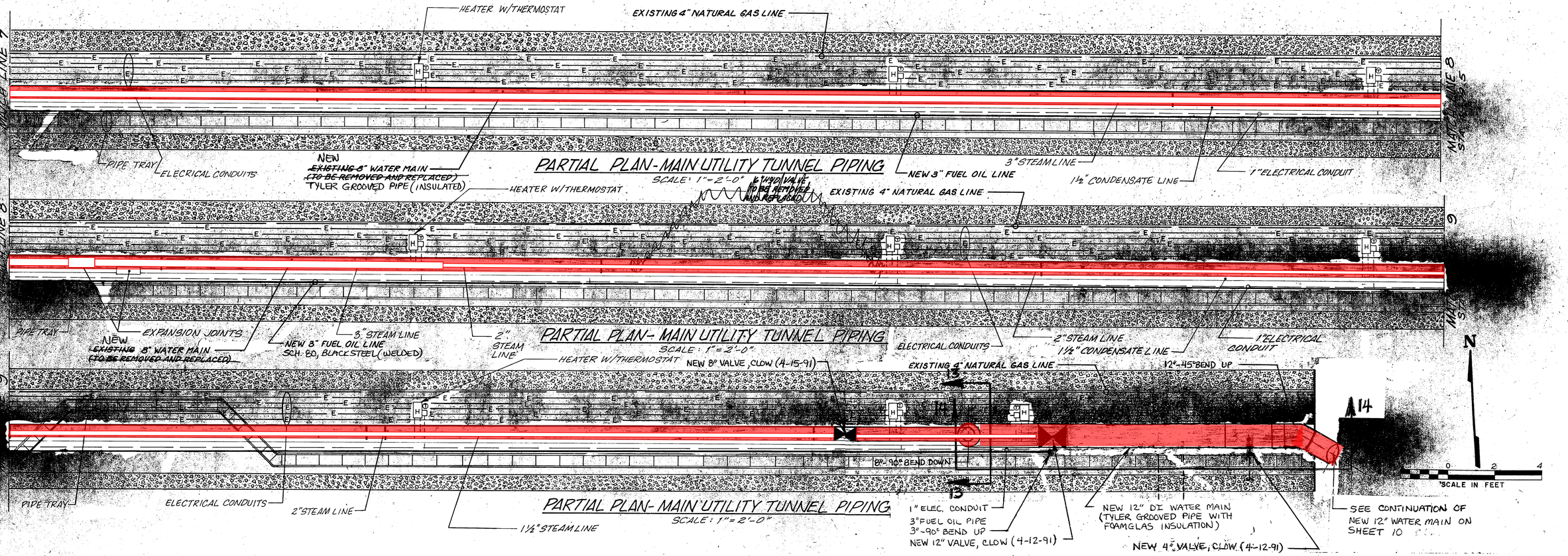
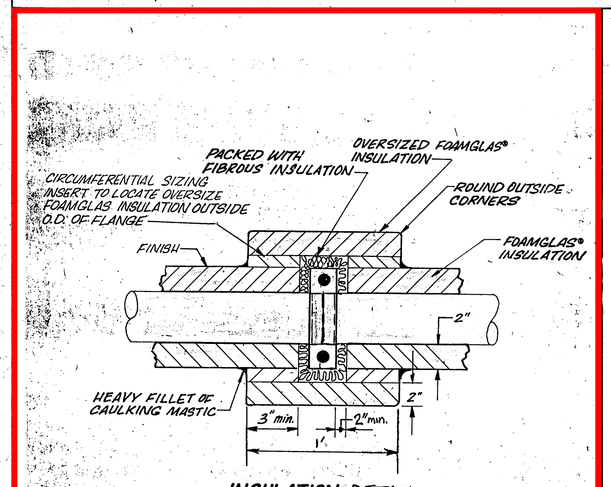
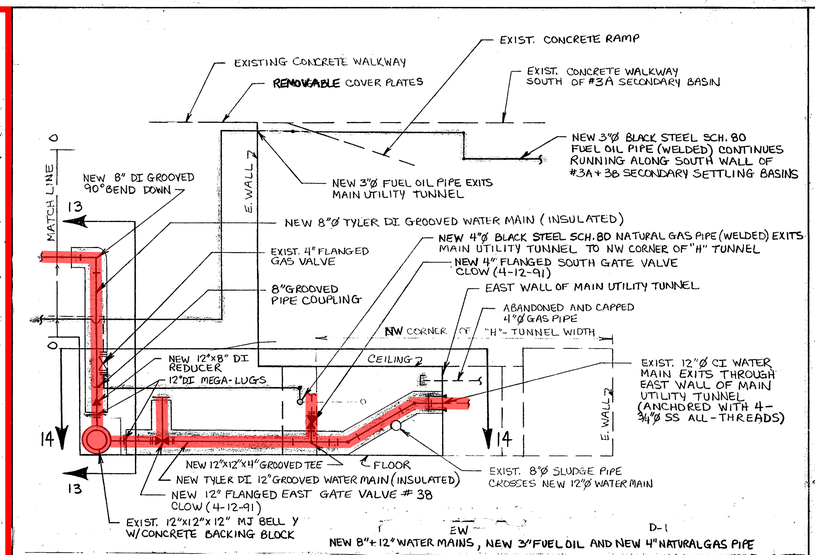
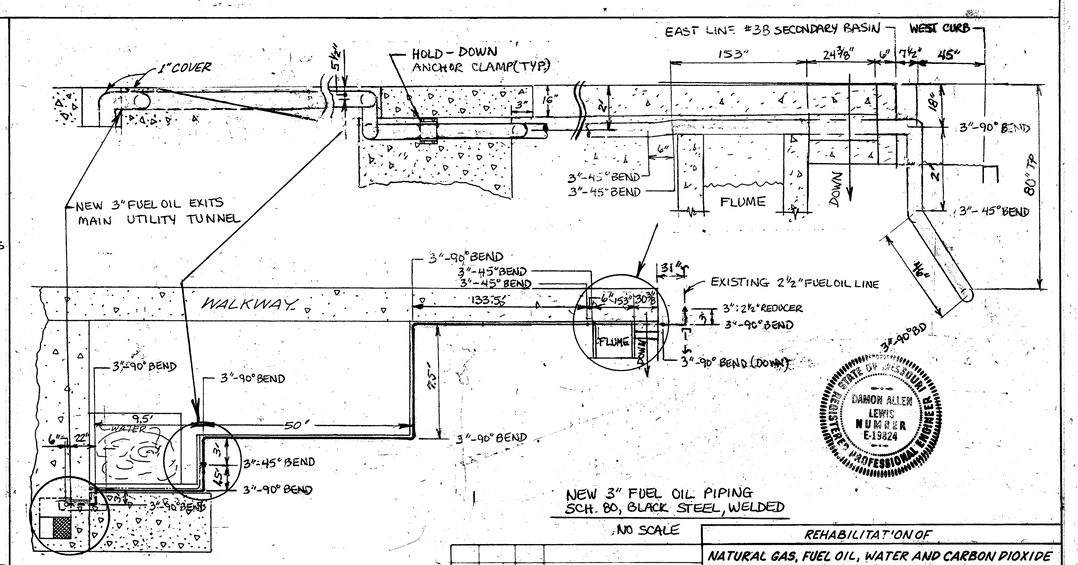




INSULATION DETAIL
NEW 8" AND 12" WATER MAIN
GROOVED PIPE COUPLINGS (TYP.)
FLANGED CONNECTIONS (TYP.)



JUNCTION OF MAIN UTILITY TUNNEL & NO. 3. FINAL (PROFILE)
SCALE: 1"=4'



NEW 3" FUEL OIL PIPING
SCH. 80, BLACK STEEL, WELDED

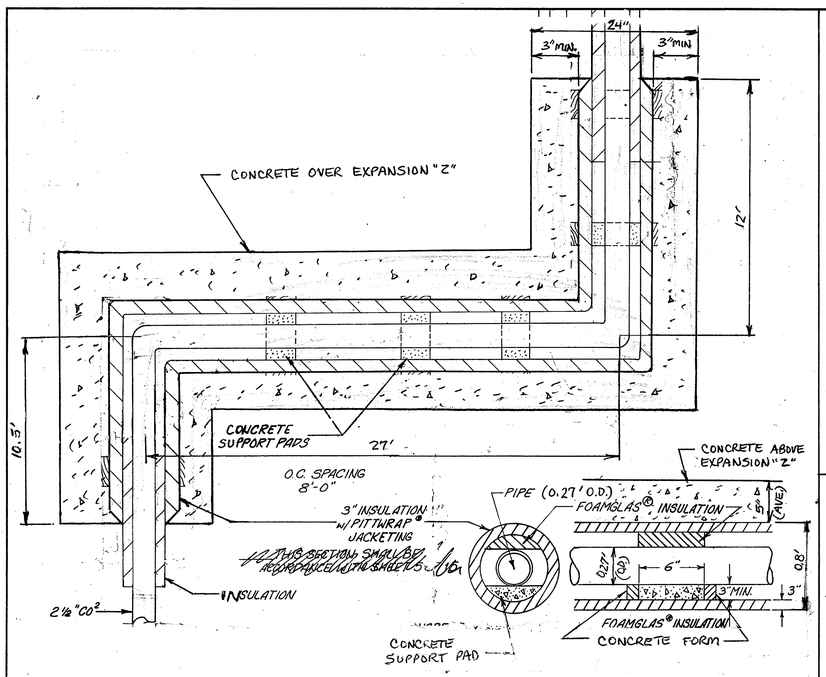
NO SCALE

NO	DATE	BY	NATURE

REVISIONS

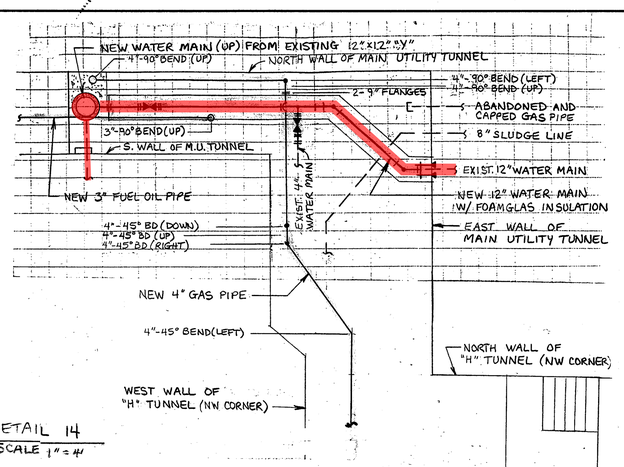
REHABILITATION OF
NATURAL GAS, FUEL OIL, WATER AND CARBON DIOXIDE
PIPING AT THE WATER TREATMENT PLANT - PLAN
WATER & POLLUTION CONTROL DEPARTMENT ENGINEERING SERVICES
CITY OF KANSAS CITY, MISSOURI
DRAWING NO 16841
DESIGNED BY D. LEWIS APPROVED BY M.A. ALMAI
DETAILED BY B.L.W. & J.D.C. DATE
9 OF 14

E-2520 SEC. 11 TP. 50 R. 33 C-20A

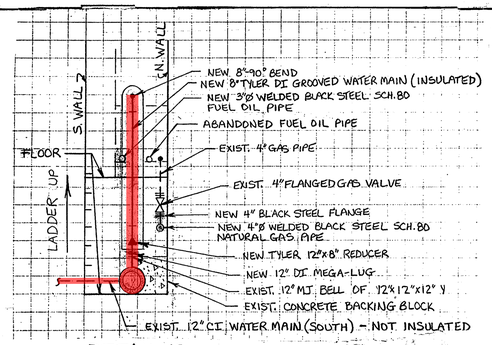


DETAIL A

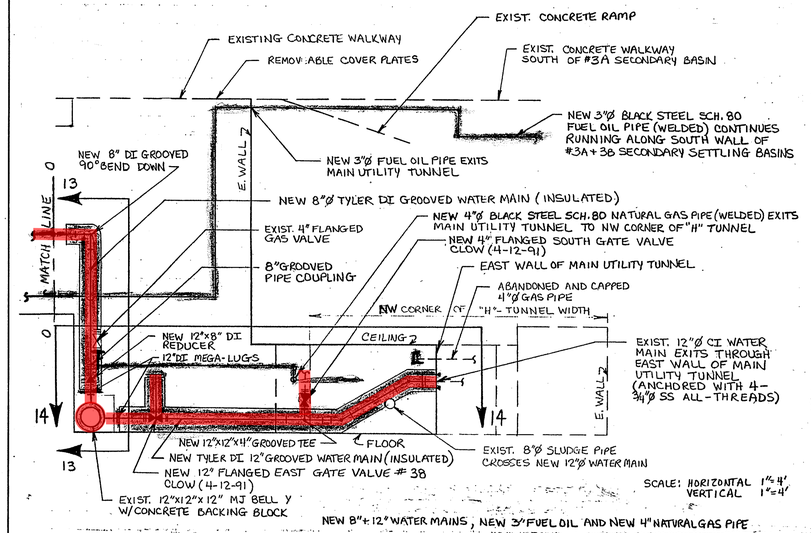
INSULATION SUPPORT DETAIL



DETAIL 14
SCALE 1" = 1'

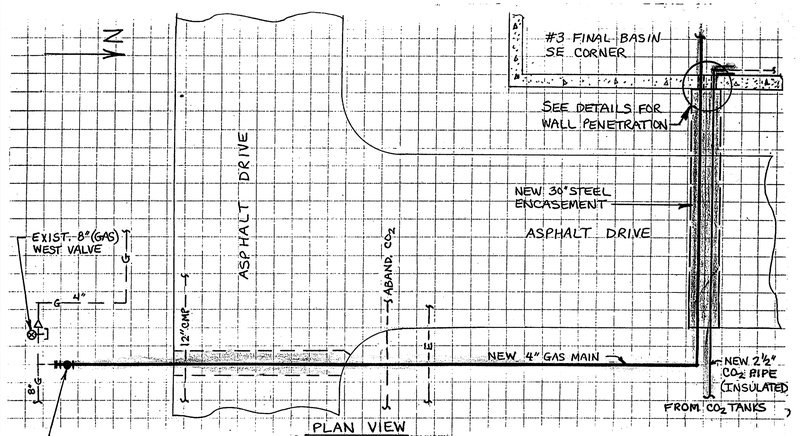


DETAIL 13
SCALE: 1"=4'



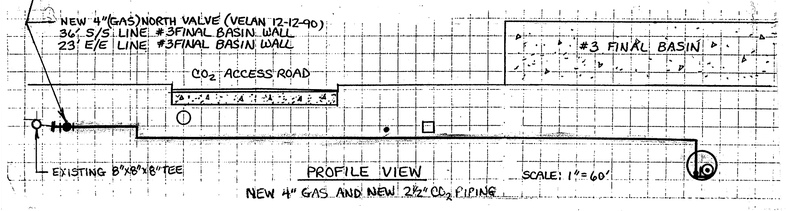
JUNCTION OF MAIN UTILITY TUNNEL & NO. 3 FINAL

PROFILE



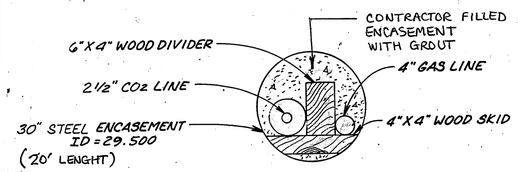
PLAN VIEW

NEW 4" GAS AND NEW 2½" CO_2 PIPING SCALE: 1"=60'

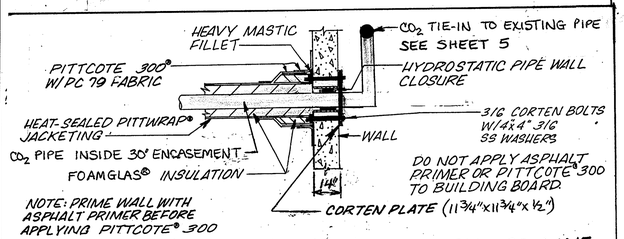


PROFILE VIEW

NEW 4" GAS AND NEW 2½" CO_2 PIPING SCALE: 1"=60'

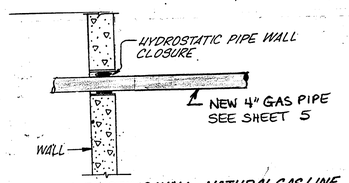


ENCASEMENT SECTION
SCALE 3/4"=1'-0"



WALL PENETRATION - EXISTING WALL - CO_2 LINE

NO SCALE



WALL PENETRATION-EXISTING WALL-NATURAL GAS LINE

NO SCALE

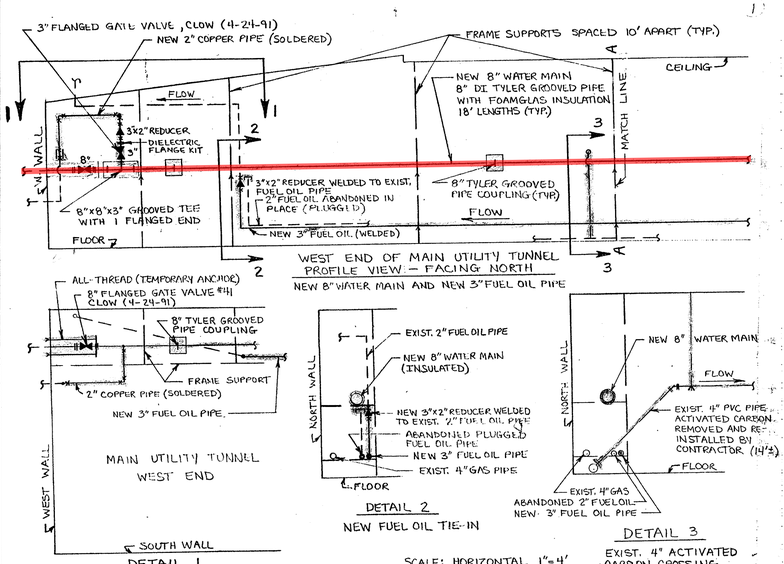
STATE OF MISSOURI REGISTERED PROFESSIONAL ENGINEER
DAMON ALLEN LEWIS NUMBER E-19824

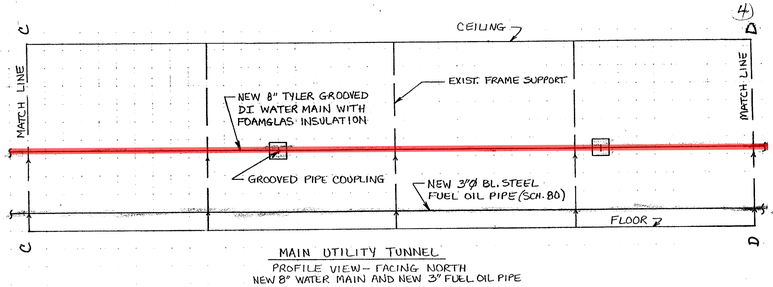
NO	DATE	BY	NATURE
REVISIONS			

REHABILITATION OF
NATURAL GAS, FUEL OIL, WATER AND CARBON DIOXIDE
PIPING AT THE WATER TREATMENT PLANT - DETAILS
WATER & POLLUTION CONTROL DEPARTMENT ENGINEERING SERVICES
CITY OF KANSAS CITY, MISSOURI
DRAWING NO. 16881
DESIGNED BY D. LEWIS APPROVED BY M.A. ALMAI
DETAILED BY J. CALZARANO DATE
10 OF 14

E-2520, SEC. 11-50-33 C-24A

MICROFILMED





STATE OF MISSOURI
DAMON ALLEN LEWIS
NUMBER E-19824
REGISTERED PROFESSIONAL ENGINEER

NO	DATE	BY	NATURE
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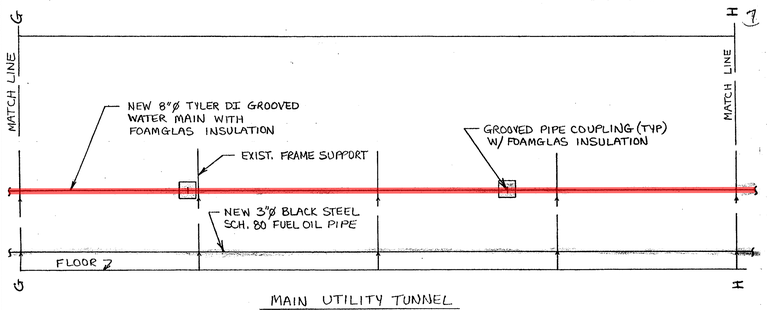
REHABILITATION OF NATURAL GAS FUEL OIL, WATER AND CARBON DIOXIDE PIPING AT THE WATER TREATMENT PLANT

WATER & POLLUTION CONTROL DEPARTMENT ENGINEERING SERVICES
CITY OF KANSAS CITY, MISSOURI

DRAWING NO. 16841
DESIGNED BY D. LEWIS APPROVED BY M. A. ALMAI
DETAILED BY E. SMOCKS DATE

11 OF 14

MICROFILMED

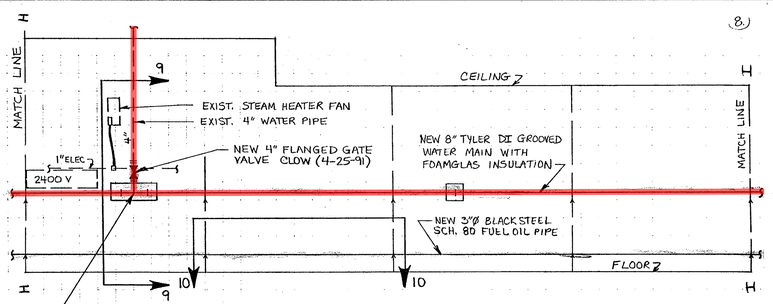


MAIN UTILITY TUNNEL

PROFILE VIEW – FACING NORTH

NEW 8" WATER MAIN AND NEW 3" FUEL OIL PIPE

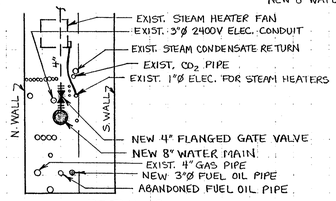
SCALE: HORIZONTAL 1"=4'
VERTICAL 1"=4'



MAIN UTILITY TUNNEL

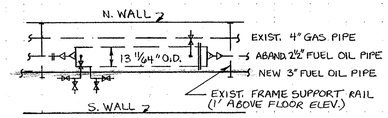
PROFILE VIEW – FACING NORTH

NEW 8" WATER MAIN AND NEW 3" FUEL OIL PIPE



DETAIL 9

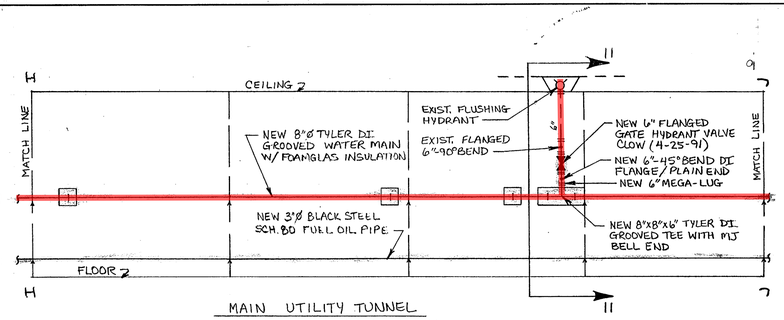
EXISTING PIPING AND RECONNECTION OF NEW 4" GATE VALVE TO EXIST. 4" WATER LINE OFF NEW 8" WATER MAIN



DETAIL 10

ABANDONED FUEL OIL PIPE AND TANK, NEW 3"Ø FUEL OIL PIPE AND EXIST. 4" Ø NATURAL GAS PIPE

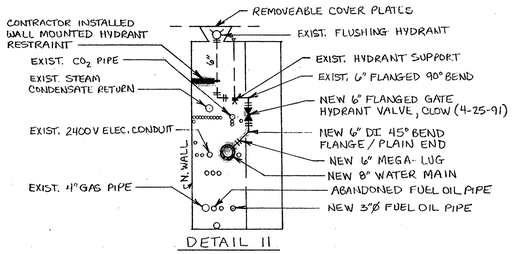
SCALE: HORIZONTAL 1"=4'
VERTICAL 1"=4'



MAIN UTILITY TUNNEL

PROFILE VIEW – FACING NORTH

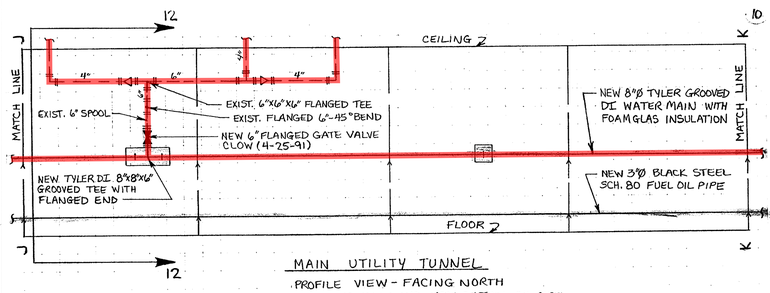
NEW 8" WATER MAIN AND NEW 3" FUEL OIL PIPE



DETAIL 11

EXISTING PIPING AND RECONNECTION OF NEW 6" HYDRANT VALVE TO EXISTING 6" HYDRANT BRANCH OFF NEW 8" WATER MAIN

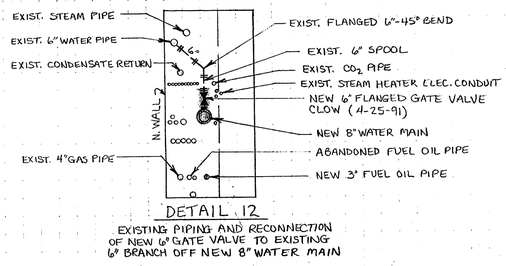
SCALE: HORIZONTAL 1"=4'
VERTICAL 1"=4'



MAIN UTILITY TUNNEL

PROFILE VIEW – FACING NORTH

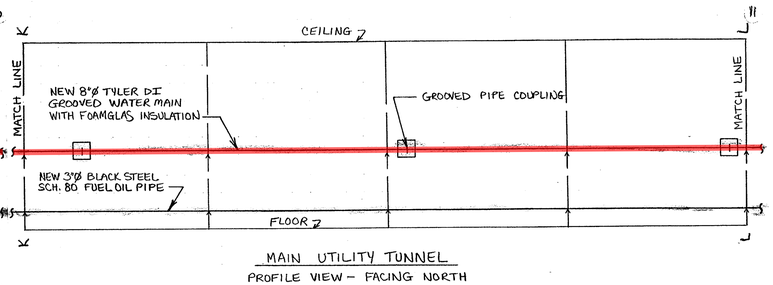
NEW 8" WATER MAIN AND NEW 3" FUEL OIL PIPE



DETAIL 12

EXISTING PIPING AND RECONNECTION OF NEW 6" GATE VALVE TO EXISTING 6" BRANCH OFF NEW 8" WATER MAIN

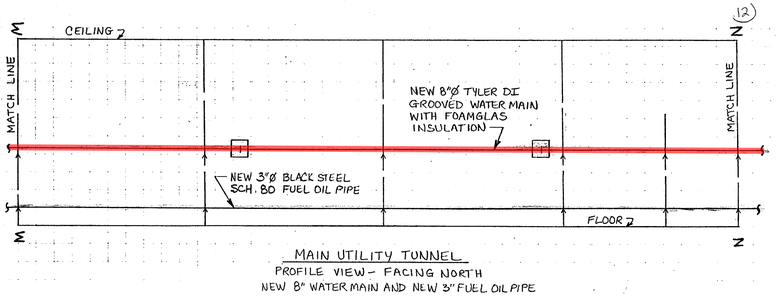
SCALE: HORIZONTAL 1"=4'
VERTICAL 1"=4'



MAIN UTILITY TUNNEL

PROFILE VIEW – FACING NORTH

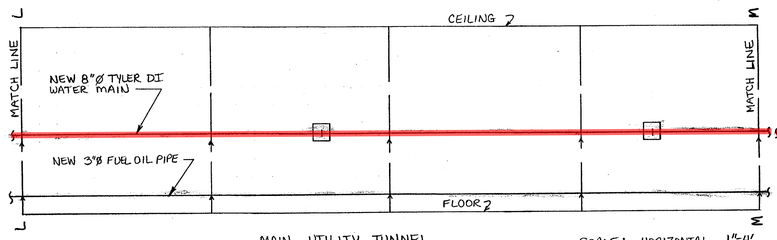
NEW 8" WATER MAIN AND NEW 3" FUEL OIL PIPE



MAIN UTILITY TUNNEL

PROFILE VIEW – FACING NORTH

NEW 8" WATER MAIN AND NEW 3" FUEL OIL PIPE

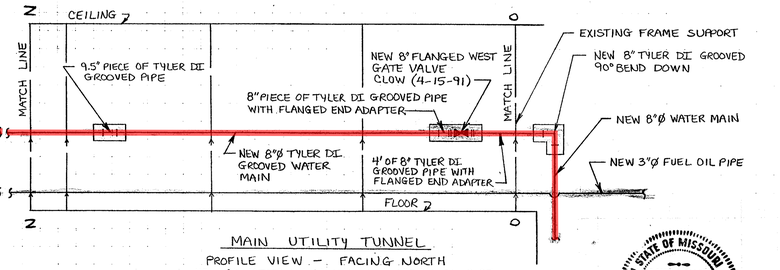


MAIN UTILITY TUNNEL

PROFILE VIEW – FACING NORTH

NEW 8" WATER MAIN AND NEW 3" FUEL OIL PIPE

SCALE: HORIZONTAL 1"=4'
VERTICAL 1"=4'



MAIN UTILITY TUNNEL

PROFILE VIEW – FACING NORTH

NEW 8" WATER MAIN AND NEW 3" FUEL OIL PIPE

SCALE: HORIZONTAL 1"=4'
VERTICAL 1"=4'

STATE OF MISSOURI
DAMON ALLEN LEWIS
NUMBER E-19824
REGISTERED PROFESSIONAL ENGINEER

NO	DATE	BY	NATURE

REVISIONS

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NATURAL GAS, FUEL OIL, WATER AND CARBON DIOXIDE PIPING AT THE WATER TREATMENT PLANT

WATER & POLLUTION CONTROL DEPARTMENT ENGINEERING SERVICES
CITY OF KANSAS CITY, MISSOURI

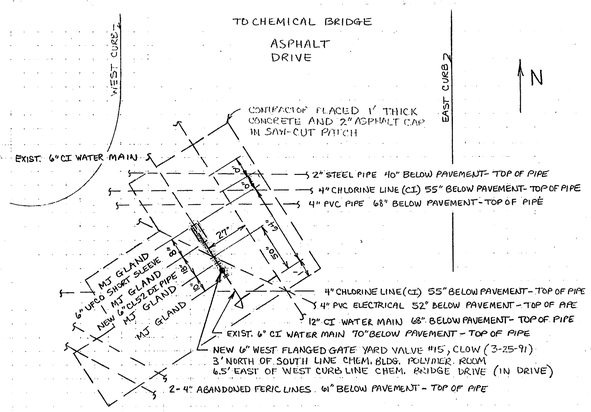
DRAWING NO 16841

DESIGNED BY D.A. LEWIS APPROVED BY M.A. ALMAI

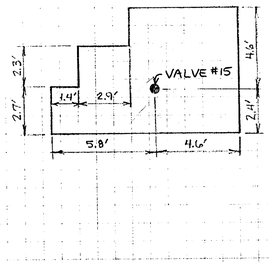
DETAILED BY F. SMOCKS DATE

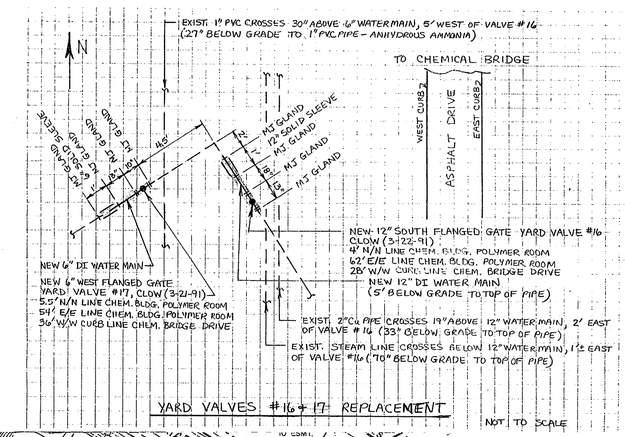
18 OF 19

MICROFILMED

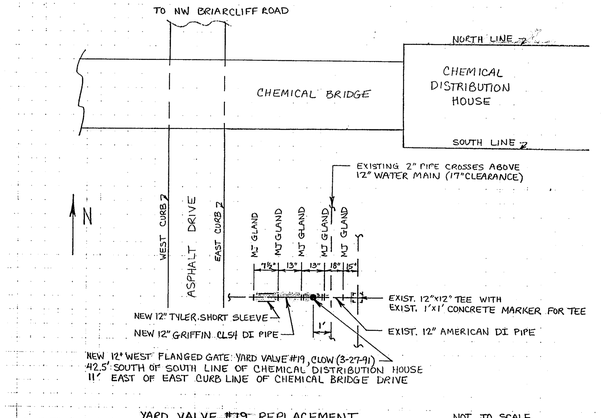


YARD VALVE #15 REPLACEMENT NOT TO SCALE

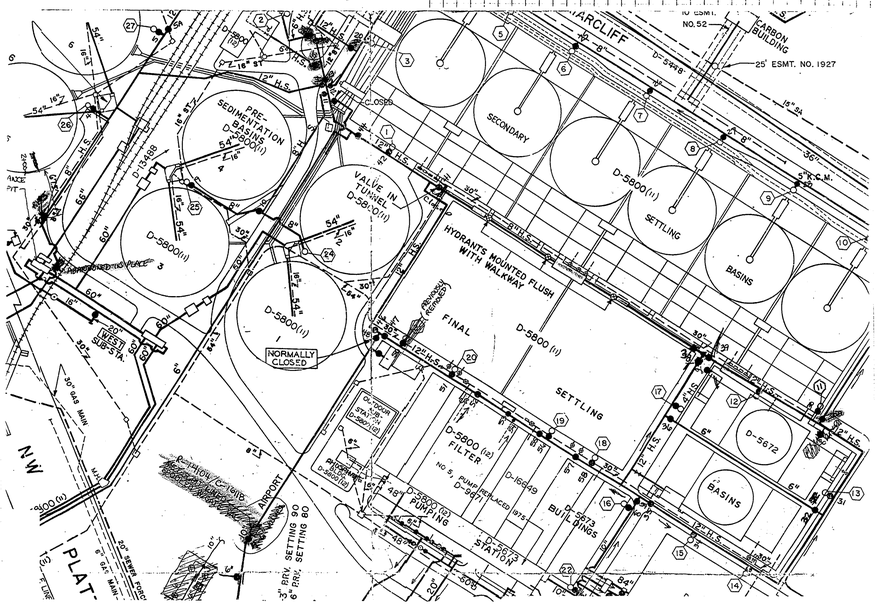


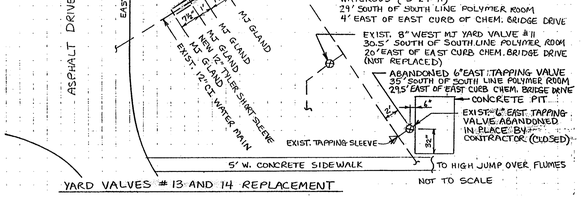


YARD VALVES #16 & 17 REPLACEMENT NOT TO SCALE

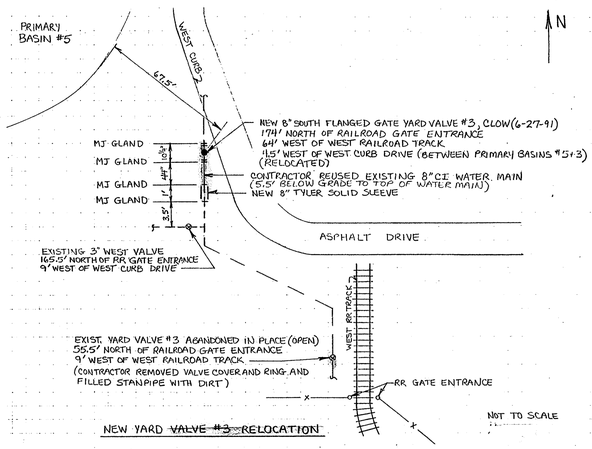


YARD VALVE #19 REPLACEMENT NOT TO SCALE

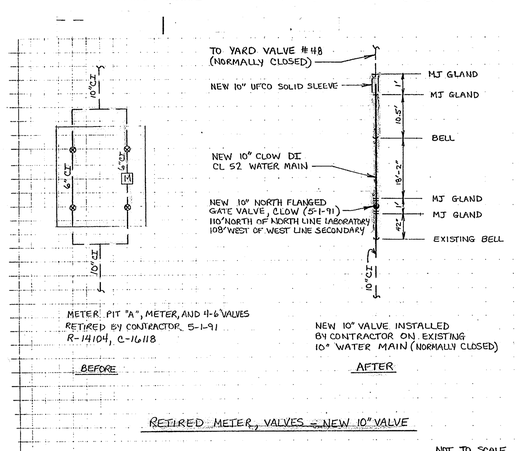




YARD VALVES #13 AND 14 REPLACEMENT NOT TO SCALE



NEW YARD ~~VALVE #3~~ RELOCATION NOT TO SCALE



METER PIT "A", METER, AND 1-6" VALVES RETIRED BY CONTRACTOR 5-1-91 R-14104, C-16118

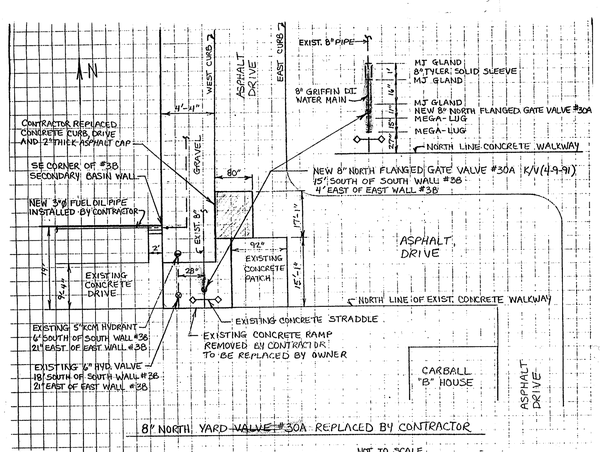
BEFORE

NEW 10" VALVE INSTALLED BY CONTRACTOR ON EXISTING 10" WATER MAIN (NORMALLY CLOSED)

AFTER

RETIRED METER, VALVES & NEW 10" VALVE

NOT TO SCALE



8" NORTH YARD VALVE #30A REPLACED BY CONTRACTOR

NOT TO SCALE

STATE OF MISSOURI
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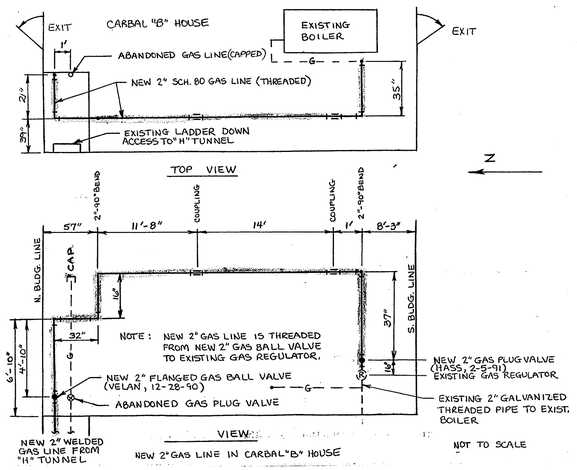
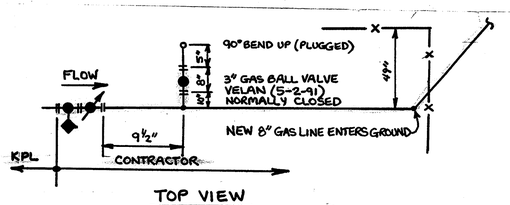
DETAILED BY J. CALCARANO DATE

13 OF 14

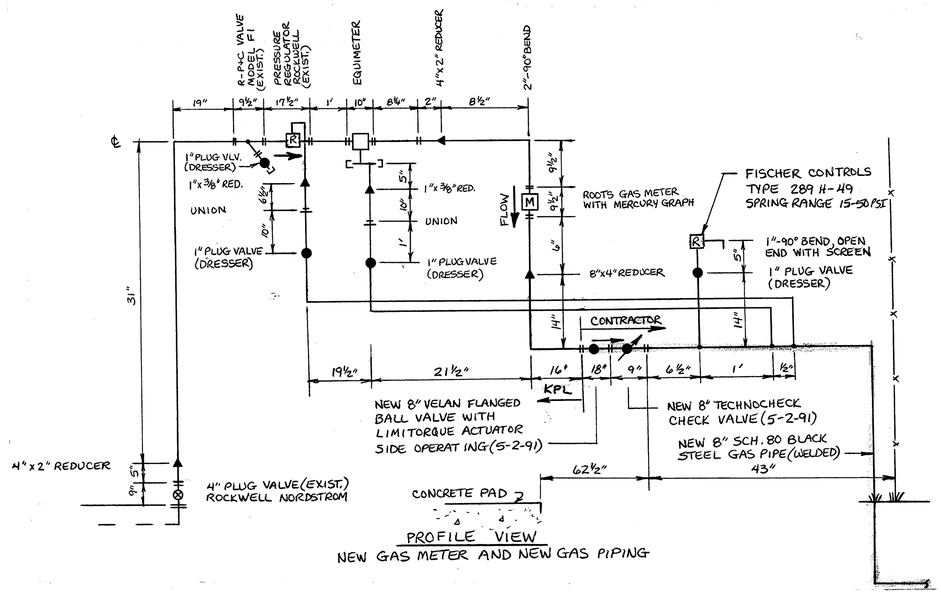
E-2520, SEC. 11-50-33 C-24A

MICROFILMED

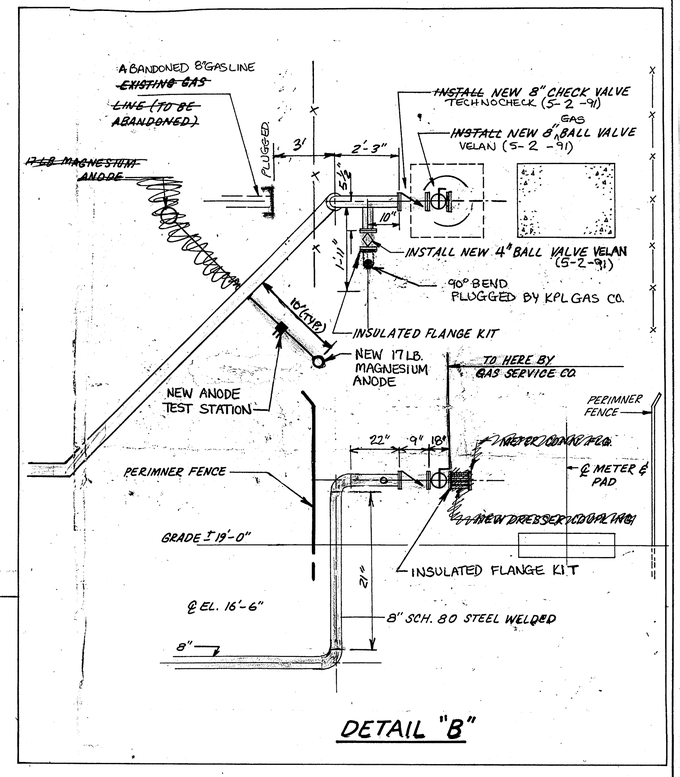




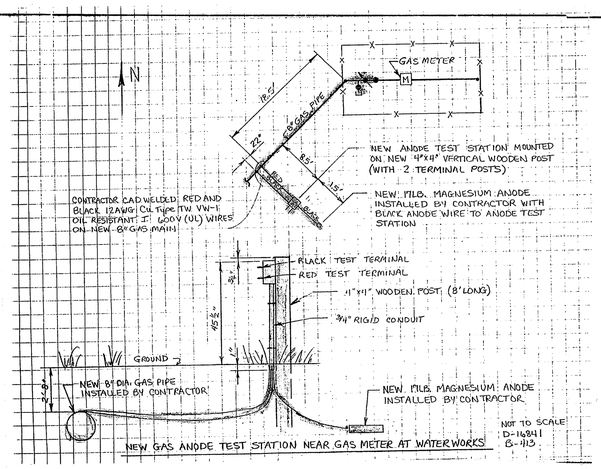
TOP VIEW



PROFILE VIEW
NEW GAS METER AND NEW GAS PIPING



DETAIL "B"



NEW GAS ANODE TEST STATION NEAR GAS METER AT WATERWORKS

STATE OF MISSOURI
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14 OF 14

MICROFILMED

B-413

N.K.C WATER PLANT

CUT NOTES

NEW 8" GAS MAIN

10-31-9.

C.O.P. - SIRAQUSO

π - BURKS, SNYDER

Δ - WAGNER, TOLIVER, ANDERSON

NO. 447 TELEDYNE

MICROFILMED

1 OF 11

D-16841

(2)

STA.	+	H.I.	−	ELEV.	o/s off G/MH./℄
BM				25.92	
℄	1.59	27.51			
			6.40	21.11	
℄	1.80	22.91			
5+80					10' RT
5+82	Anode				10' RT.
6+00					10' RT.
6+09	Anode				10' RT.
6+36	Anode				10' RT.
6+50					10' RT.
6+66	Anode				10' RT.
6+93	Anode				10' RT.
7+00					10' RT.
7+16	EX. 36" W/MH.		(STEEL)		10' RT.
7+27	Anode				10' RT.

(3)

℄ ELEV.	Hub o/s ELEV.	o/s	CUTS
BM - Ch. 'A' Top of W. WALL at Entrance to NIKE TREATMENT PLANT			
16.7	3.0 = 19.91	(10)	C - 3.2
		(0)	
16.5	3.0 = 19.91	(10)	C - 3.4
		(0)	
		(0)	
16.0	3.2 = 19.71	(10)	C - 3.7
		(0)	
		(0)	
16.2	3.4 = 19.51	(10)	C - 3.3
		(0)	
		(0)	

TELEDYNE NO. 447

RECORDED

2 OF 11

D-16841

④ STA.	+	H.I. 22.91	—	ELEV.	o/s oFF G/MIN / ℄
7+50					10' RT.
7+51	Anode				10' RT
7+63.5	24" Prestressed Conc. Water Main				
7+80	Anode				10' RT
8+00					10' RT.
8+08	Anode				10' RT.
8+37	Anode				10' RT.
8+50					10' RT.
8+64	Anode				10' RT.
8+94	Anode				10' RT.
9+00					10' RT.
9+22	Anode				10' RT.

⑤ ℄ ELEV.	o/s Hub. ELEV.	o/s	CUTS
16.2	3.3 = 19.61	(10)	C - 3.4
		(0)	
		(0)	
		(0)	
16.2	3.8 = 19.11	(10)	C - 2.9
		(0)	
		(0)	
16.0	3.6 = 19.31	(10)	C - 3.3
		(0)	
		(0)	
16.0	3.5 = 19.41	(10)	C - 3.4
		(0)	

NO. 447 TELEDYNE

MICROFILMED

D-16841

⑥ STA.	+	H.I. 22.91	−	ELEV.	o/s of C G/MH / ℄	℄ ELEV.	o/s H&H ELEV.	⑦ o/s	CUTS
9+48	Anode				10' Rt.			(0)	
9+50					10' Rt.	16.0	3.5 = 19.41	(10)	C - 3.4
9+77	Anode				10' Rt.			(0)	
10+00					10' Rt.	16.0	3.7 = 19.21	(10)	C - 3.2
10+07	Anode				10' Rt.			(0)	
10+35	Anode				10' Rt.			(0)	
10+50					10' Rt.	16.0	3.5 = 19.41	(10)	C - 3.4
10+62	Anode				10' Rt.			(0)	
10+90	Anode				10' Rt.			(0)	
11+00					10' Rt.	16.0	3.8 = 19.11	(10)	C - 3.1
11+18	Anode				10' Rt.			(0)	
11+47	Anode				10' Rt.			(0)	

NO 447 TELEDYNE

MICROFILMED

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D-16841

(8)

STA.	+	H.I.	−	ELEV.	o/s off C/MN/℄
		22.91			
11+50					10'Rt.
11+75	Anode				10'Rt.
12+00					10'Rt.
12+02	Anode				10'Rt.
12+30	Anode				10'Rt.
12+52	8" 45° Bd				10'Rt.
12+72	Anode				10'Rt.
			2.76	20.15	
℔	6.92	27.07			
BM			1.16	25.91	

(9)

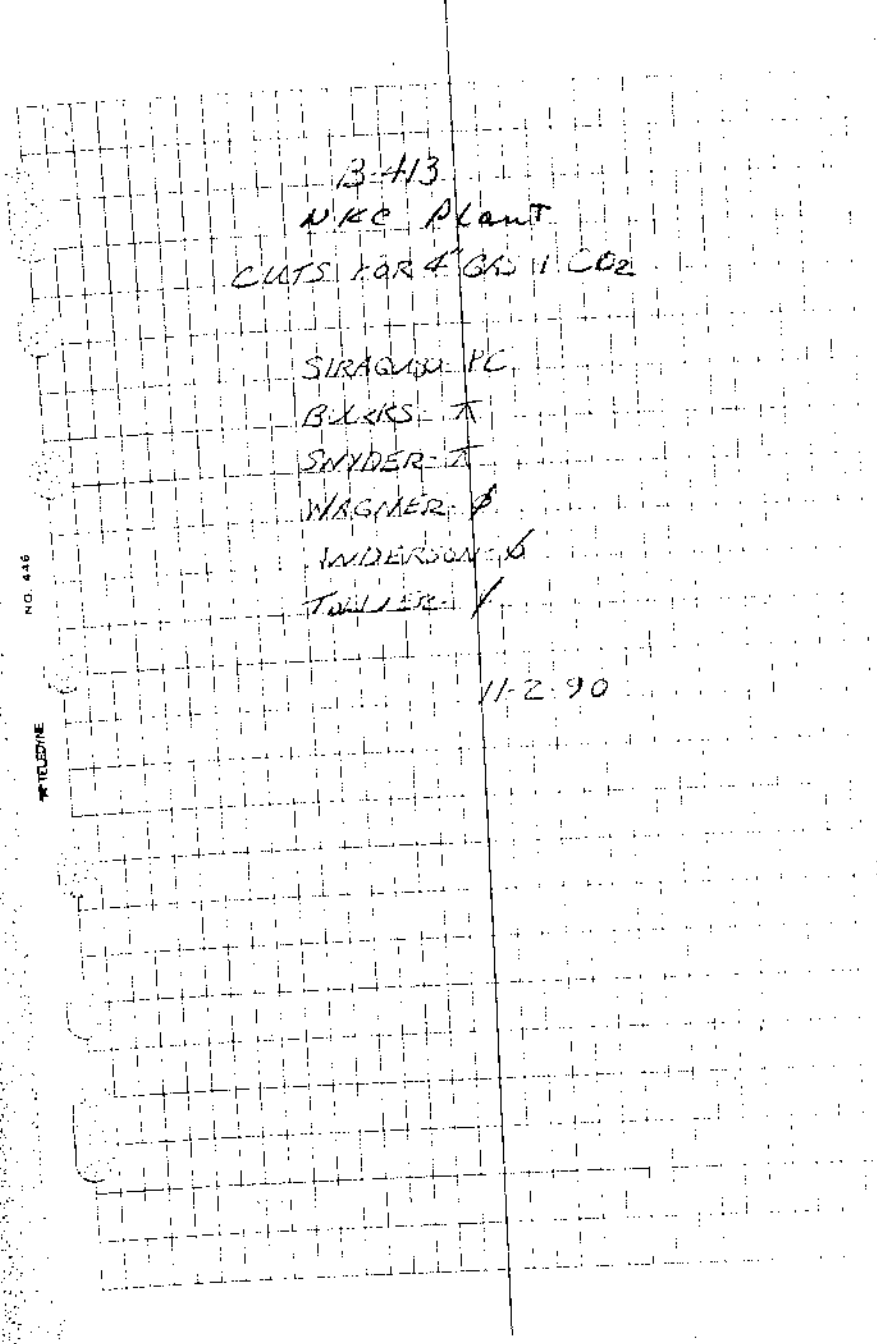
℄ ELEV.	o/s Hub ELEV.	o/s	CUTS
16.0	3.7 = 19.21	(10)	C - 3.2
		(0)	
16.0	3.7 = 19.21	(10)	C - 3.2
		(0)	
		(0)	
16.0	3.8 = 19.11	(10)	C - 3.1
		(0)	

(25.92) BM - SAME AS START

NO. 447 TELEDYNE

MICROFILMED

D-16841



MICROFILMED

D-1684

BG

(3)

Sta	+	X	—	Elev
3+80	3.40	ch. 11		
4+44	2.5" CO			
4+42 ~~4+13~~				
4+10	4+13	8" CROSSING UNDER CO LINE	90°BR	
	4+13		90°BR	
	4+00			
3+50				
3+22	CO			
3+12	Beg 8" Elec			
	4" CO's			
1+05	4" Gall V			
0+19	4" Gas			
0+16	4" Gas			
0+26	8" [illegible]			
0+09	4" Gas			

- 3.1' T"I" BELOW CURB
- 2.3' T"I"
- ~~4.5' T"Z"~~
- 2.1' T"Z"
- 2.4' T"Z"
- 3.6' T"I"
- 5.8' T"J"

1.1' T"Z"
1.2' T"Z"
1.9 T"Z"
2.0 T"I"

NO. 446

TELEDYNE

15.79	19.65=21.44	(10) Rt	C-5.79
18.20	13.41=22.70		C-4.50
21.20	9.45=26.66		C-5.46
22.80	7.26=28.85	(10) Rt	C-6.05
22.30	7.26=28.85	(10) Rt	C-6.55
26.20	5.24=30.72	(10) Lt	C-4.52
26.20	3.44=30.67	(10) Lt	C-4.47
26.20	5.81=30.30	(10) Lt	C-4.10
26.20	5.62=30.47	(10) Lt	C-4.29
25.70	5.62=30.49	(10) Lt	C-3.79
26.20	5.67=30.44	(10) Lt	C-4.24

2" DIVIDA SA CAR 7MCGAL RESERVOIR

MICROFILMED

7 OF 11

D-16841

(4)

Sta	+	⊼	−	EL
		36.11		
PK 0+56.5	END 30" ENC (LT)			
PK 0+56.5	90° BD - 30" ENC (RT)			
TBM			0.11	36.00

(5)

PT NO				
257	515+30.96	(12) RT	5.36	
257	515+30.96	(13) LT	5.26	

" D.V HYD. 1+92, 63' LT, @ B.

NO. 446

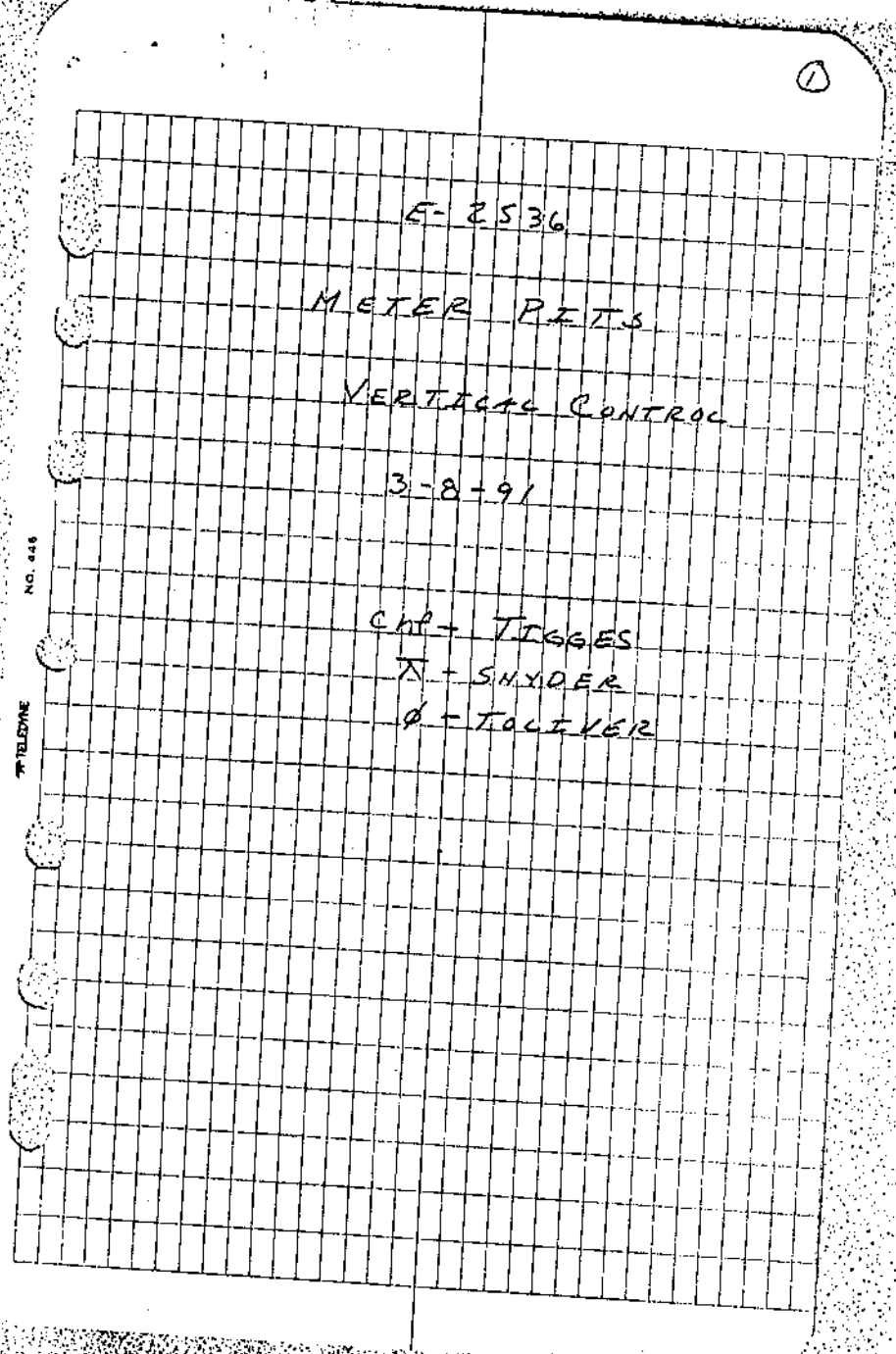
TELEDYNE

MICROFILMED 8 OF 11
D-16841

B-413
FCS

9 OF 11

D-16841



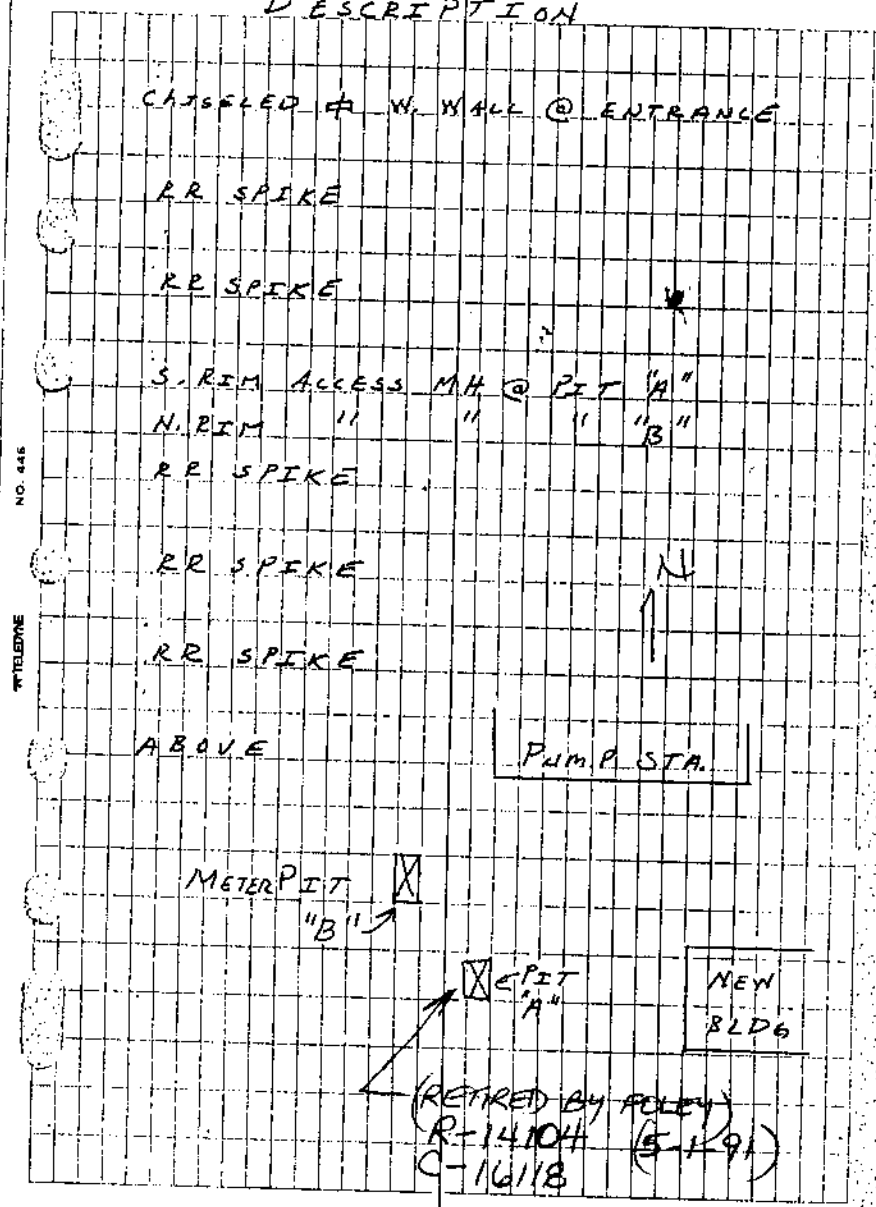
MICROFILMED
10 OF 11
D-16841

(2)

STA	+	HI	-	ELEV.
B.M.				25.92
⊼	0.49	26.41		
TP-1			4.63	21.78
⊼	4.95	26.73		
TP-2			0.59	26.14
⊼	5.77	31.91		
TBM-A			9.23	22.68
TBM-B			8.81	23.10
TP-3			5.63	26.28
⊼	0.47	26.75		
TP-4			4.89	21.86
⊼	4.50	26.36		
TP-5			4.71	21.65
⊼	5.08	26.73		
B.M.			0.82	25.91

(3)

DESCRIPTION



D-16841

MICROFILMED

1 1 OF 1 1

Kansas City, Missouri Water & Pollution Control Department
Engineering Services Division

FINAL INSPECTION CHECK LIST

Project Number : B-413 Location : Water Treatment Plant

Inspector : A. Zumbrum Contractor : Foley Date : 8-13-91

	YES	NO	N/A
1. General			
(A) Approved drawings and specifications on jobsite during construction.	✓	—	—
(B) Route photographs furnished prior to construction.	✓	—	—
(C) Streets graded and curbs in place prior to construction.	✓	—	—
2. Permits			
(A) Public Works Department - excavation permit number: _____	—	—	✓
(B) Transportation Department - street closure permit number: _____	—	—	✓
(C) MO Department of Transportation - excavation permit number: _____	—	—	✓
(D) Other required permit - type: Codes (Plumbing) number: #90-21565 11/2/90, 10/31/90, 3/8/91, 3/15/91	✓	—	—
3. Survey			
(A) Staked by: K.C. Water Dept. Date:			
(B) Cut notes with elevations provided prior to construction.	✓	—	—
(C) Offset stakes provided at proper intervals with stations and cuts marked.	✓	—	—
(D) Stakes, property corners, and monuments protected during construction.	✓	—	—

4. Materials (In accordance with specifications and submittals)

(A) Pipe manufacturer: Tyler grooved DIP Class: 55 Size & Type: 8" + 12" (water)

Laclede Steel ASTM A53 2", 2½", 3", 4", 8" (gas, carbon dioxide, fuel oil)

(B) Valve manufacturer: Clow gate valves — 3", 4", 6", 8", 10", 12"

Waterous gate valve — 12"

K/V gate valve — 8"

(C) Other Materials: Velan gas ball valves — 2", 4"

Griffin DIP 52,54 6", 8", 10", 12" (valve replacements)

McCanna, Gemini ball valves ½", 1", 1½" (carbon dioxide)

17lb. Magnesium Anodes CPS Lukens #17-D-3 (natural gas)

	YES	NO	N/A
5. Excavation			
(A) Proper depth.	✓	—	—
(B) Proper width.	✓	—	—
(C) Existing utilities marked and exposed prior to trenching.	✓	—	—
(D) Existing improvements protected (curbs, fences, etc.).	✓	—	—
(E) Rock encountered as shown on plans.	—	—	✓

MICROFILMED

D-16841

6. Pipe laying and Backfill	Yes	No	N/A
(A) Proper embedment in earth including bell holes.	✓	—	—
(B) Granular embedment or pencil tamping in accordance with specifications.	✓	—	—
(C) Pipe and fittings joined and aligned properly.	✓	—	—
(D) Valves and fittings installed at correct locations.	✓	—	—
(E) Polyethylene encasement installed in accordance with specifications.	✓	—	—
(F) Reaction blocks poured - proper size and location (including reinforcement).	✓	—	—
(G) Adequate clearance of other utilities and structures maintained.	✓	—	—
(H) Damaged utilities repaired by contractor.	✓	—	—
(I) Suitable material used for backfill.	✓	—	—
(J) Backfill in accordance with specifications.	✓	—	—

7. Testing and Disinfection

(A) 3/4" tap made by: D. McCorkle — Date made: 4-30-91

(B) Pressure test passed. — Date: 5-7-91

Line pressure: 100 psi — Test pressure: 153 psi

Number and diameter of joints: 47(8"), 8(6"), 1(4") 2(3")

Allowable leakage: 0 gal/~~2hrs~~ 30min. — Actual leakage: 0 gal/~~2hrs~~ 30min

(C) Leakage test passed. — Date: 5-7-91

Line pressure: 100 psi — Test pressure: 153 psi

Number and diameter of joints: 47(8"), 8(6"), 1(4"), 2(3")

Allowable leakage: 0 gal/~~2hrs~~ 30min — Actual leakage: 0 gal/~~2hrs~~ 30min

(D) Sterilized (chlorinated) by: Lackey — Date: 5-7-91

(E) Thoroughly flushed. — Date: 5-7-91 — ✓ — —

(F) Corporation replaced with brass plug. — Date: 5-10-91 — ✓ — —

(G) Line put into service — Date: 5-8-91 — ✓ — —

MICROFILMED

8. Clean-up and Restoration			
(A) Abandoned valve covers, etc. removed.	✓	—	—
(B) Salvaged hydrants and other materials returned to City.	✓	—	—
(C) Trash and debris removed.	✓	—	—
(D) Culverts and drains restored.	✓	—	—
(E) Damaged areas restored (streets, driveways, sidewalks, etc.).	✓	—	—
(F) Hydrant(s) at proper elevation and turned proper direction.	✓	—	—
(G) Valve covers and lids and manhole covers, etc. at proper elevation.	✓	—	—
(H) All valves and hydrants are operable.	✓	—	—
(I) Sod/seed bed properly prepared. Rocks, etc. removed. Top soil where required.	✓	—	—
(J) Sod or seed and mulch as required.	✓	—	—

9. Explanation of items marked "No" and other remarks - Leakage & pressure tests were conducted according to specs (30 min - no leakage or pressure drop) 7B,C) (2)

10. Obstacles encountered or field changes required - 8" Gas - anode at sta. 5+82 not installed (24/25 installed) 2" gas line added to contract (to "B" house), CO_2 - expansion "E" relocated, additional valves & safety pops added to CO_2 lines at tanks, yard valves #46, 47, 48, 11, 12, 18, and N.C (no number) not replaced. Contractor replaced yard valve #3, 30A, and installed 10" valve (no number) where contractor removed meter pit "A" (additions to contract.)

Project Inspector D. Zumbrum — Contractors Supervisor

D-16841

25-34D

CITY OF

KANSAS CITY, MISSOURI

WATER DEPARTMENT

CONTRACT C-125

NEW FINAL BASIN NO. 3

1955

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1 INDEX SHEET
2 GENERAL LOCATION PLAN
3 BASIN PLAN - ELEV. 15'-6"
4 CLARIFIER PLAN - ELEV. 19'-0"
5 EAST HALF - BASIN PLAN ELEV. 20'-6"
6 WEST HALF - BASIN PLAN ELEV. 20'-6"
7 EAST HALF - BASIN PLAN ELEV. 27'-6"
8 WEST HALF - BASIN PLAN ELEV. 27'-6"
9 EAST HALF - BASIN PLAN ELEV. 37'-6"
10 WEST HALF - BASIN PLAN ELEV. 37'-6"
11 NORTH-SOUTH BASIN SECTIONS SHEET NO. 1
12 NORTH-SOUTH BASIN SECTIONS SHEET NO. 2
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15 NORTH-SOUTH BASIN SECTIONS SHEET NO. 5
16 NORTH-SOUTH BASIN SECTIONS SHEET NO. 6
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42 UNASSIGNED
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44 ELECTRICAL ONE-LINE DIAGRAM
45 ELECTRICAL ELEMENTARY DIAGRAMS
46 POWER WIRING - WEST HALF BASIN - ELEV. 37'-6"
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48 ELECTRICAL DETAILS
49 POWER WIRING SCHEDULE
50 CONTROL WIRING SCHEDULE
51 BASIN LIGHTING

BURNS & McDONNELL ENGINEERING COMPANY

KANSAS CITY, MISSOURI

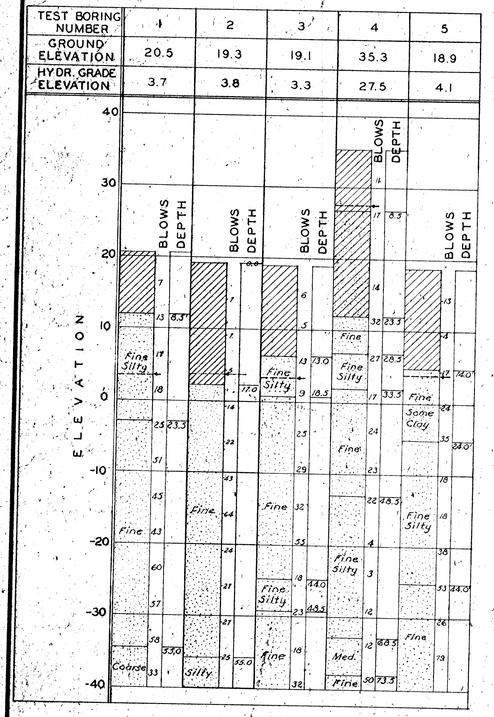
AS BUILT

5672-D31A Sh 1/49

1

MICROFILMED

TEST BORING NUMBER	1	2	3	4	5
GROUND ELEVATION	20.5	19.3	19.1	35.3	18.9
HYDR. GRADE ELEVATION	3.7	3.8	3.3	27.5	4.1



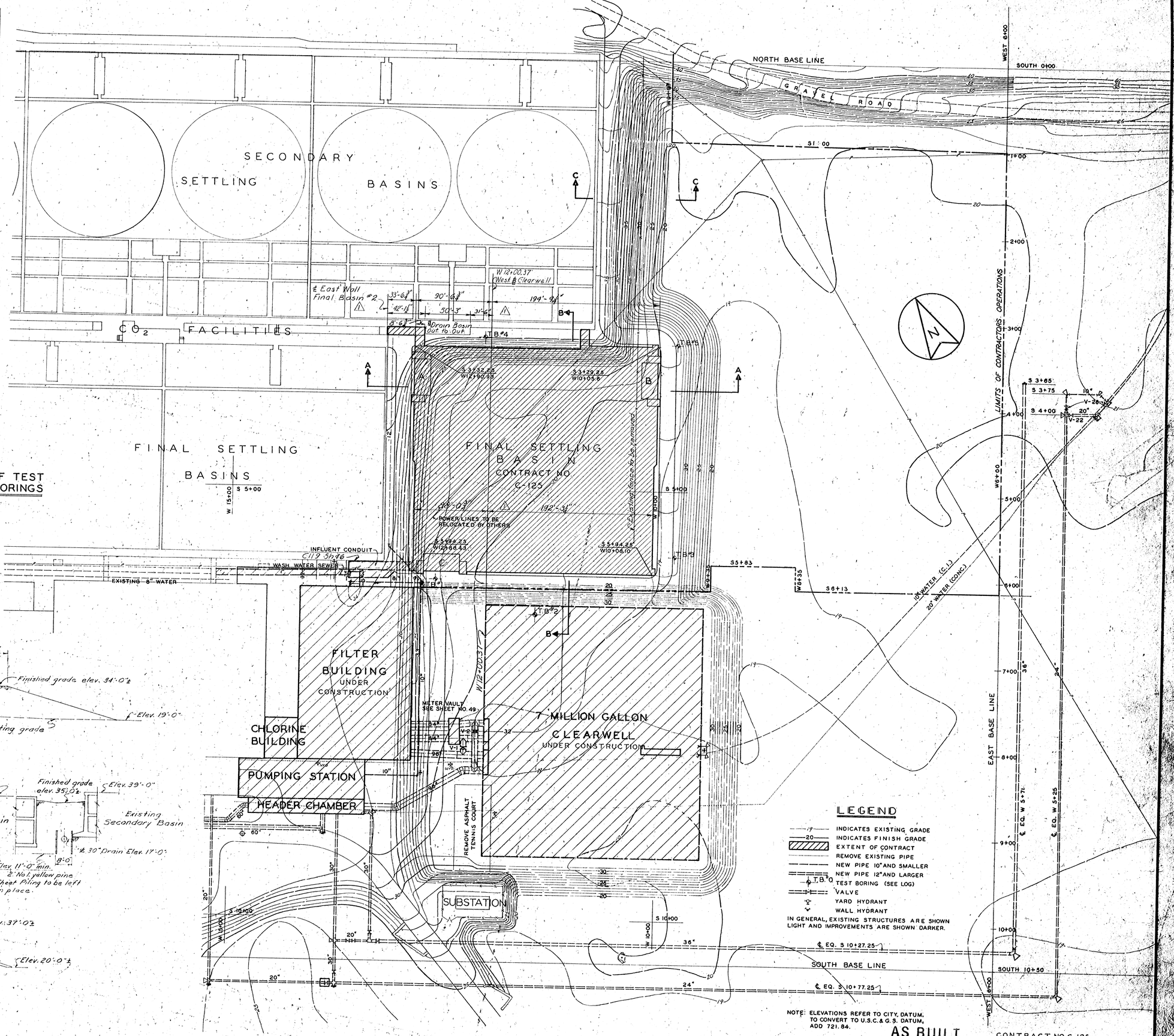
——+——INDICATES GROUND WATER SURFACE

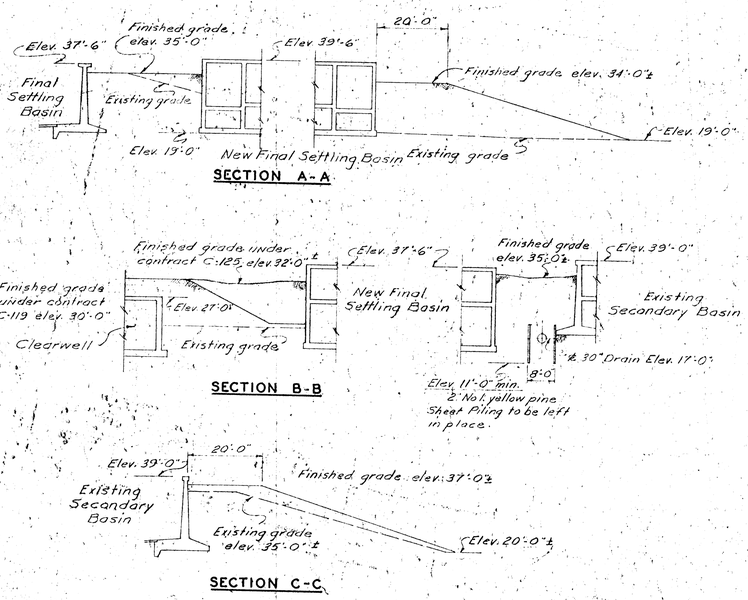
NOTE: "BLOWS" INDICATES NUMBER OF BLOWS OF 140 LB. HAMMER TO DRIVE 1½" I.D. SPLIT SPOON 12" AFTER 6" PENETRATION WAS OBTAINED

COHESIVE SOIL (CLAY)

GRANULAR SOIL (SAND)

LOG OF TEST HOLE BORINGS





SECTION A-A

SECTION B-B

SECTION C-C

LEGEND

- 19 —— INDICATES EXISTING GRADE
- 20 —— INDICATES FINISH GRADE
- EXTENT OF CONTRACT
- REMOVE EXISTING PIPE
- NEW PIPE 10" AND SMALLER
- NEW PIPE 12" AND LARGER
- T.B.#0 TEST BORING (SEE LOG)
- VALVE
- YARD HYDRANT
- WALL HYDRANT

IN GENERAL, EXISTING STRUCTURES ARE SHOWN LIGHT AND IMPROVEMENTS ARE SHOWN DARKER.

NOTE: ELEVATIONS REFER TO CITY DATUM. TO CONVERT TO U.S.C.& G.S. DATUM, ADD 721.84.

AS BUILT

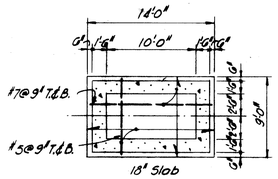
NO	DATE	BY	REVISION
1	12-26-56	F.F.L.	As Built

CONTRACT NO. C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.
General Location Plan
BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

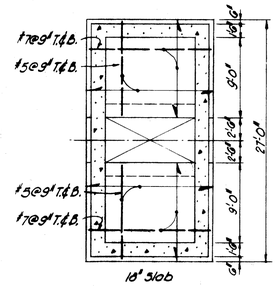
STATE OF MISSOURI REGISTERED PROFESSIONAL ENGINEER GLENN E HANDS NUMBER E-2317

DESIGNED	TRACED	JOB NO.	SHEET NO.
DETAILED	CHECKED WHH-CSB	52-340	2

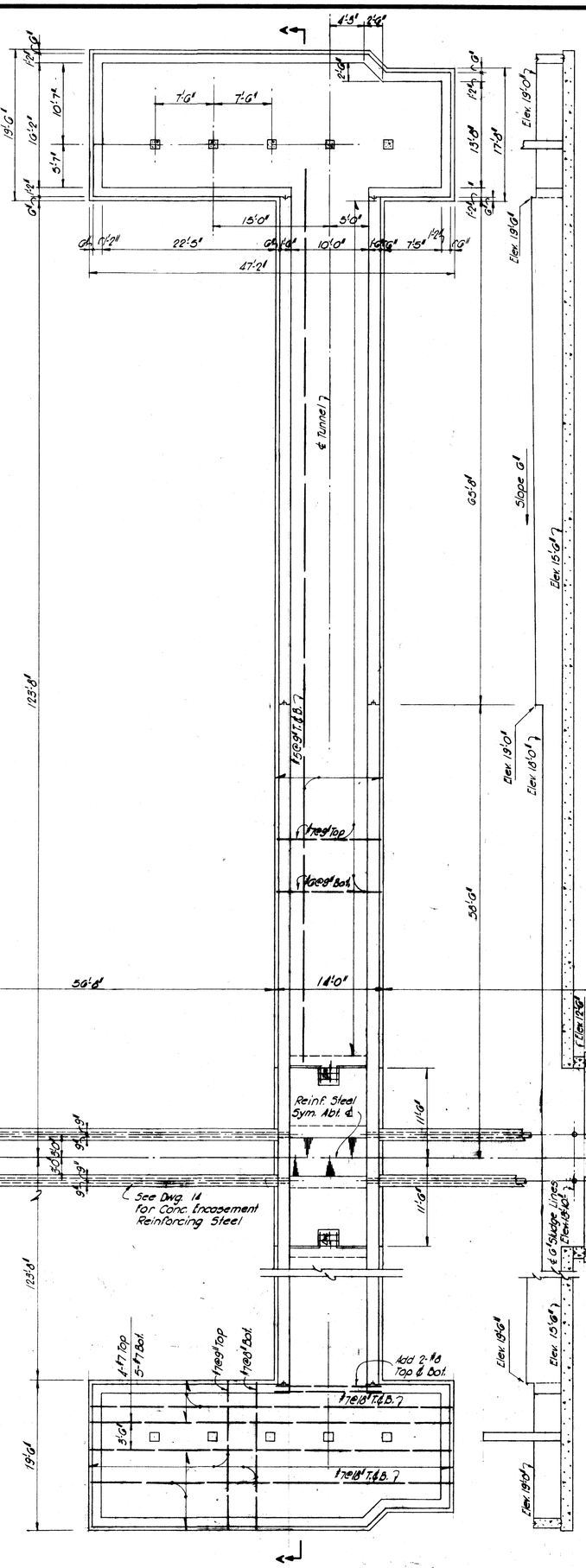
1955 SCALE 1" = 100'



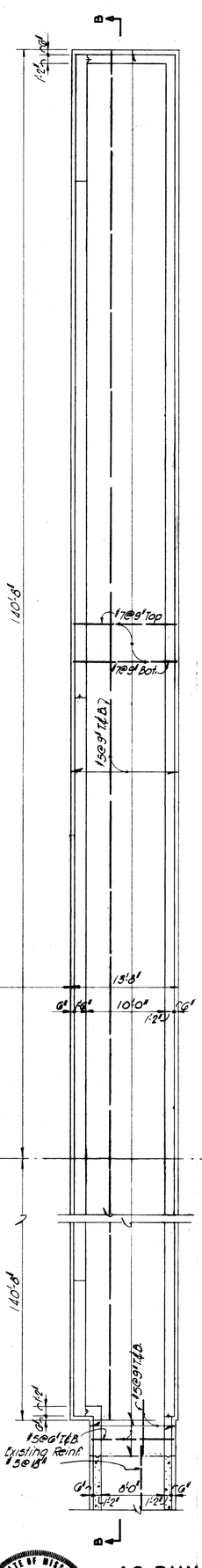
PLAN - SUMP PIT

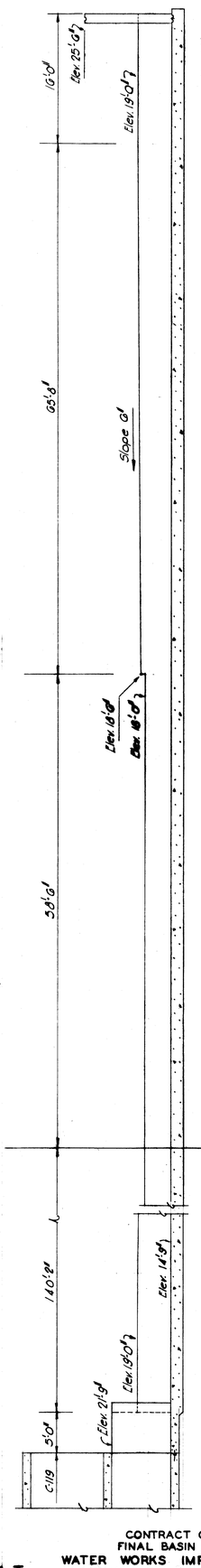


PLAN - SLUDGE PUMP PIT

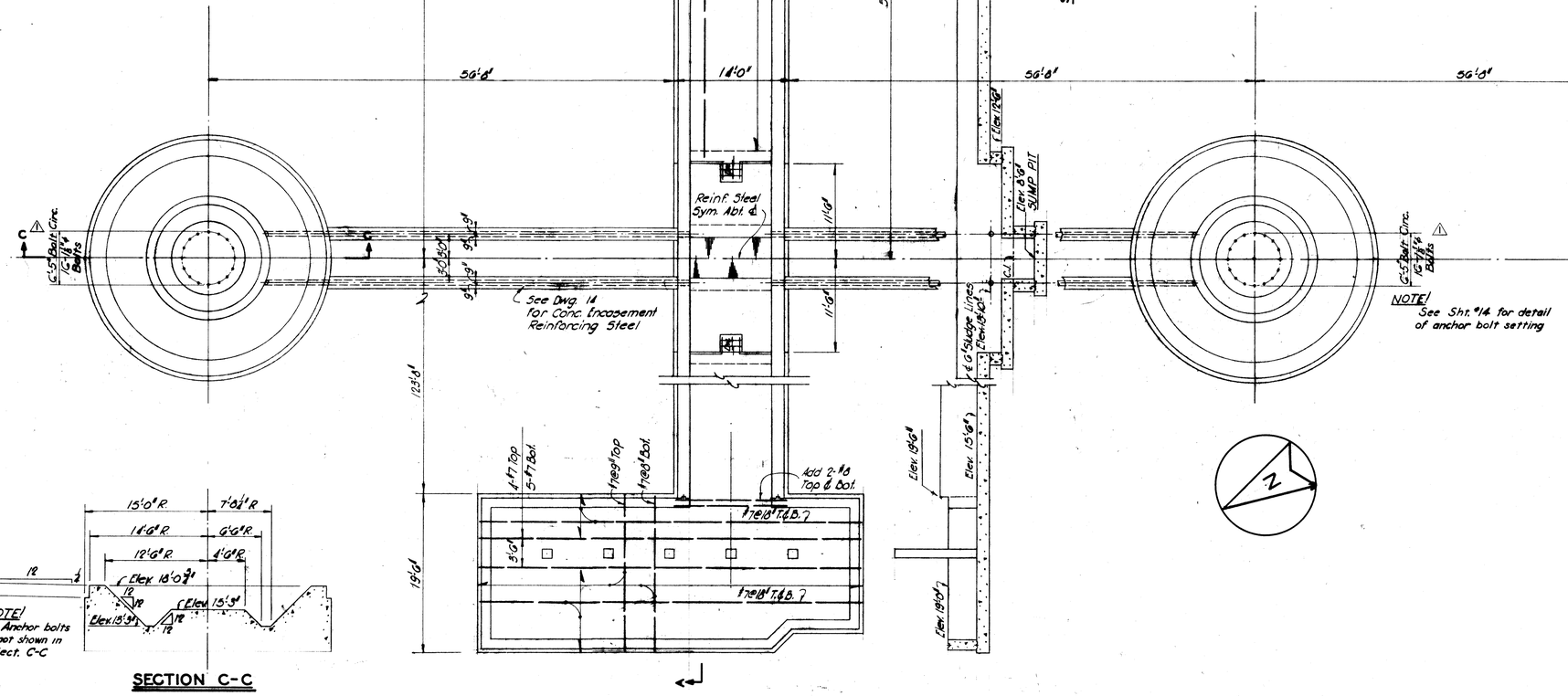


SECTION A-A





SECTION B-B



SECTION C-C

NO.	DATE	BY	REVISION
1	8-5-55	H.B.S.	Added anc. bolts to clarifier base.
	4-3-57	F.L.	As Built

STATE OF MISSOURI — GLENN E. HANDS — NUMBER E-2317 — REGISTERED PROFESSIONAL ENGINEER

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

DESIGNED	WHH-HBA	TRACED	
DETAILED	RRF	CHECKED	WHH-GSB

JOB NO. 52-34D
1955
SCALE 1/4" = 1'-0"
SHEET 3

52-034A Sh 3/9

TYPICAL REINFORCING STEEL

#5@12" T.&B.

#5@12" T.&B.

#5@12" T.&B. All T.&B.

#5@12" T.&B.

#5@12" T.&B.

#5@12" T.&B.

#5@12" Top

#5@12" Top

#5@12" Top

#5@12" Top

10-#5 Top

TYPICAL TOP REINFORCING STEEL

see SECTION 9-B-14 for additional reinf. steel

Elev. 19'0" Slope 1/4":12"

Elev. 19'0"

Slope 1/4":12"

Elev. 18'0"

TYPICAL REINFORCING STEEL

TYPICAL BOTTOM REINFORCING STEEL

#9@12" bot.

#9@12" bot.

#5@12" bot.

#5@12" bot.

#5@12" Top

#5@12" Top

#5@12" Top

#5@12" Top

25-34D -81-

25-34D -81-

Guide Plates furn. Under Contract E-125 Cast In Place As Shown Elev. 19'-0"

Guide Plates furn. Under Contract E-125 Cast In Place As Shown Elev. 19'-0"

Guide Plates furn. Under Contract E-125. Cast In Place As Shown Elev. 19'-0"

Elev. 20'-6"

Elev. 15'-6"

Elev. 19'-0"

Elev. 14'-9"

Compacted Sand Fill

Compacted Sand Fill

& Pipe Crossover See Dwg. 28 for Details

& Tunnel 7

& 24" ø Sluice Gate SG-2 Basin Drain

LEGEND

Construction Joint

Slab Pour Sequence (Corresponding Numbers In Flocculator Basins Indicate Similar Reinforcing Steel As Shown On Dwg. 9)

NO.	DATE	BY	REVISION
2	8-5-55	H.B.S.	Revised location of Guide 12's
	1-3-57	F.L.	As Built

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

GLENN E. HANDS NUMBER E-2317 REGISTERED PROFESSIONAL ENGINEER STATE OF MISSOURI

1955

DESIGNED	WHH-HBA	TRACED	
DETAILED	RRF	CHECKED	WHH-CSB

JOB NO. $2-34 D

SCALE : 1/8"=1'-0"

SHEET 5

572-0314 5/9

25-34D -85-

N

10-A-17 10-A-18 10-A-19 10-A-20 10-A-21 10-A-22 10-A-23

Elev. 1930'

Compacted Sand Fill

8'-8" 1'-0" 35'-8" 14'-2" 22'-10" 34'-8" 206'R 20'-0"R 34'-8" 22'-10" 14'-2" 33'-8" 1'-0" 1'-2" 7'-6"

#11@18" Hooks

#11@18" Bot.

10'-0" lg.

#9@12" Top

#9@12" Bot.

10'-0" lg.

#9@18" Top

#9@18" Bot.

10'-0" lg.

#6@18" T.&B.

#5@12" T.&B.

#5@9" T.&B.

#6@9" Top

#6@9" Bot.

4'-0" lg.

#6@9" Top

#6@9" Bot.

10'-0" lg.

#6@18" T.&B.

4'-7" Top

5'-7" Bot.

#6@18" T.&B.

4'-7" Top

5'-7" Bot.

#6@18" T.&B.

#6@18" T.&B.

#6@18" T.&B

NOTE! 1" ø Anc. bolts w/2½" proj.

For continuation See Dwg 27

NO	DATE	BY	REVISION
1	8-31-55	H.B.S.	Changed wall thickness from 1'-0" to 1'-2" & added anchor bolts in dry wells and dimensioned same.
2	12-26-56	F.L.	As Built

AS BUILT

CONTRACT C-125
FINAL BASIN NO 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

GLENN E. HANDS — NUMBER E-2317 — REGISTERED PROFESSIONAL ENGINEER — STATE OF MISSOURI

DESIGNED	WHH-HBA	TRACED	
DETAILED	RRF	CHECKED	WHH-CSB

JOB NO. 52-340

1955

SCALE : 1/8"=1'-0"

SHEET -REV 7 -1

5672-D 3/A SA 7/59

MICRO

25-34D -84-

10-A-17 10-A-18 10-A-19 10-A-20 10-A-21 10-A-22 10-A-23

10-C-24 10-F-24

10-A-15 10-B-15 10-A-16 10-A-24

4"D.S. To Sump

4"F.S.

4"F.D.

4"F.D.C.

15@12"T&B.

15@9"T&B.

Dome

Elev. 27'-6"

Elev. 26'-6"

Elev. 25'-6"

Elev. 23'-0"

Elev. 20'-6"

Stop Log W-1

Stop Log W-2

Stop Log W-3

(16'-0") Sluice Gate

NOTE! # Anc. bolts w/24" proj.

6 Equal Spaces @ 7'-6" = 40'-0"

Tunnel

For Continuation See Dwg 25-10B16

NO	DATE	BY	REVISION
1	8-30-55	W.B.S.	Added anchor bolts in dry wells and dimensioned same.
2	9-25-55	R.F.	Shift N.W. Basin Inlet 2'2½" to the West.
3	12-27-56	F.L.	As Built

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

GLENN E. HANDS NUMBER E-2317 REGISTERED PROFESSIONAL ENGINEER STATE OF MISSOURI

DESIGNED	WHH-HBA	TRACED	
DETAILED	RRF	CHECKED	WHH-GSB

JOB NO. 52-34D

1955

SCALE : 1/8"= 1'-0"

SHEET -REV. 8 -2

172-D-3/A 54 8/49

10-A-17 | 10-A-18 | 10-A-19 | 10-A-20 | 10-A-21 | 10-A-22 | 10-A-23

10WF49 Lateral Tie Beams

Note: Clarifiers and walkways to be furnished under Contract No. C-125 and installed under Contract No. C-125.

#5 @ 18" o.c. Top & Bottom

Collecting Flume (See Sh.s No. 29 & 30 for detail)

10WF49 Lateral Tie Beams

17'-6" | 17'-6"

"DIEMAH" Light duty M.H. Cover #R-6665 With Countersunk Bronze Bolts & Rubber Gasket

11'-6" x 5'-0" Top & Bottom

#5 @ 9" o.c. Top & Bottom

See Dwg. 20 for Details

10-C-24 | 10-F-24

NOTE! 1" ϕ Bolts w/2½" proj.

(Typ. dimen.)

#5 @ 18" o.c. Top & Bottom

#5 @ 12" o.c. Top & Bottom

See Dwg. 9 for HR Spacing Around Floc. Drive Motors

8 Spaces @ 1'-6" = 12'-0"

6 Flocculators

#6 @ 9" o.c. Top

#6 @ 12" o.c. Bottom

See Dwg. 27 for Openings in Floor Slab No. 3-C

PRODUCER STATION NO. 3-A

#5 @ 12" o.c. Top & Bottom

#5 @ 18" T. & B.

#5 @ 12" o.c. Top

#5 @ 15" o.c. Bottom

#5 @ 12" o.c. Top

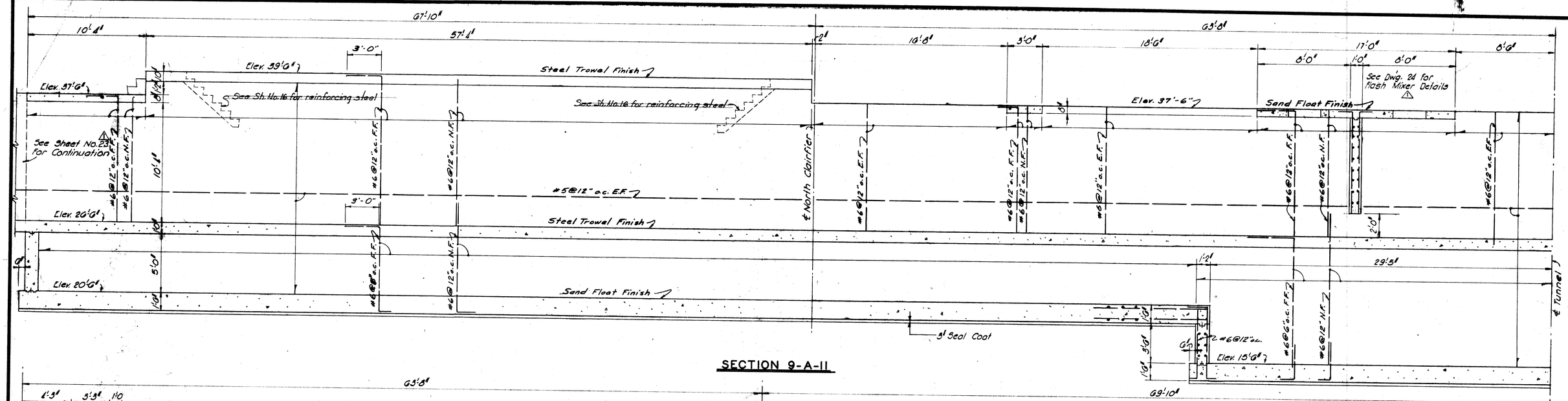
#5 @ 15" o.c. Bottom

#5 @ 12" o.c. Top

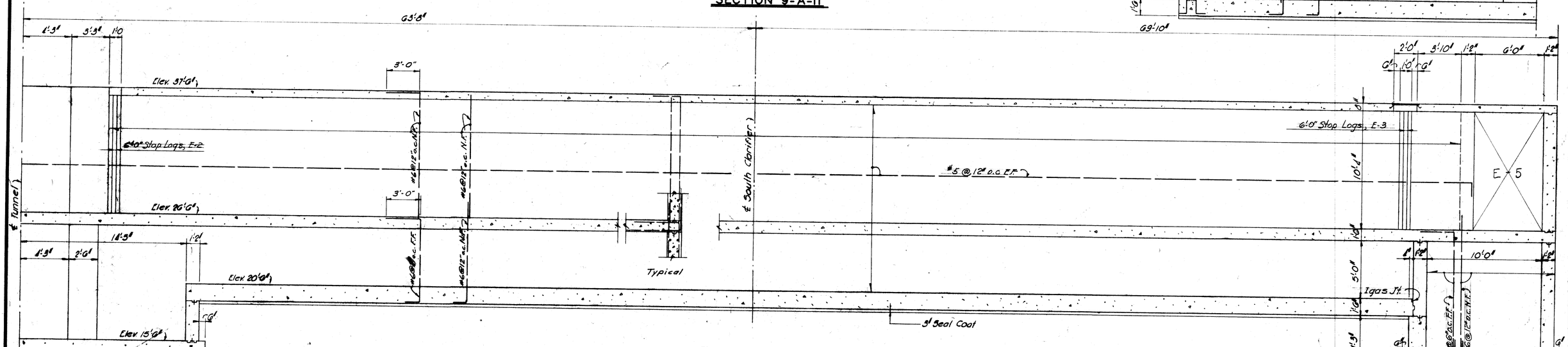
#5 @ 15" o.c. Bottom

#5 @ 12" o.c. Top

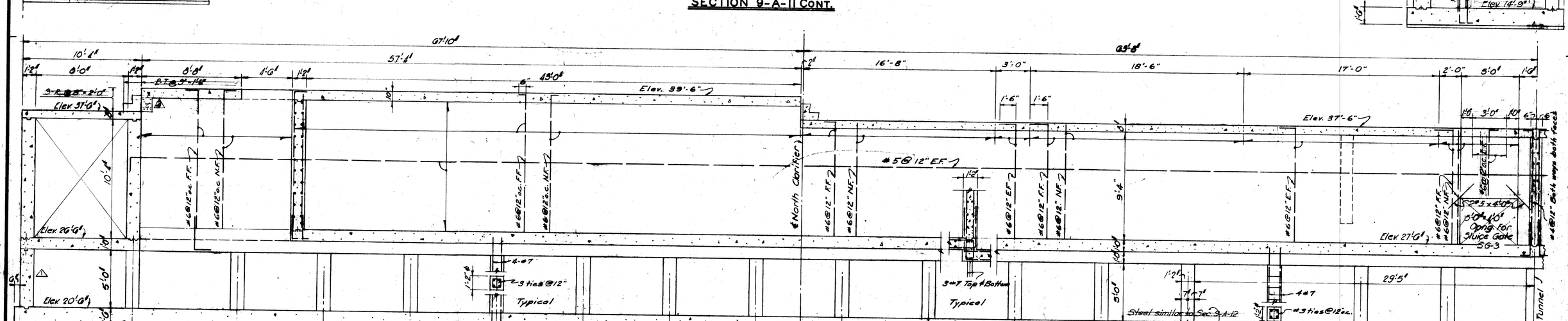
#5 @ 12



SECTION 9-A-II



SECTION 9-A-II CONT.



SECTION 9-B-II

NO	DATE	BY	REVISION
1	8-5-55	H.B.S.	Corrected 27 to read 29. ℄
			Add Flash Mixer Note On Sect. 9-A11
2	12-27-56	F.L.	As Built

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

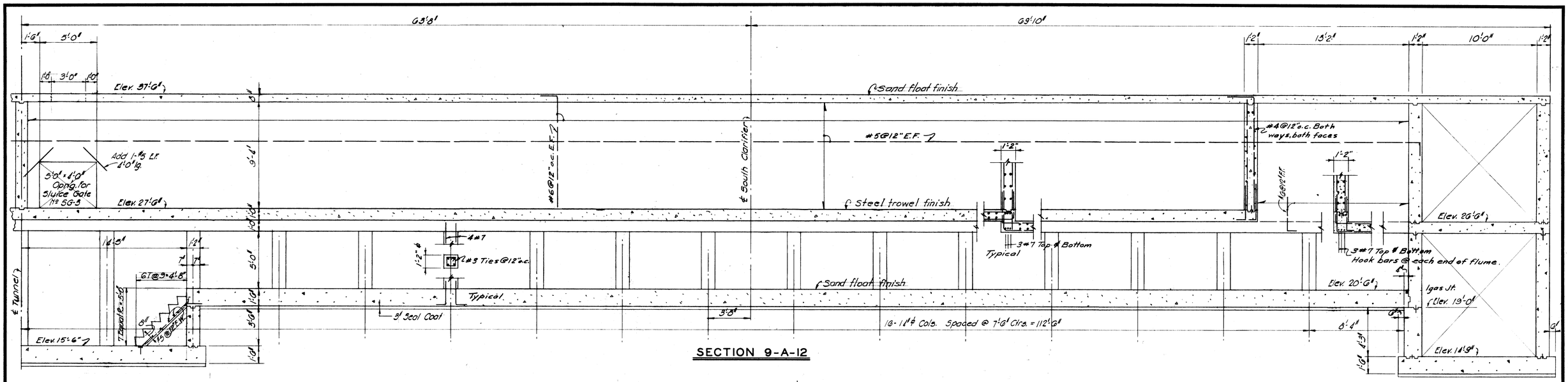
DESIGNED WHN- | TRACED
DETAILED RRF-NEW | CHECKED WHN-GBB

JOB NO. 52-340

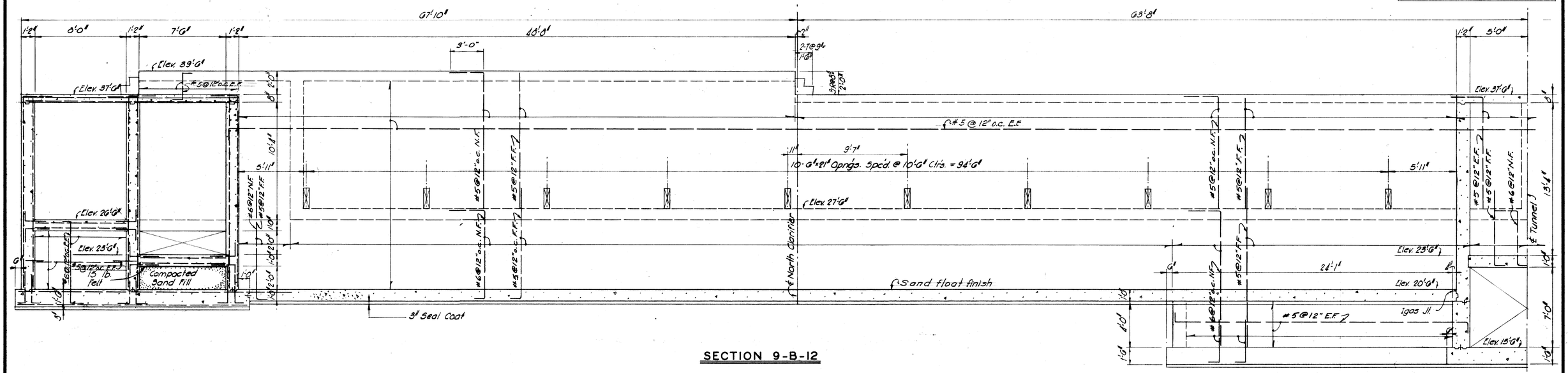
DRAWING NO. 11

SCALE 1/8"=1'-0"

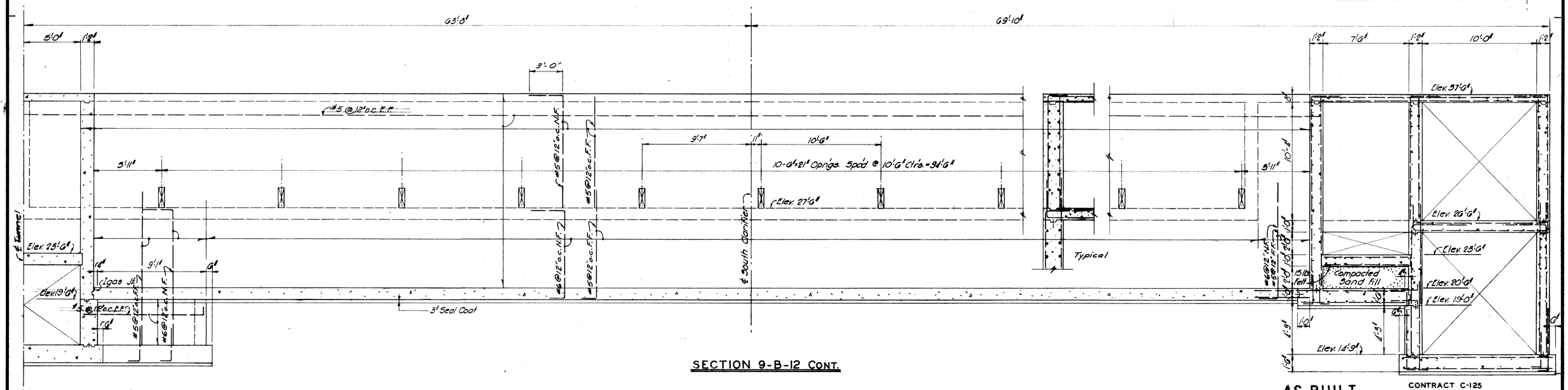
12-031 A-54 11/49



SECTION 9-A-12



SECTION 9-B-12



SECTION 9-B-12 CONT.

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.
NORTH-SOUTH BASIN CONDUITS SHEET NO. 3

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

NO	DATE	BY	REVISION
	1-3-57	F.L	As Built

STATE OF MISSOURI — GLENN E. HANDS — NUMBER 2317 — REGISTERED PROFESSIONAL ENGINEER

DESIGNED	WHH	TRACED	
DETAILED	RRF-HEW	CHECKED	WHH-CSB

JOB NO. 52-34 D

1955

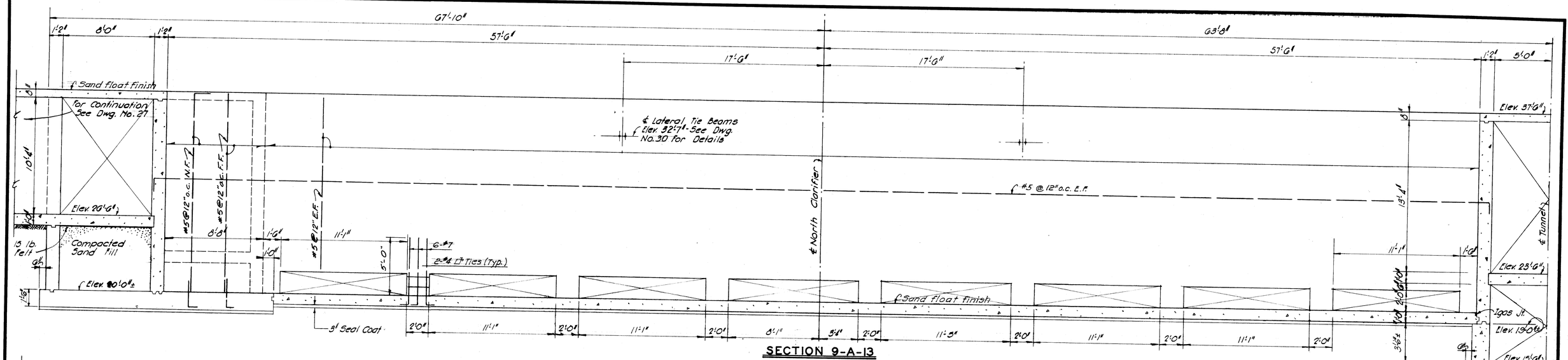
SCALE : 1/2" = 1'-0"

SHEET - REV. 12 -

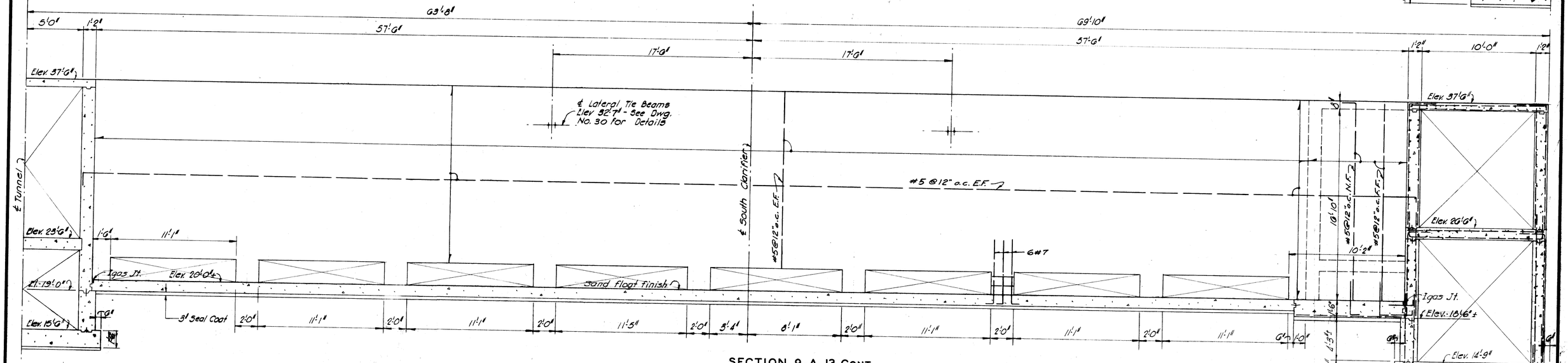
272-0314 Sh 12/29

MICROFILMED

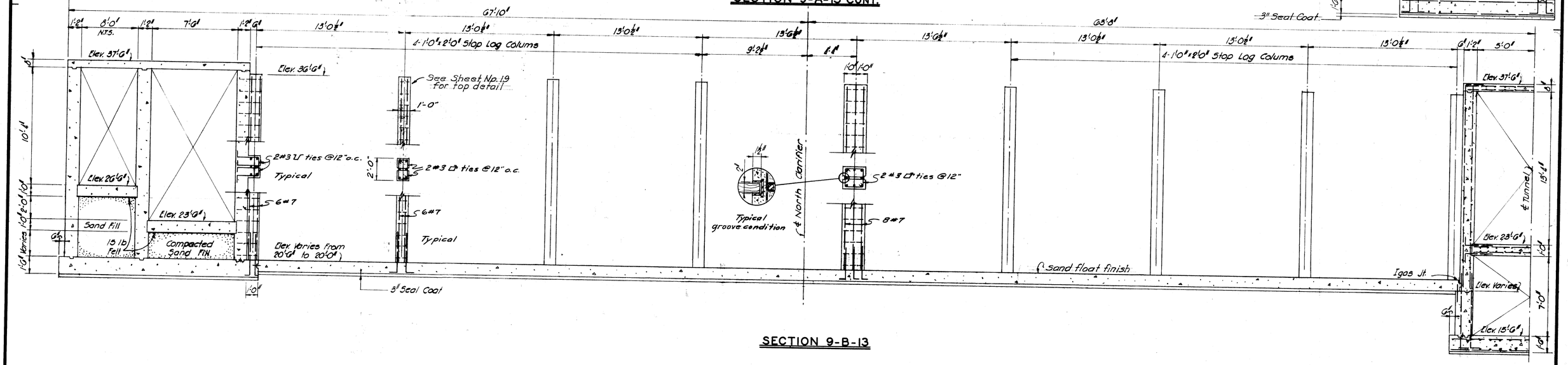
25-34D -88-



SECTION 9-A-13



SECTION 9-A-13 CONT.



SECTION 9-B-13

NO	DATE	BY	REVISION
	1-3-57	F.L	As Built

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

STATE OF MISSOURI — GLENN E. HANDS — NUMBER E-2317 — REGISTERED PROFESSIONAL ENGINEER

DESIGNED	HBA-WHH	TRACED	
DETAILED	RRF-HEW	CHECKED	WHH-CSB

JOB NO. 52-34 D

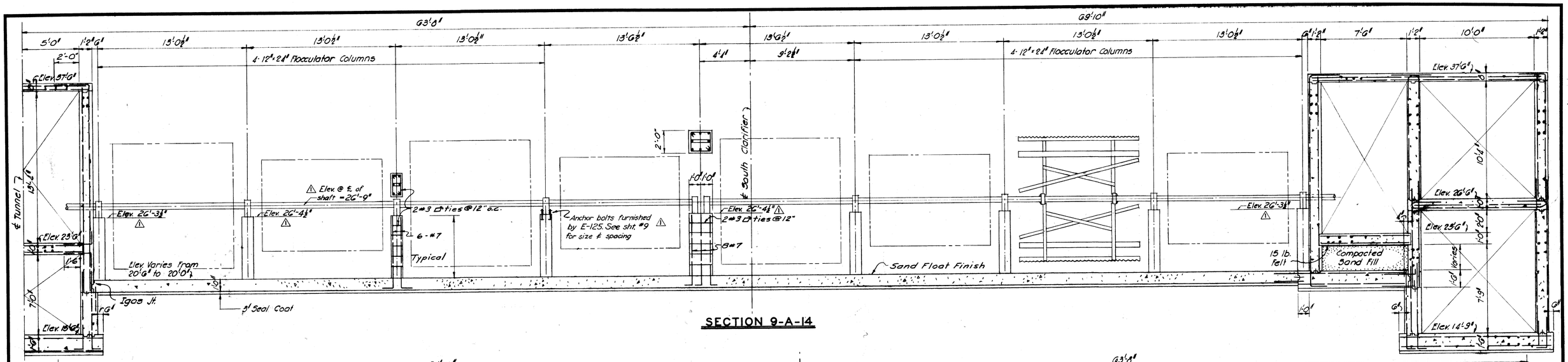
1955

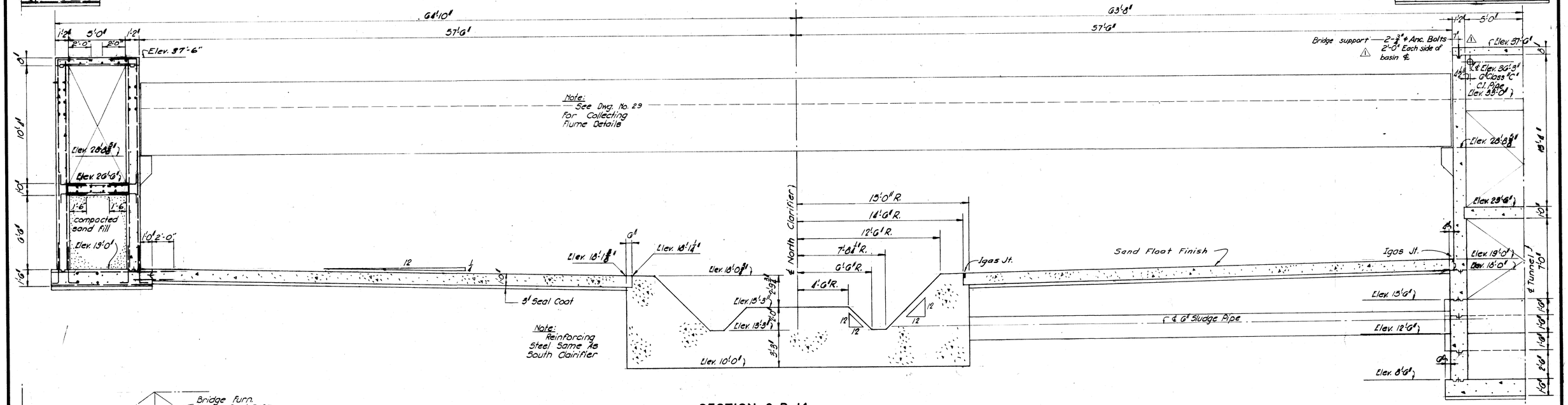
SCALE 1" = 1'-0"

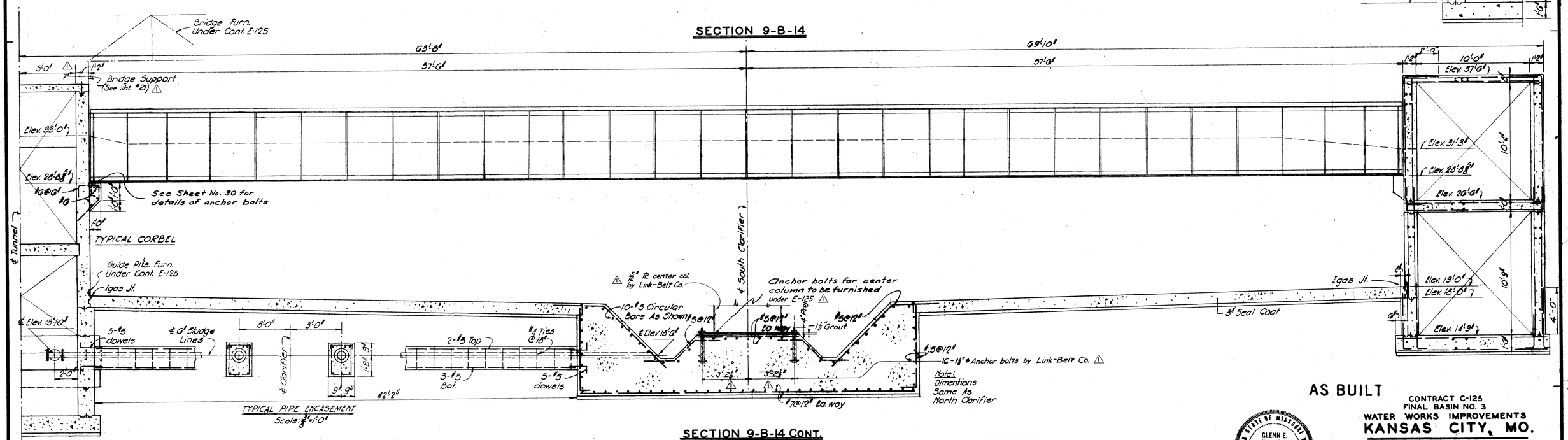
SHEET - REV. 13

5672-03/A Sh 13/49

25-34D -10-







NO	DATE	BY	REVISION
△	8-5-55	H.B.S.	Added elev. indicated, revised
℄	added notes & dimensions, & removed steps.		
	1-3-57	F.L.	As Built

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

GLENN E. HANDS — NUMBER E-2317 — REGISTERED PROFESSIONAL ENGINEER — STATE OF MISSOURI

DESIGNED	HBA	TRACED	
DETAILED	RRF-DAF	CHECKED	WHH-CSB

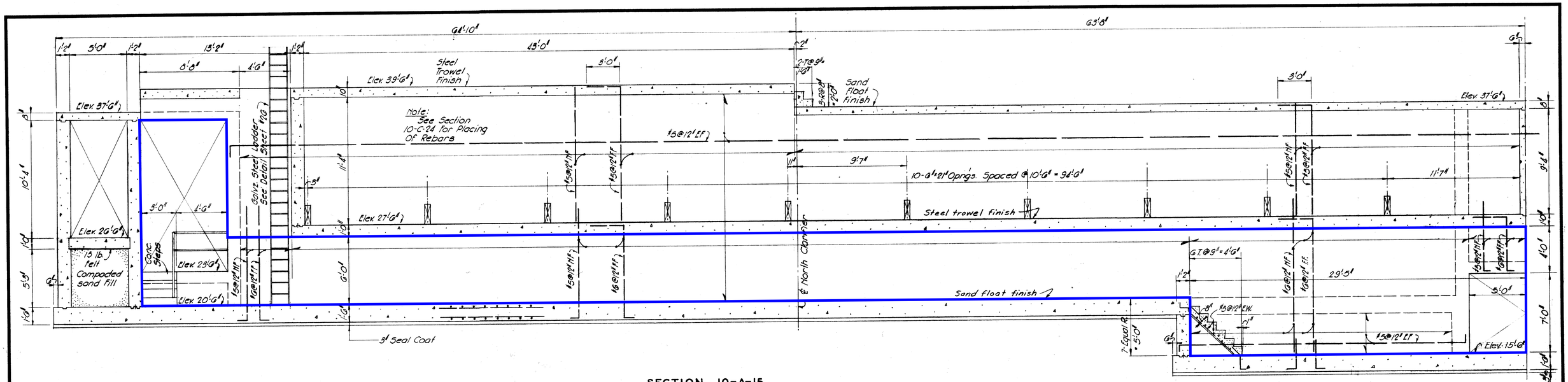
JOB NO. 52-34D

1955

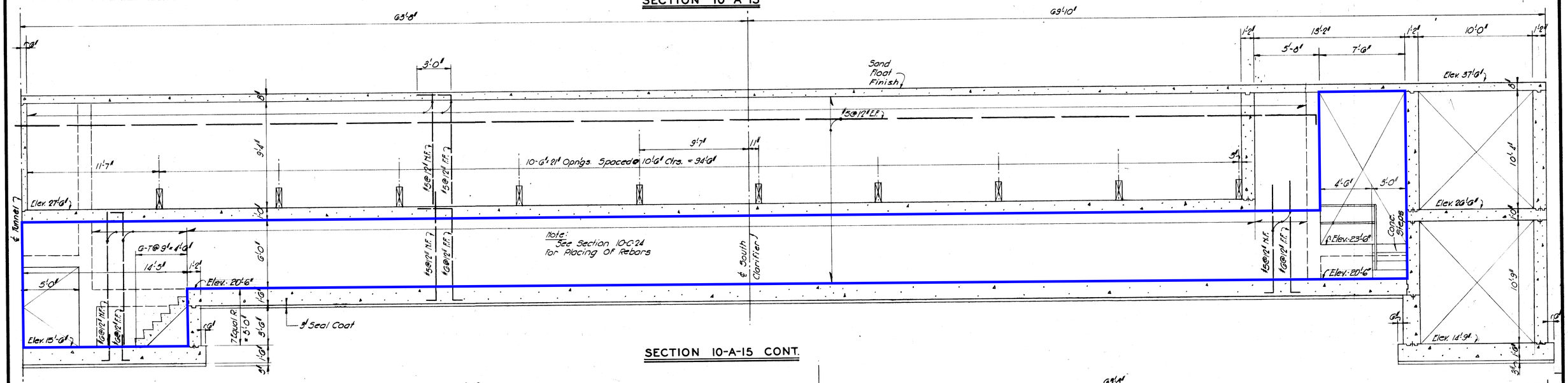
SCALE 1" = 1'-0"

SHEET NO. 14

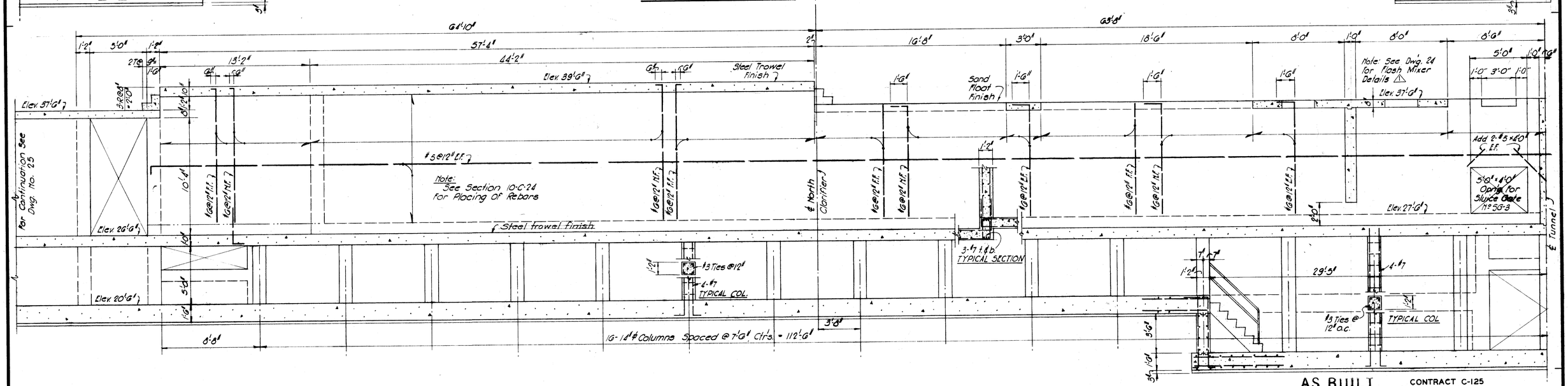
Microfilmed



SECTION 10-A-15



SECTION 10-A-15 CONT.



SECTION 10-B-15

NO.	DATE	BY	REVISION
1	8-5-55	RF	Added Flash Mixer Note
			Section 10-B-15
	1-3-57	F.L.	As Built.

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.
NORTH SIDE WATER SOFTENING SHEET NO. 5

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

GLENN E. HANDS — NUMBER E-2317 — REGISTERED PROFESSIONAL ENGINEER — STATE OF MISSOURI

DESIGNED	WHH	TRACED	
DETAILED	RRF	CHECKED	WHH-CB

JOB NO. 52-34D

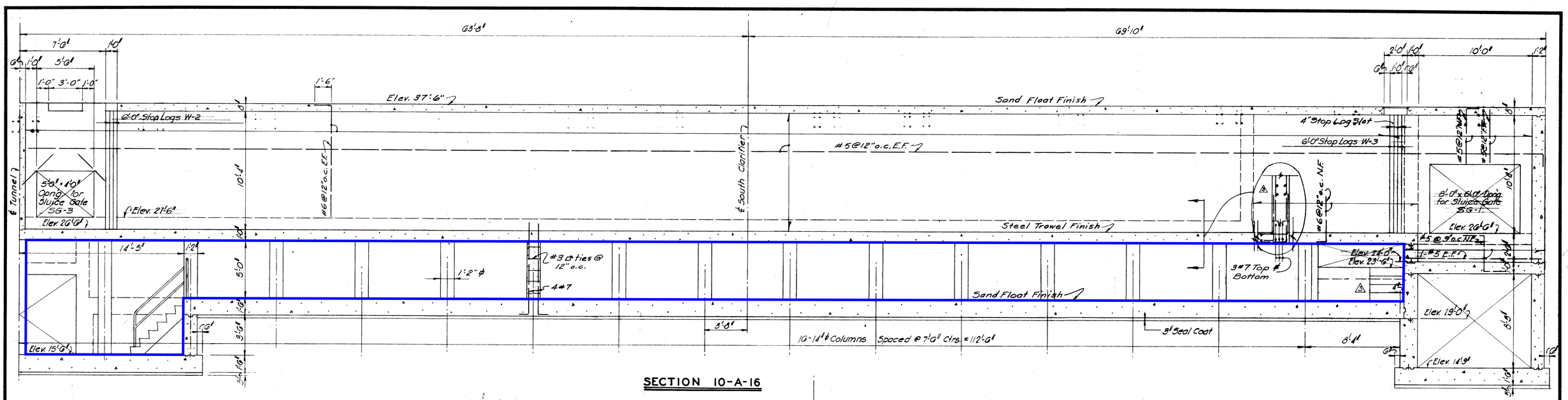
1955

SCALE : 1/4"=1'-0"

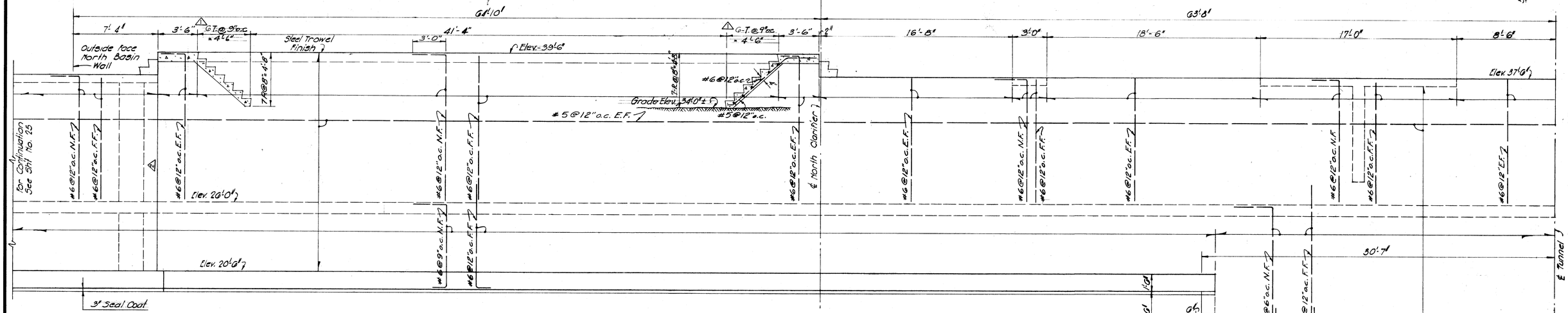
SHEET - REV. 15 - 1

5672-D 3/15/57

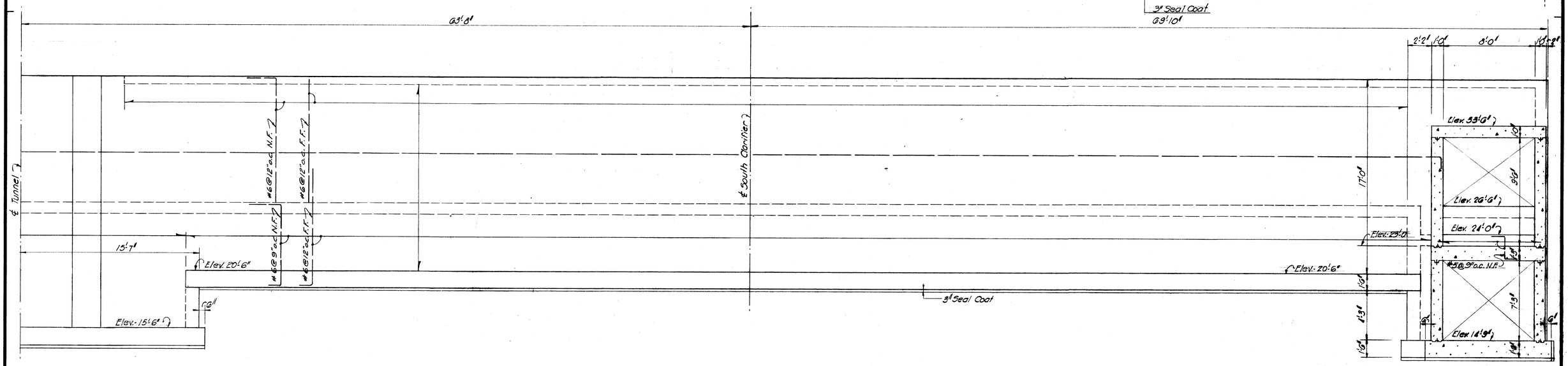
25-34D -85-



SECTION 10-A-16



SECTION 10-B-16



SECTION 10-B-16 CONT.

NO	DATE	BY	REVISION
1	8-5-55	RF	Chang 7 to 6 Treads In Sect. 10-B-16
2	8-25-55	RF	Shift N.W. Basin Inlet 2'-2½" to the West.
3	12-27-56	FL	As Built

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.
NORTHEASTERN SEWAGE DISTRICT
BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

STATE OF MISSOURI — GLENN E. HANDS — NUMBER E-2317 — REGISTERED PROFESSIONAL ENGINEER

DESIGNED	WHH	TRACED	
DETAILED	RREWER	CHECKED	WHH-CBB

JOB NO. 52-34 D

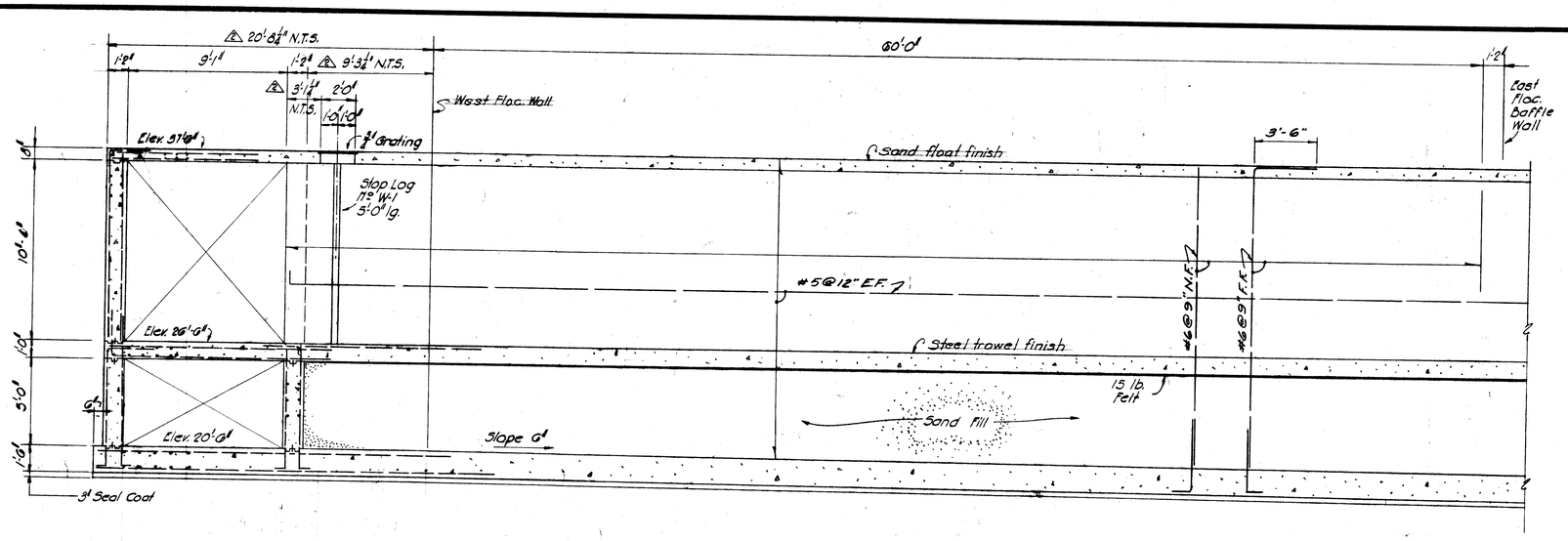
1955

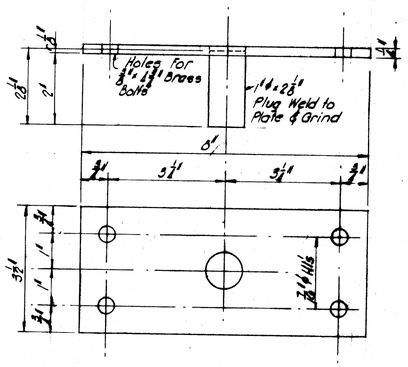
SCALE : 1/4"-1'-0"

SHEET - REV. 10 - 2

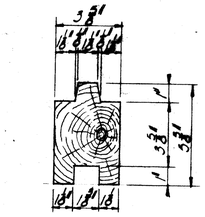
25-34D -23-

25-34D -23-



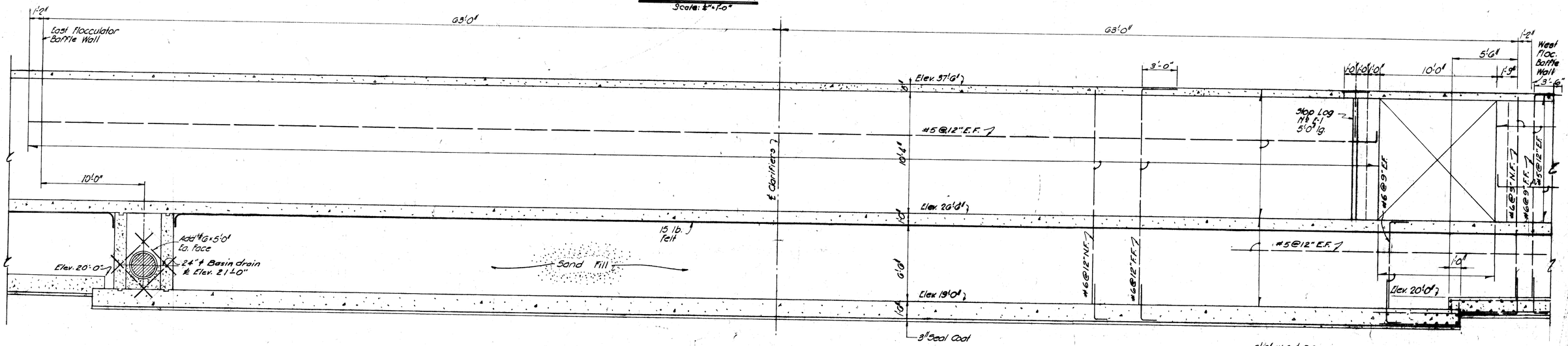


TYP STOP LOG PLATE
Scale: 6"=1'-0"

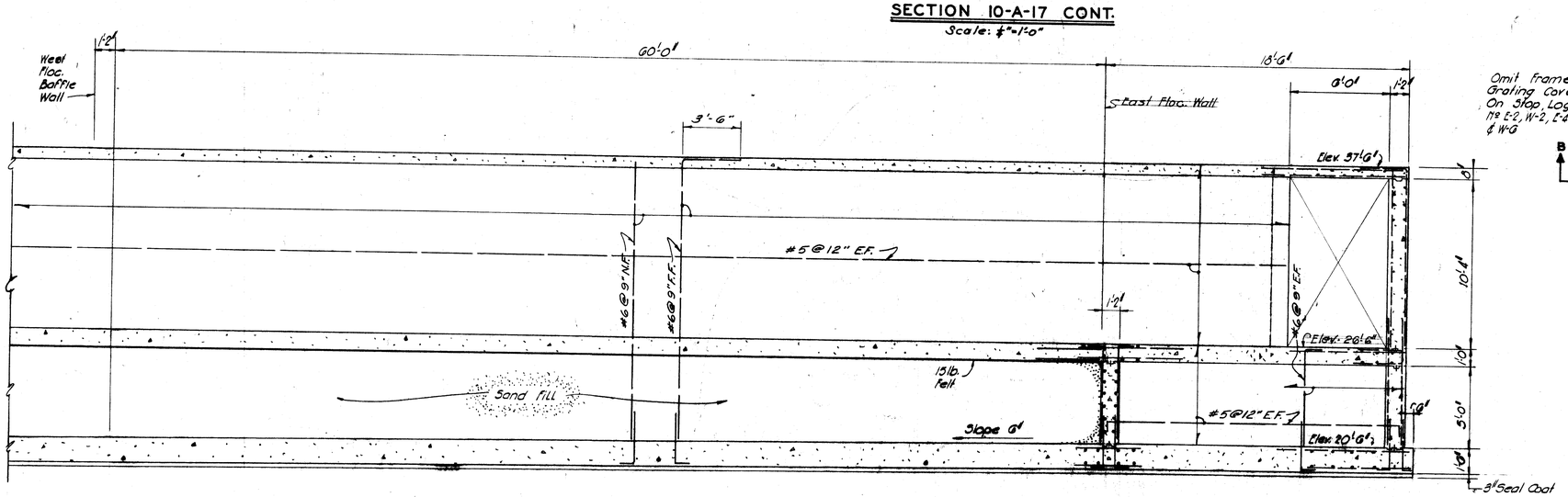


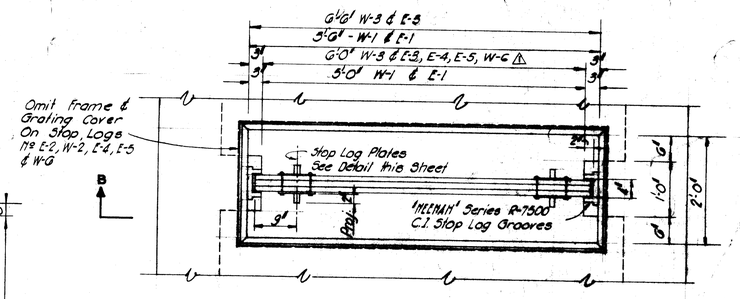
TYPICAL SECTION THRU STOP LOG
Scale: 3"=1'-0"

SECTION 10-A-17
Scale: ¼"=1'-0"



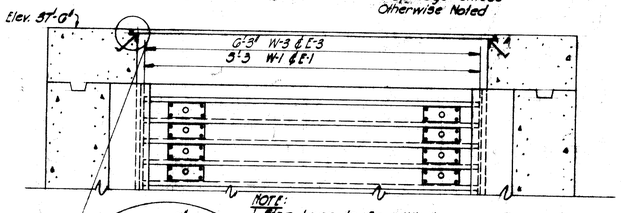
SECTION 10-A-17 CONT.
Scale: ¼"=1'-0"



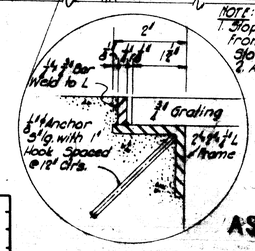


PLAN

Note: Typical for All Stop Logs Unless Otherwise Noted



Note:
1. Stop Logs to be Milled From 4"x6" clear Cypress Stock
2. All Angle Frames & Grating to be Galv.



SECTION B

STOP LOG DETAILS
Scale: 1"=1'-0"

SECTION 10-A-17 CONT.
Scale: 1"=1'-0"

NO.	DATE	BY	REVISION
⚠1	8-5-55	H.B.S.	Added E-4, E-5, W-6.
⚠2	8-25-55	R.F.	Shift N.W. Basin Inlet 2'-2½" to the West.
	1-3-57	F.L.	As Built.

STATE OF MISSOURI
GLENN E. HANDS
NUMBER E-2317
REGISTERED PROFESSIONAL ENGINEER

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

AS BUILT

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

DESIGNED — DRAWN — TRACED — CHECKED
DETAILED — CHECKED — QUANTITIES — CHECKED

JOB NO. 25-34D

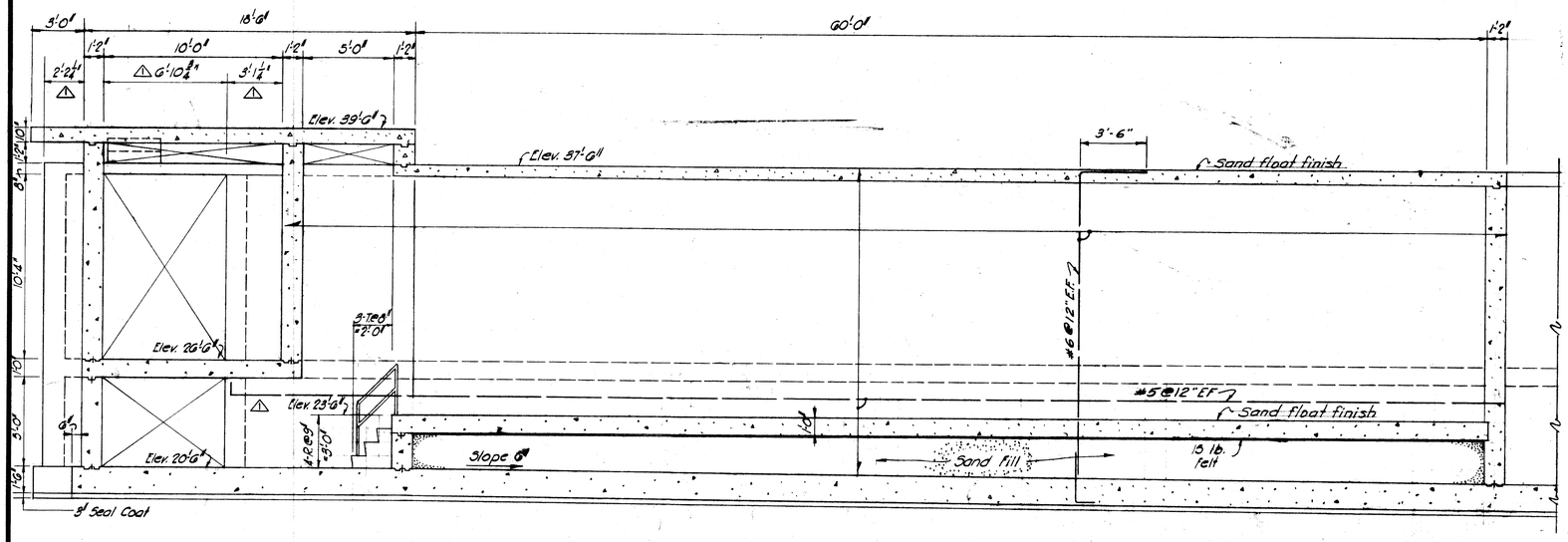
1955

SHEET NO. 17

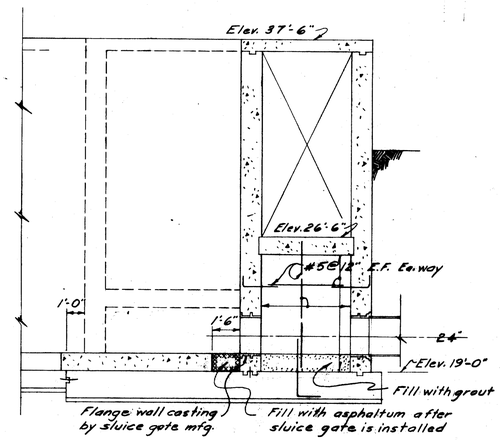
SCALE: 1 AS SHOWN

MICROFILMED

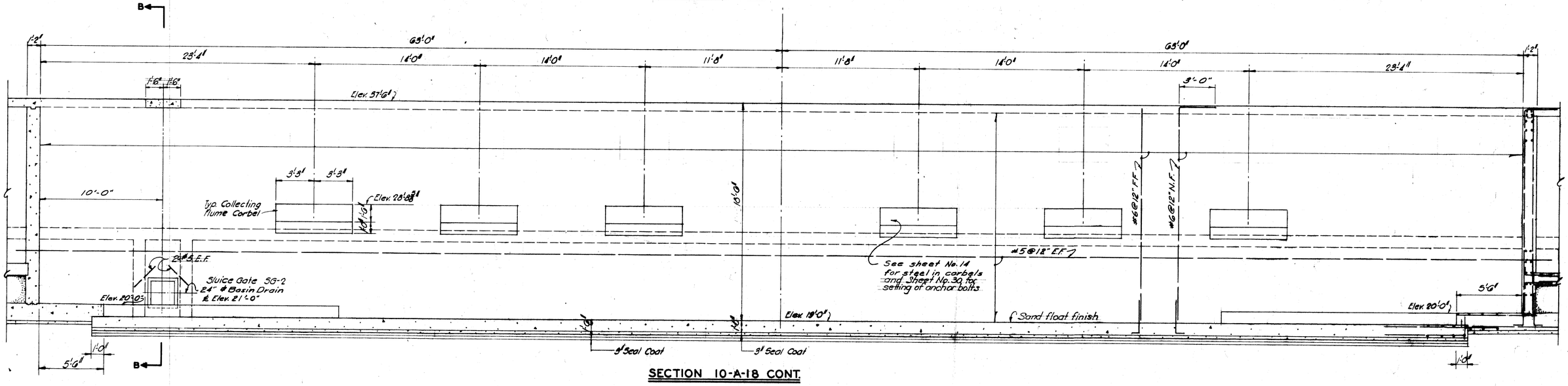
25-340 -4-



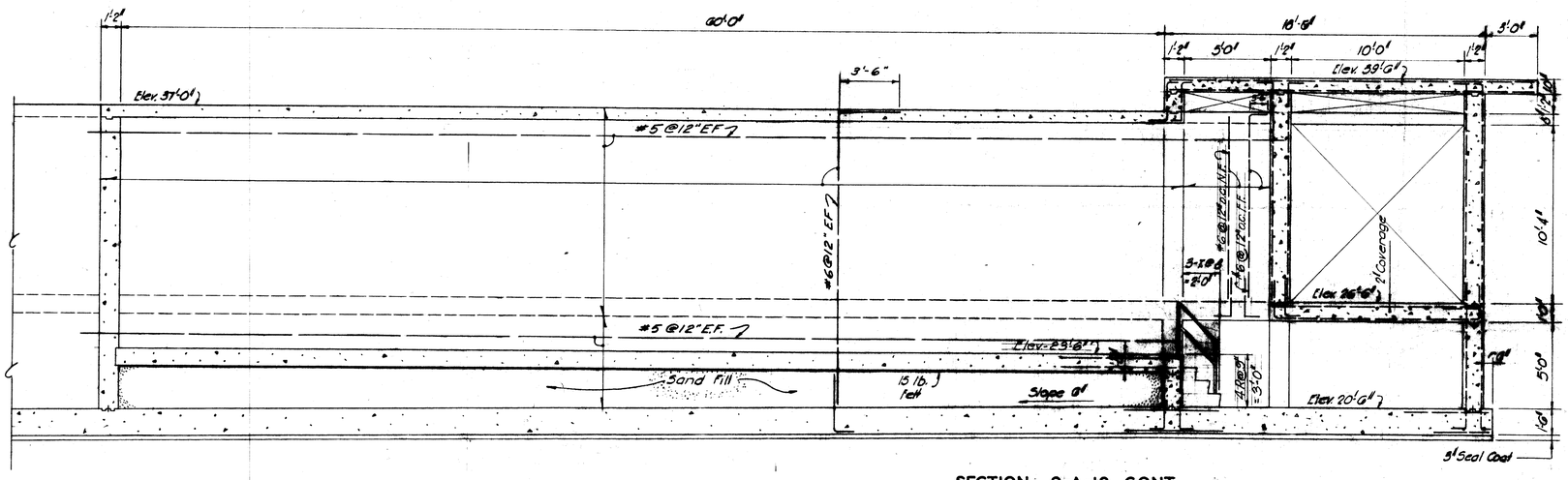
SECTION 10-A-18



SECTION B-B



SECTION 10-A-18 CONT.



SECTION 9-A-18 CONT.

NO	DATE	BY	REVISION
1	8-25-55	R.P.	Shift N-W Basin Inlet 2'2½" to the West
	1-3-57	F.L.	As Built

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

1955

GLENN E. HANDS — NUMBER E-2317 — REGISTERED PROFESSIONAL ENGINEER — STATE OF MISSOURI

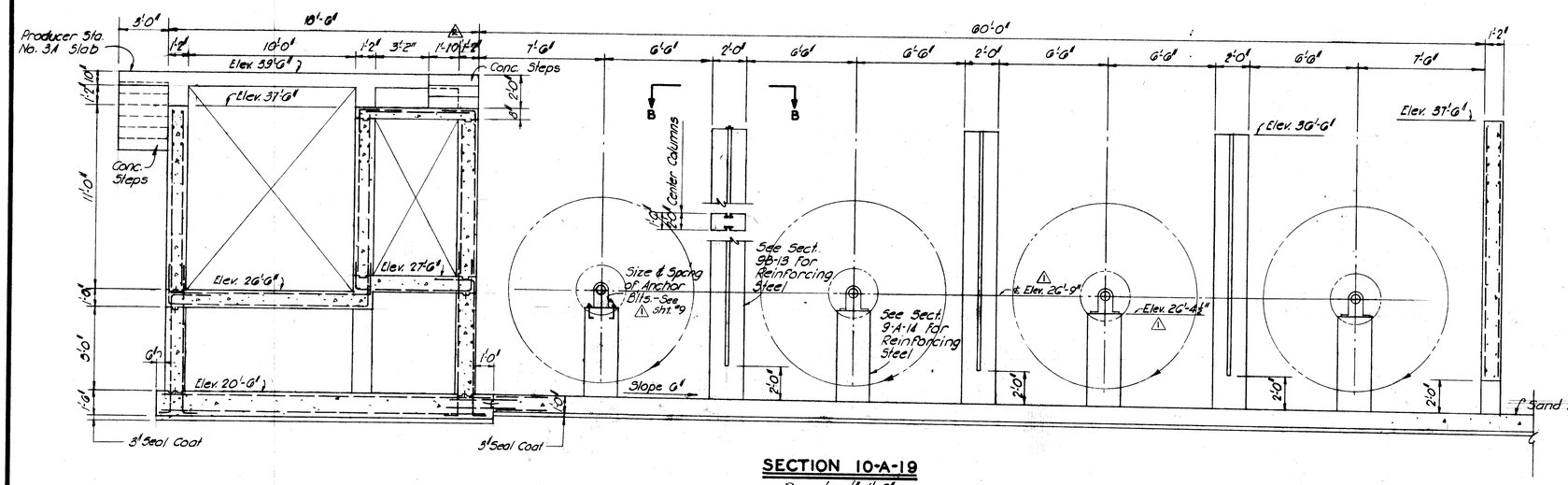
DESIGNED C.E.S.-W.H.H.
DETAILED R.M.F.-H.E.V. WHH-C.E.S.

JOB NO. 52-340

SCALE: 1/8" & 1/4"-0"

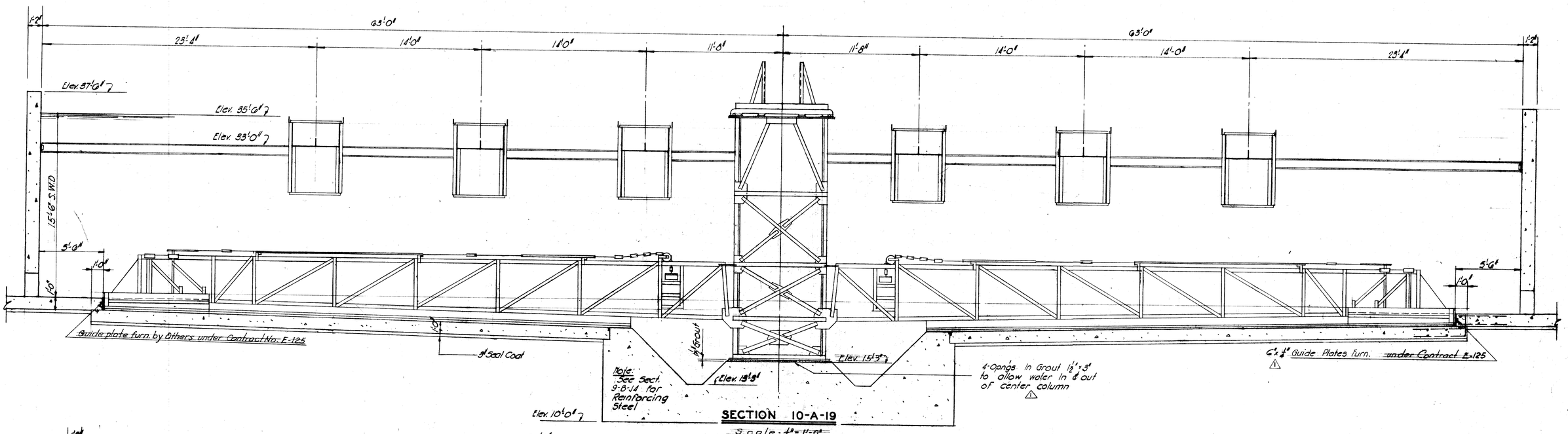
SHEET NO. 4

25-340 -22-

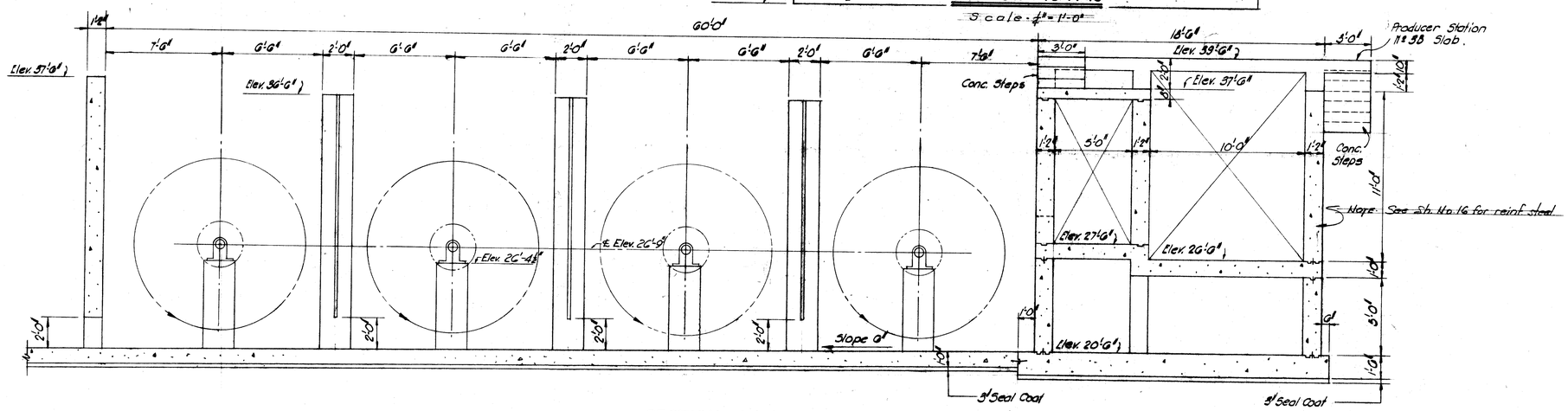


SECTION 10-A-19
Scale - 1" = 1'-0"

SECTION B
Scale - 1½" = 1'-0"



SECTION 10-A-19
Scale - ¼" = 1'-0"



SECTION 9-A-19 CONT.
Scale - ¼" = 1'-0"

NO	DATE	BY	REVISION
1	8-5-55	H.B.S.	Added elevations indicated # inserted 6"x½" in guide plate note.
2	12-27-56	F.L.	As Built

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

GLENN E. HANDS
NUMBER E-2317
REGISTERED PROFESSIONAL ENGINEER
STATE OF MISSOURI

DESIGNED HBS | TRACED | CHECKED | 1955
DETAILED BMcF | CHECKED WHC-FB

JOB NO. 52-340

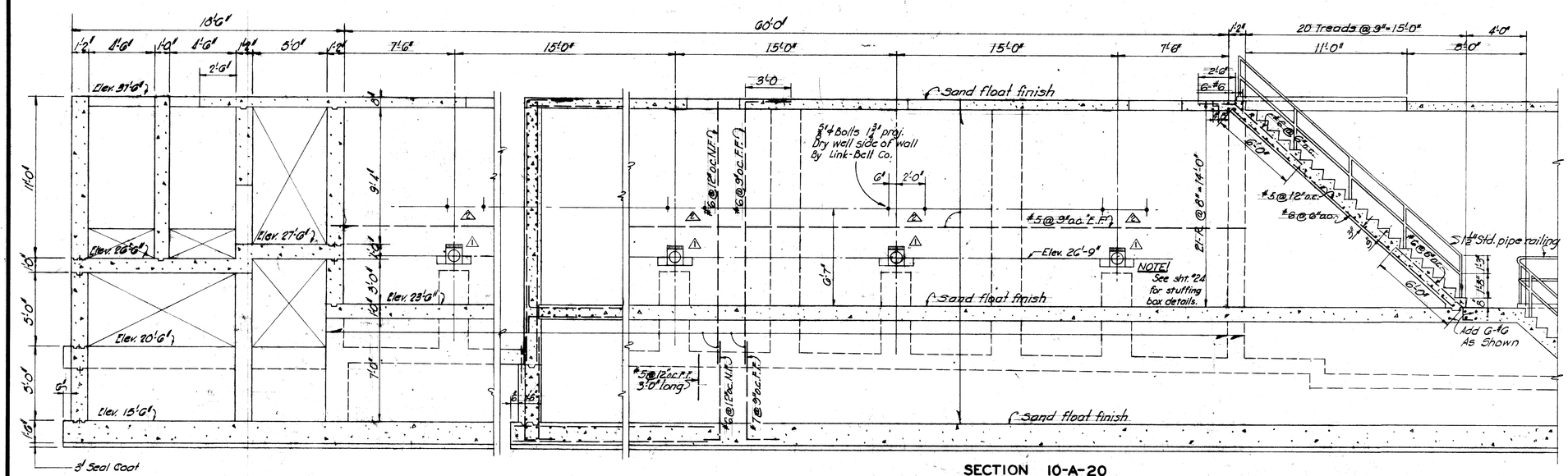
SCALE : AS SHOWN

SHEET

D 31456

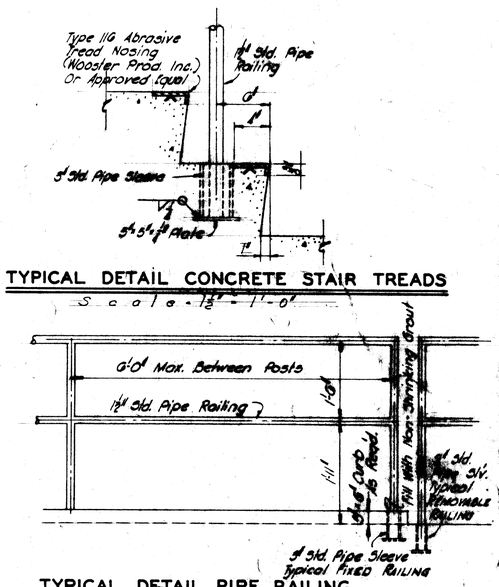
25-390 -dp-

25-390 -dp-



SECTION 10-A-20

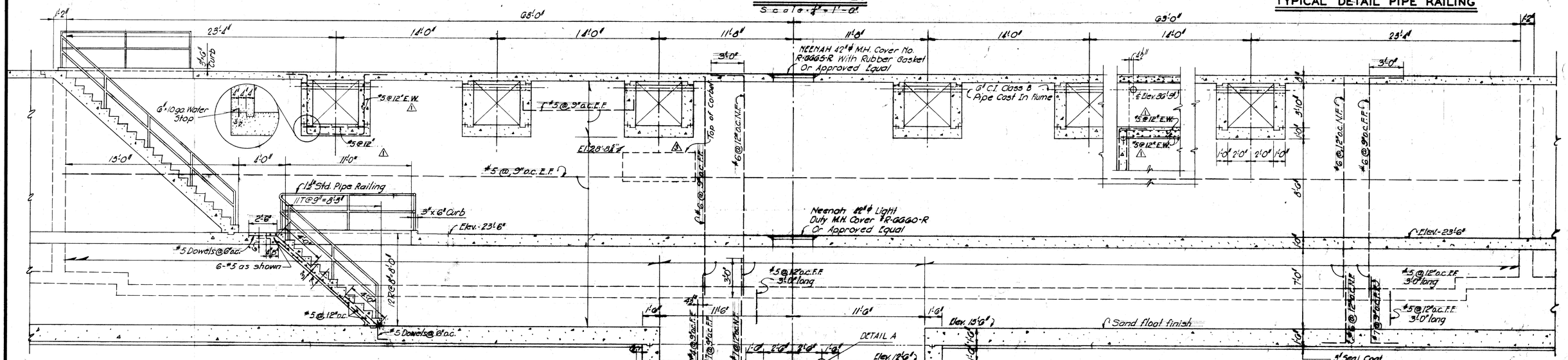
Scale: 1/4" = 1'-0"



TYPICAL DETAIL CONCRETE STAIR TREADS

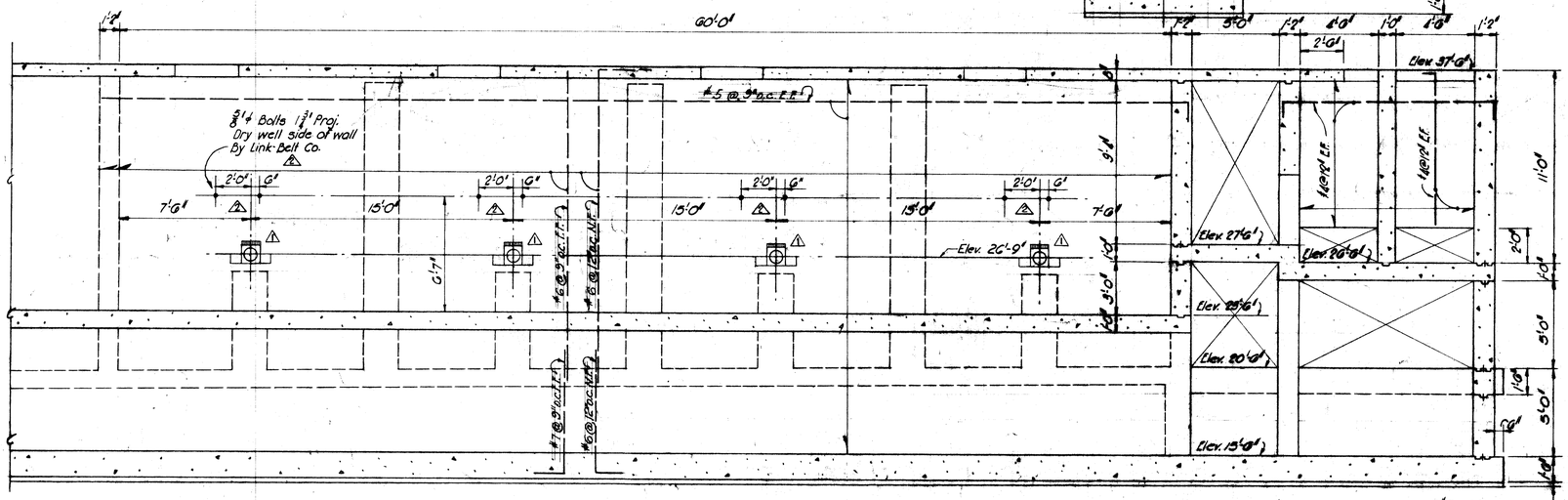
Scale: 1 1/2" = 1'-0"

TYPICAL DETAIL PIPE RAILING



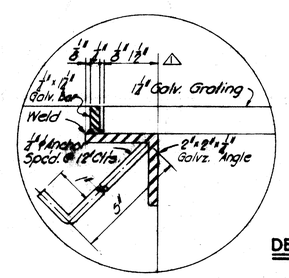
SECTION 10-A-20 CONT.

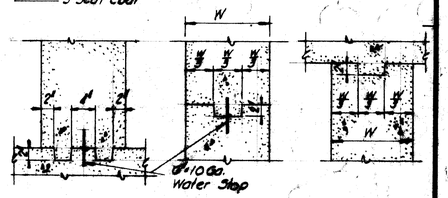
Scale: 1/4" = 1'-0"



SECTION 9-A-20 CONT.

Scale: 1" = 1'-0"

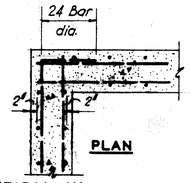




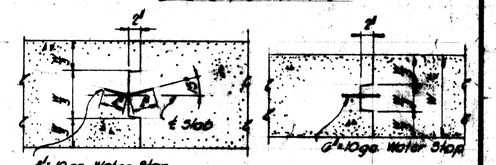
DETAIL HORIZONTAL CONSTRUCTION JOINTS

Scale: 1" = 1'-0"

DETAIL A

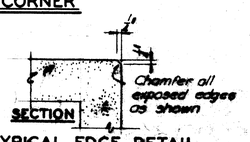


TYPICAL WALL CORNER



DETAIL VERTICAL CONSTRUCTION JOINTS

Scale: 1" = 1'-0"



TYPICAL EDGE DETAIL

GLENN E. HANDS NUMBER E-2317 REGISTERED PROFESSIONAL ENGINEER STATE OF MISSOURI

NO.	DATE	BY	REVISION
1	8-5-55	W.B.S.	Noted "5@12" E.W. & added stuffing boxes.
2	8-25-55	R.T.	Add Chain Guard Bolts
3	12-27-56	F.L.	As Built

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

AS BUILT

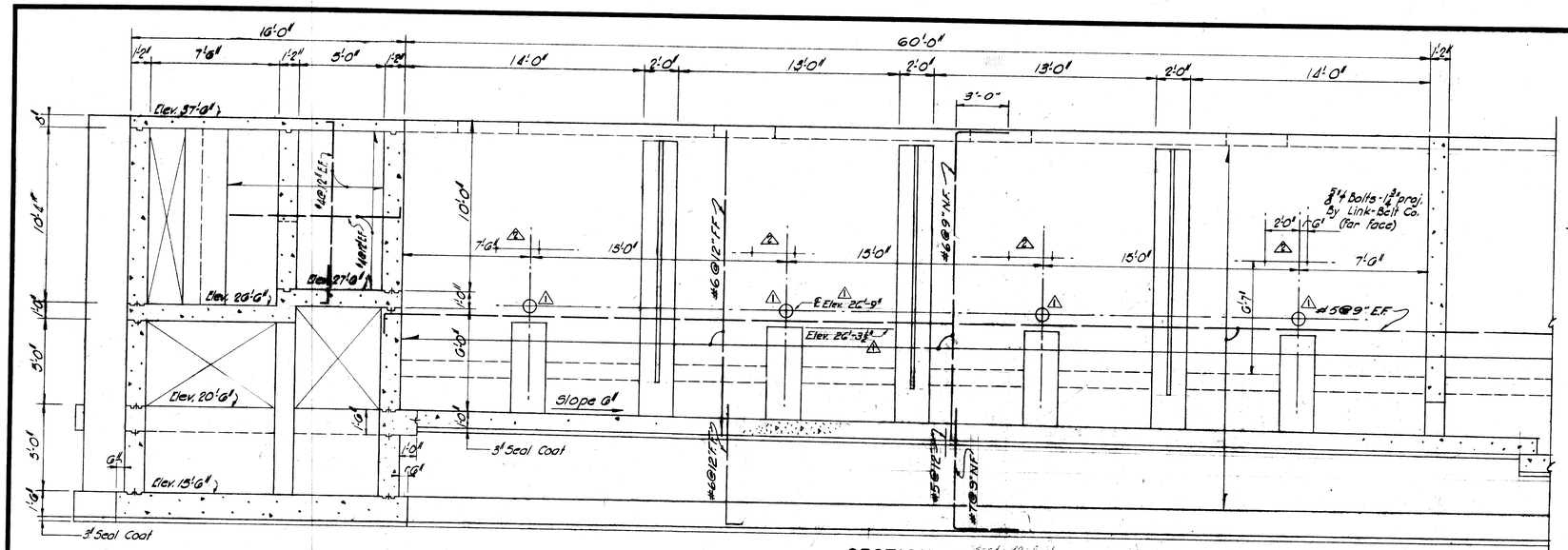
1956

JOB NO.

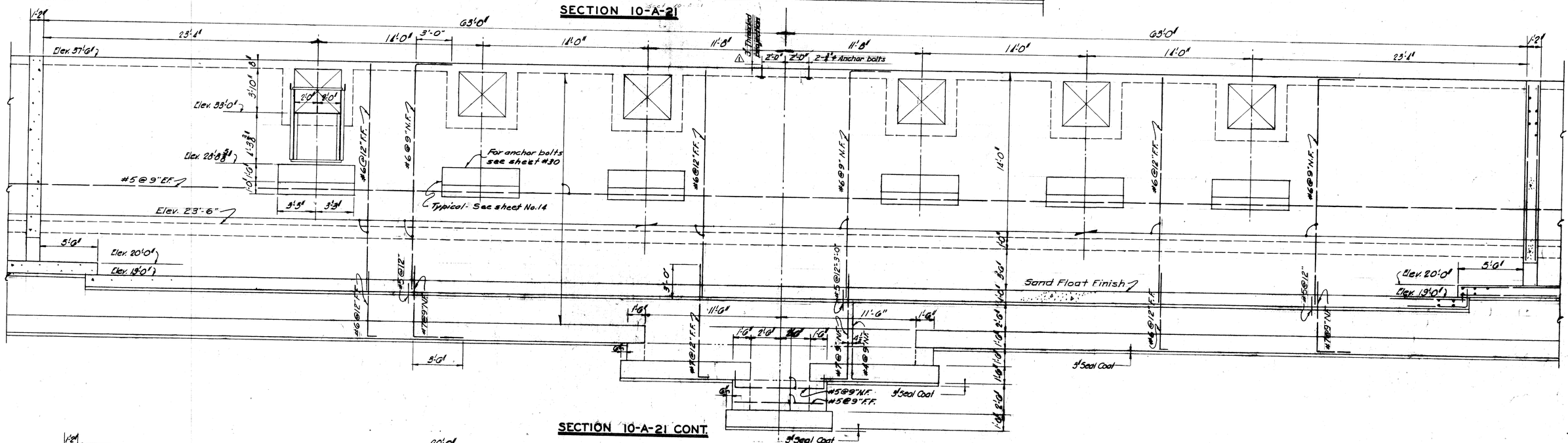
SHEET NO.

SCALE 1" = 1'-0"

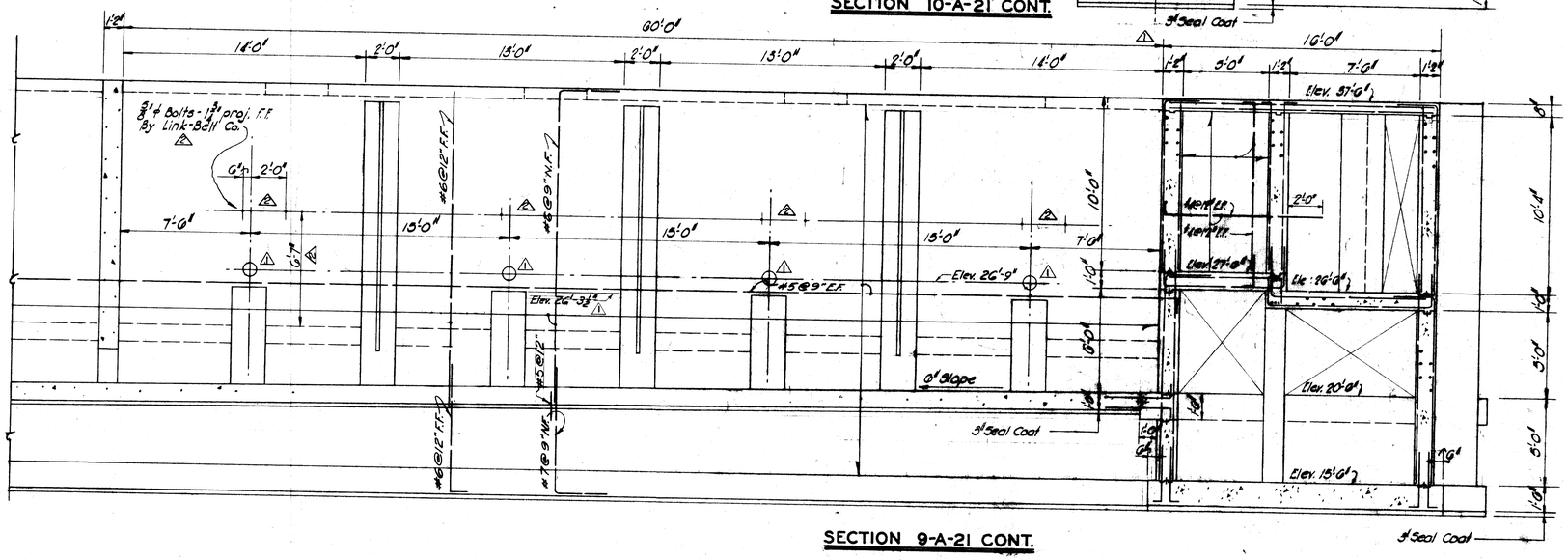
25-340 -21-



SECTION 10-A-21



SECTION 10-A-21 CONT.



SECTION 9-A-21 CONT.

NO.	DATE	BY	REVISION
1	8-5-55	H.B.S.	Added elevations indicated, added note, & inserted anchor bolts, & added holes in walls for mixer shafts.
2	8-25-55	R.F.	Added Floc. Chain Guard Bolts in Dry Wells
	1-3-57	F.L.	As Built

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

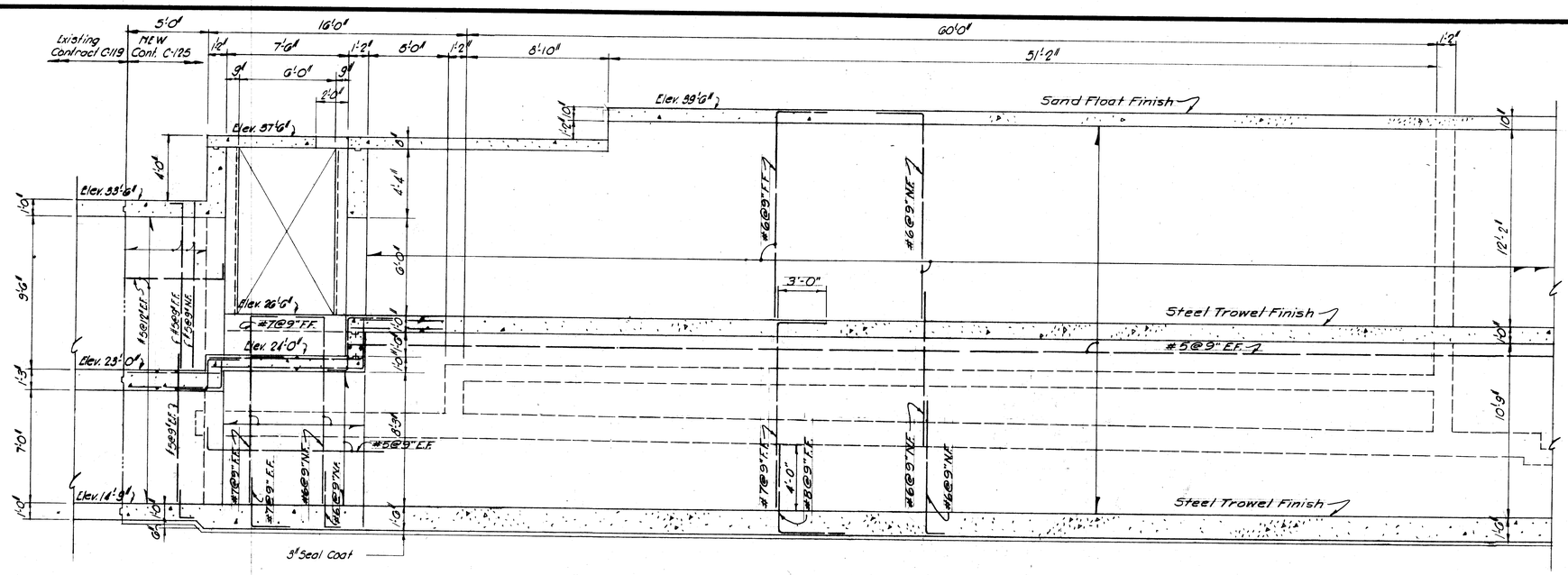
BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

1955

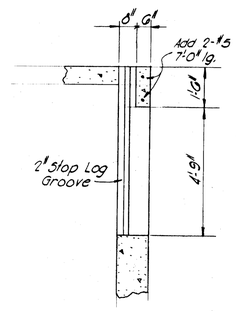
GLENN E. HANDS NUMBER E-2317 REGISTERED PROFESSIONAL ENGINEER STATE OF MISSOURI

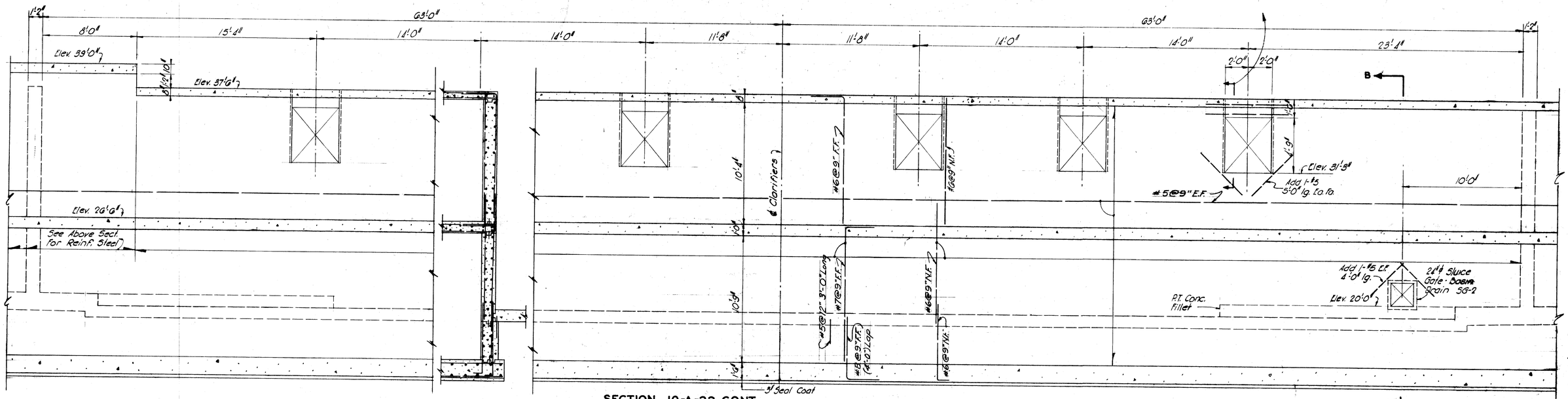
SHEET NO. 5672-D-3/A 2/69

25-340 -88-

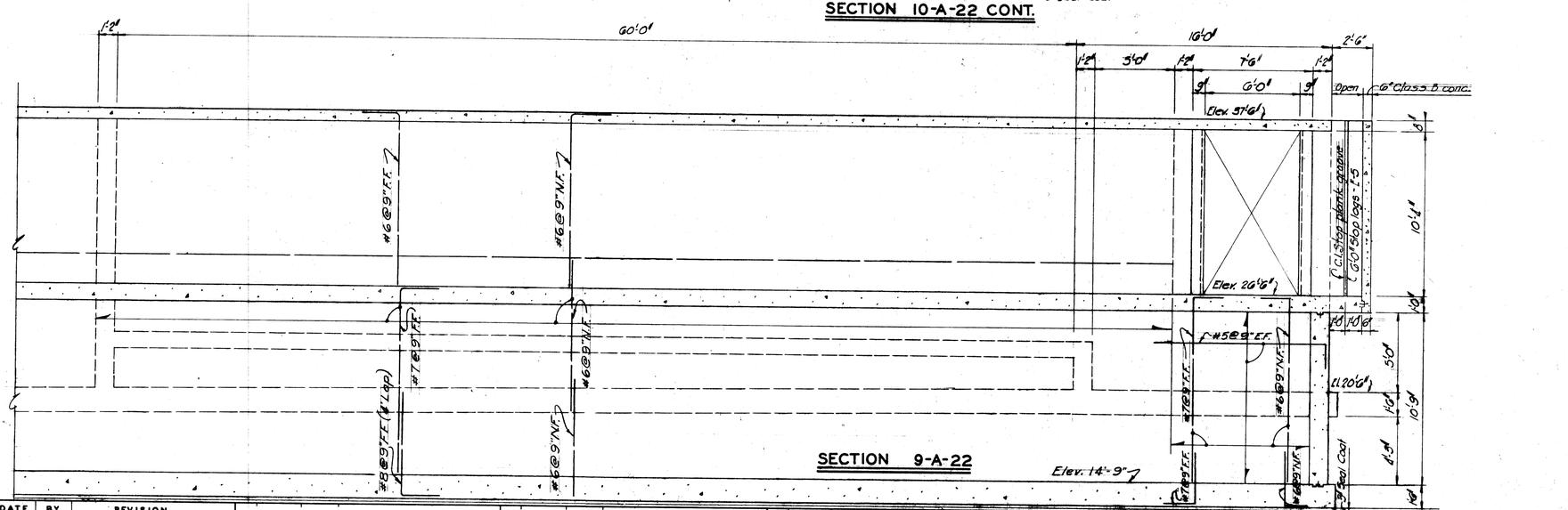


SECTION 10-A-22

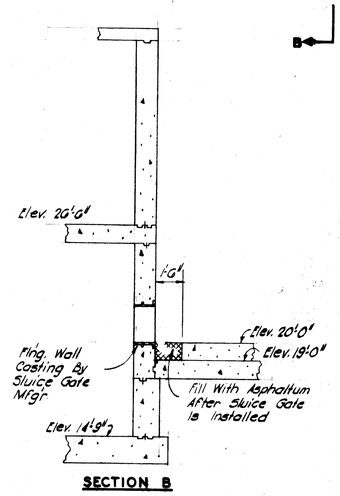




SECTION 10-A-22 CONT.



SECTION 9-A-22



SECTION B

NO	DATE	BY	REVISION
	1-3-57	F.L.	As Built.

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

GLENN E. HANDS NUMBER E-2317 REGISTERED STATE OF MISSOURI PROFESSIONAL ENGINEER

AS BUILT

DESIGNED	HBA	TRACED	
DETAILED	RRF-NEW	CHECKED	WHH-CSB

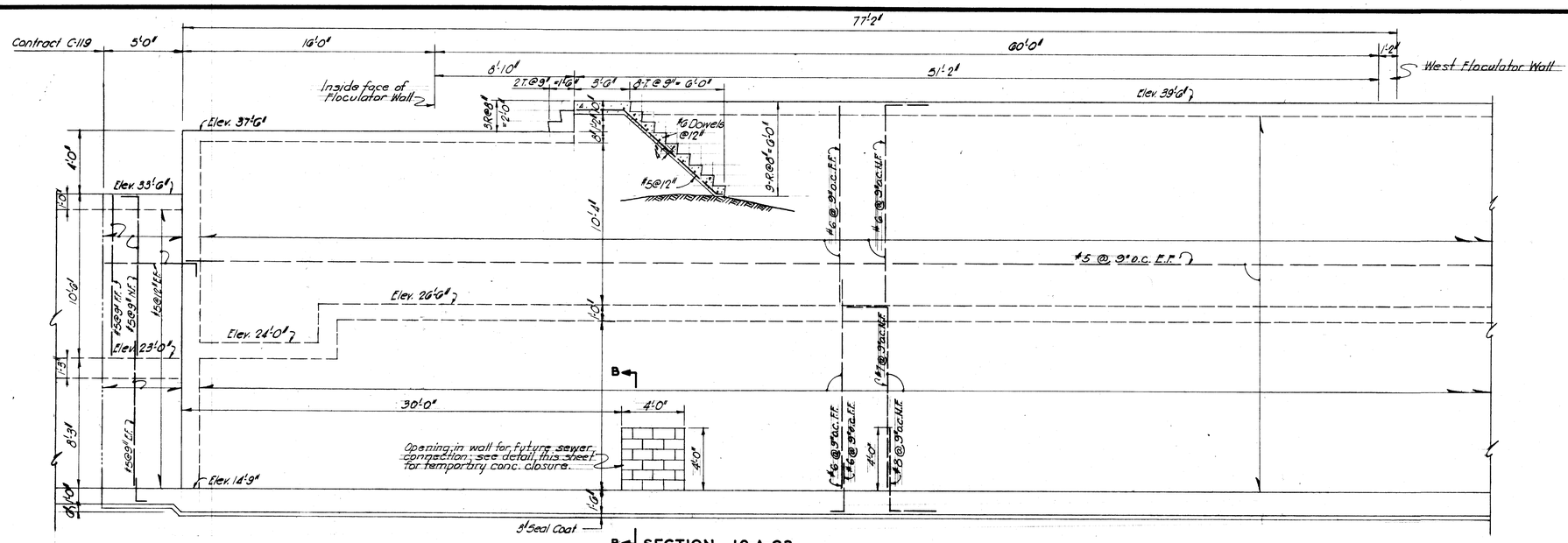
JOB NO. 58-340

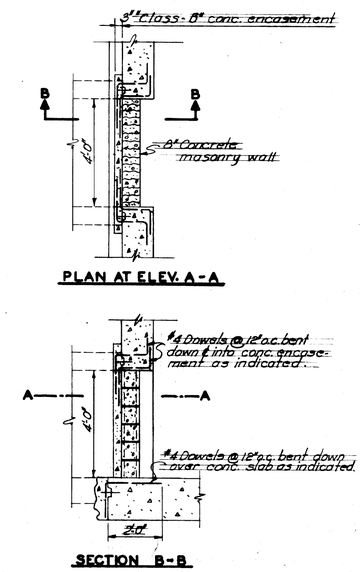
1955

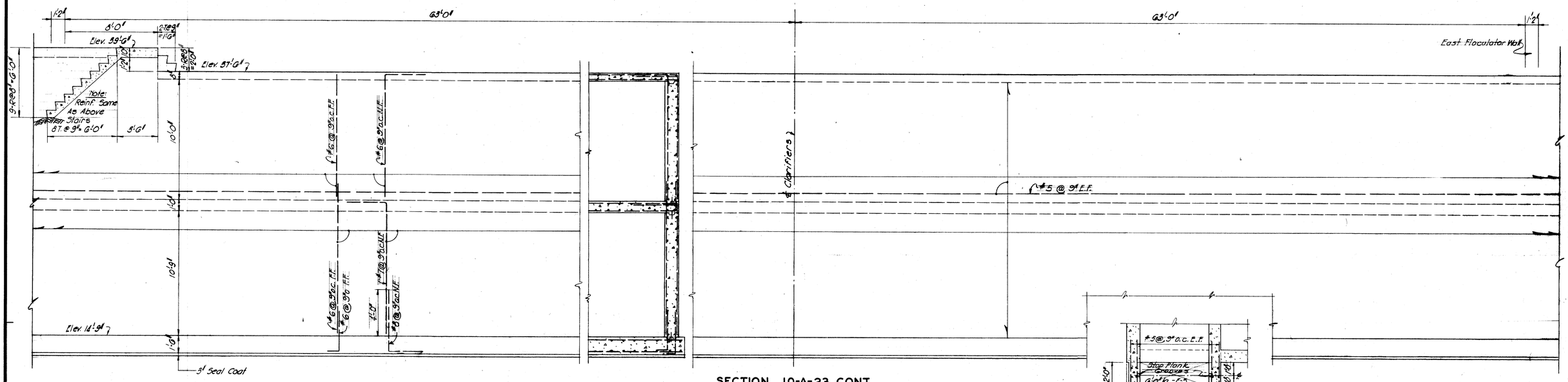
SCALE 1 INCH = 1'-0"

SHEET NO.

72-031A 339







NO	DATE	BY	REVISION
	1-3-57	F.L.	As Built.

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

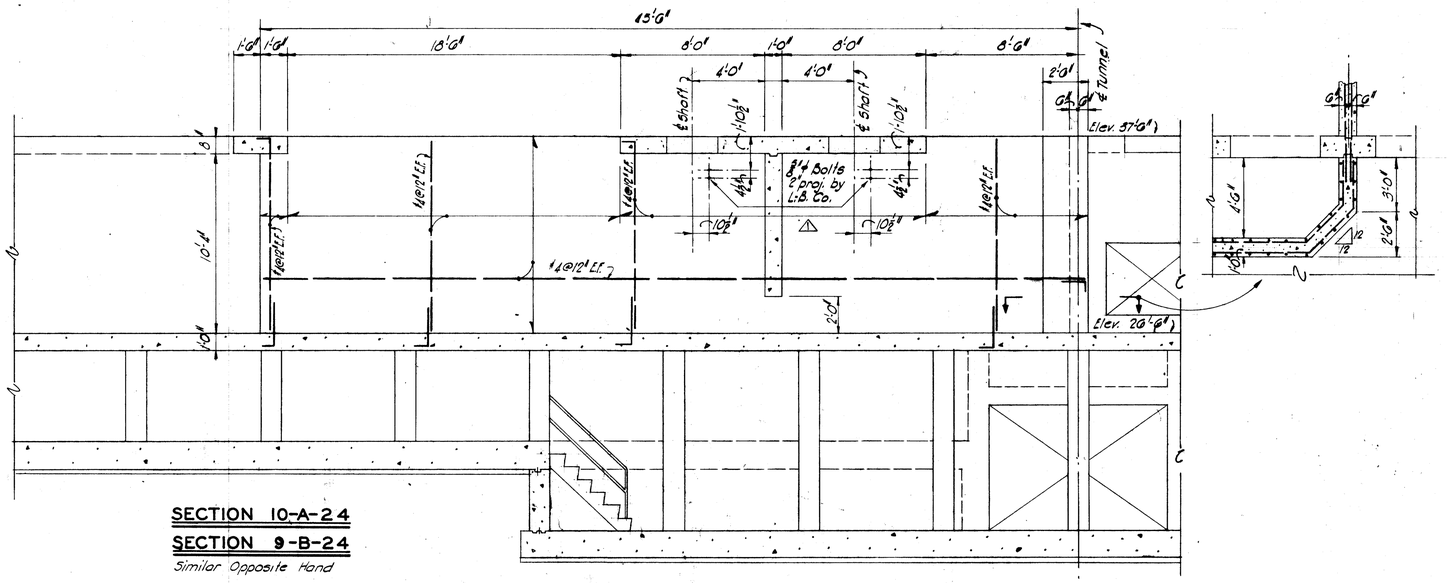
BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

GLENN E. HANDS — NUMBER E-2317 — REGISTERED PROFESSIONAL ENGINEER — STATE OF MISSOURI

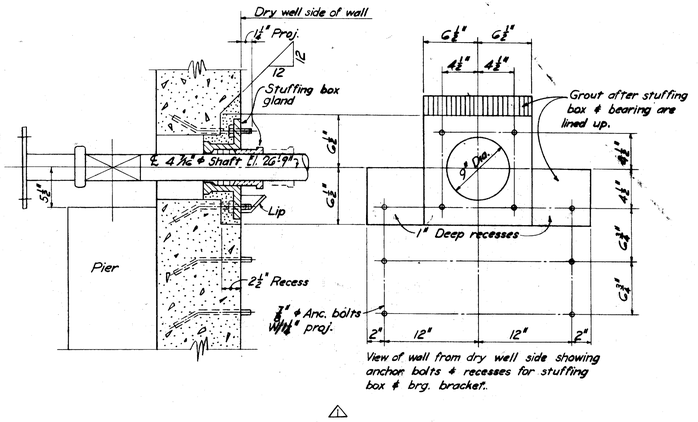
DESIGNED	WHH-HBA	TRACED		JOB NO.	52-34D
DETAILED	RKF-DAF	CHECKED	WHH-CBB	SCALE	1 AS SHOWN

DATE 1958
SHEET NO.

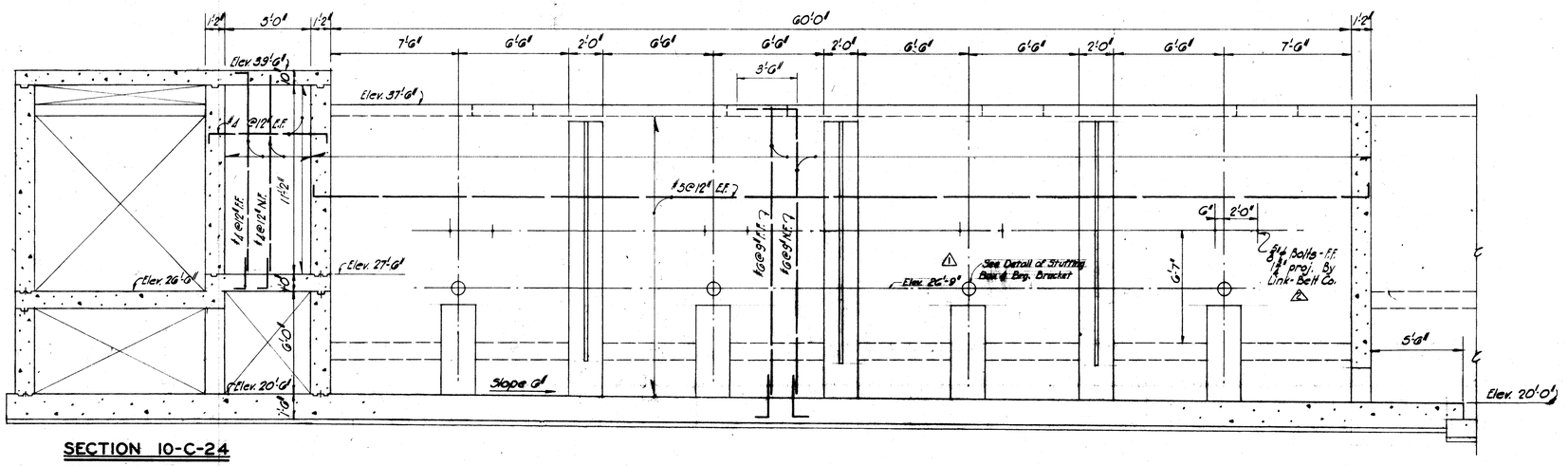
25-340 -100-



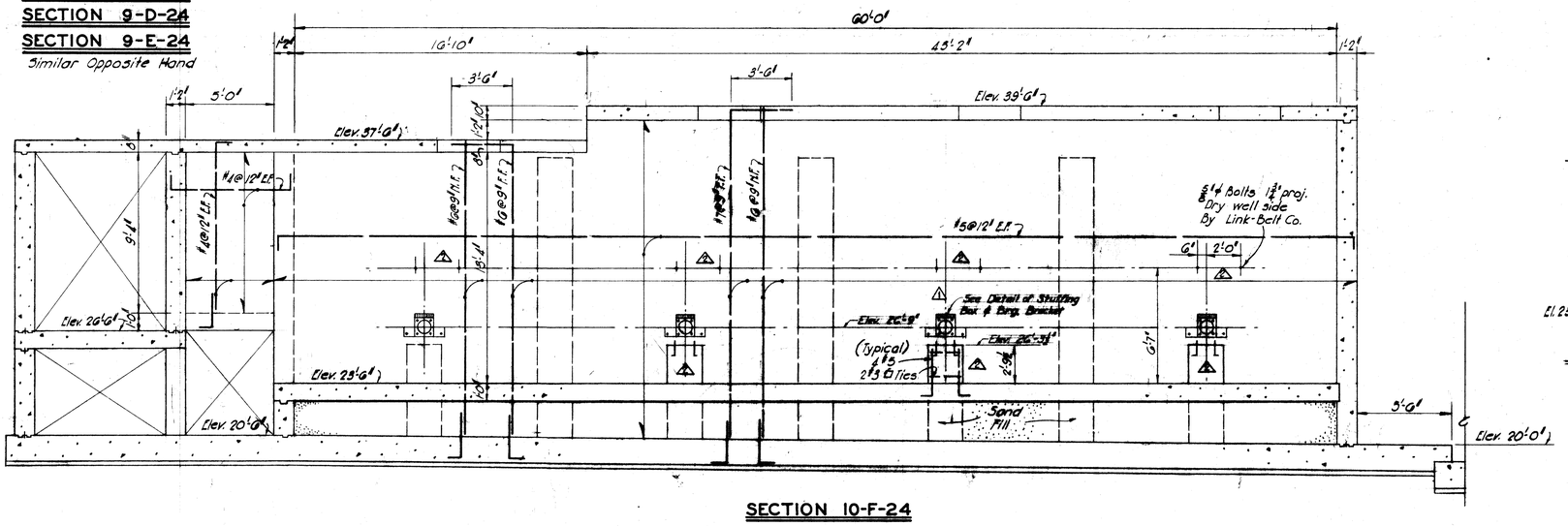
SECTION 10-A-24
SECTION 9-B-24
Similar Opposite Hand



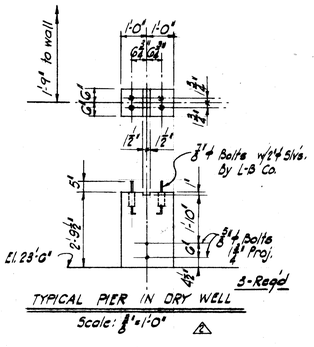
△ **STUFFING BOX & BEARING BRACKET DETAIL**
No Scale



SECTION 10-C-24
SECTION 9-D-24
SECTION 9-E-24
Similar Opposite Hand

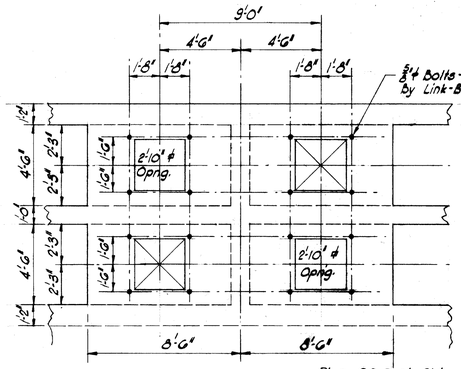


SECTION 10-F-24



TYPICAL PIER IN DRY WELL
Scale: ½"=1'-0" △

△ **PLAN - FLASH MIXERS**
Scale: ¼"=1'-0"



Plan Of East Side. West Side Similar Opp. Hand. See Dwg. 9 & 10 for Location

NO	DATE	BY	REVISION
			1-3-57 F.L. As Built.
△	8-5-55	H.B.S.	Added Stuffing Box Detail, anchor rods, & holes in walls for Floculator shafts, And Flash Mixer Details.
△	2-25-55	R.F.	Add Chain Guard Bolts & Mor Detail

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

GLENN E. HANDS NUMBER E-2317 REGISTERED PROFESSIONAL ENGINEER STATE OF MISSOURI

JOB NO. 55-340

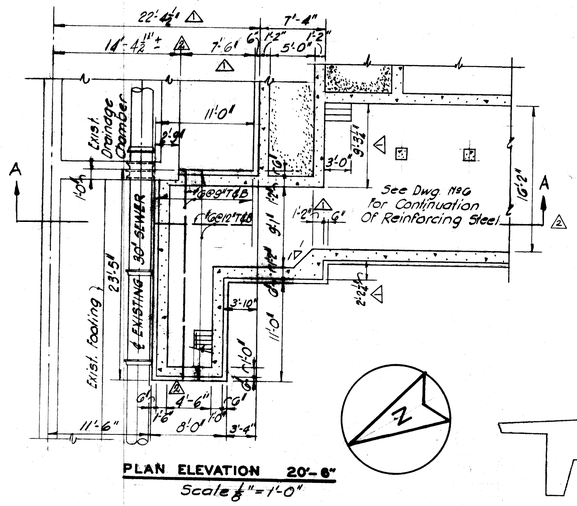
1955

SCALE: 1 inch = 1 ft.

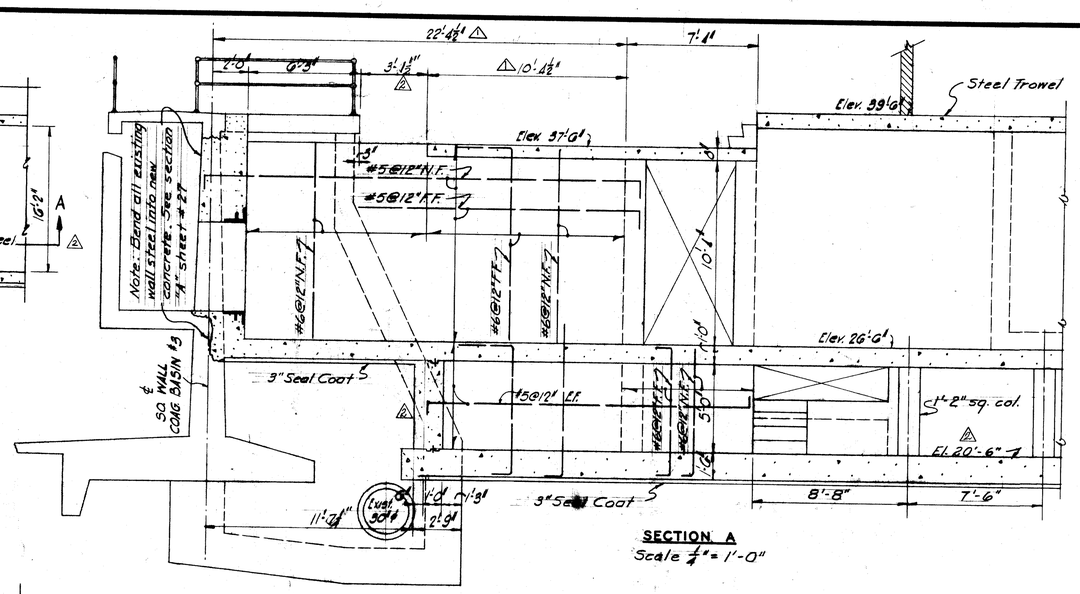
SHEET NO.

25-340 -101-

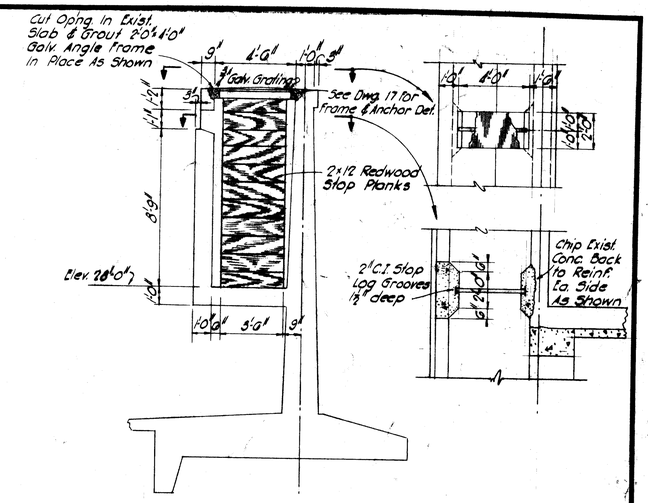
25-340 -101-



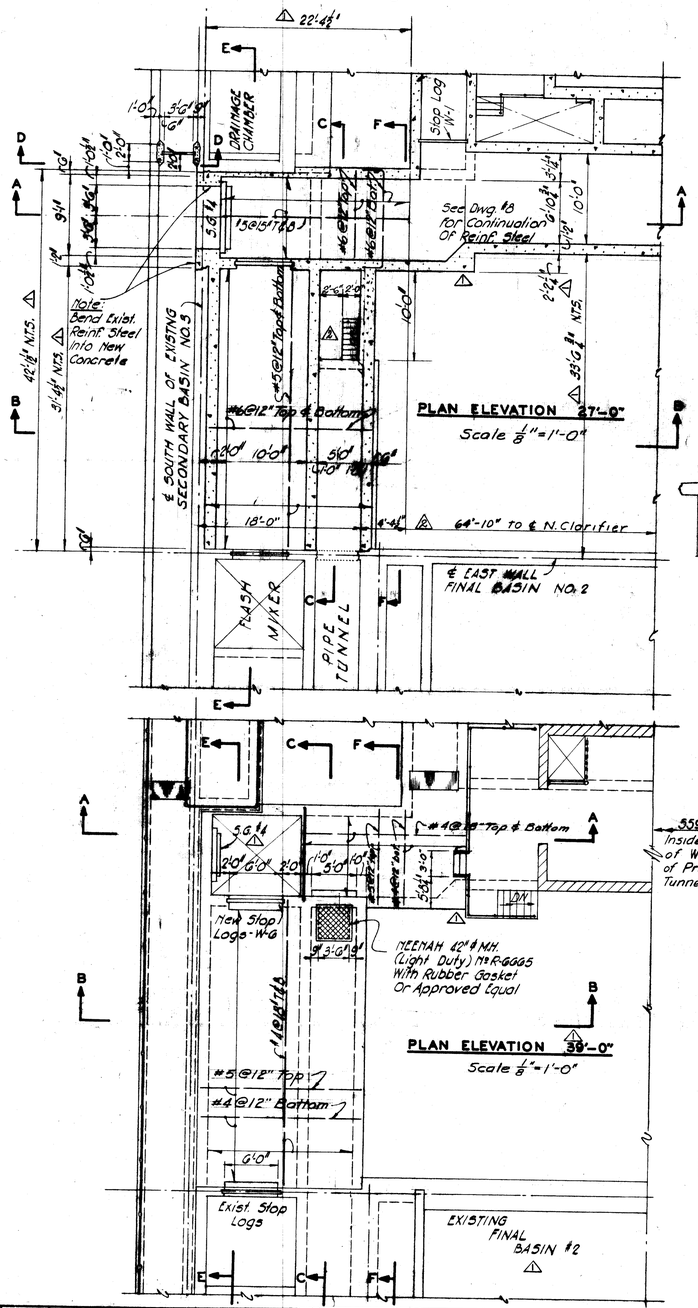
PLAN ELEVATION 20'-6"
Scale $\frac{1}{8}$"=1'-0"

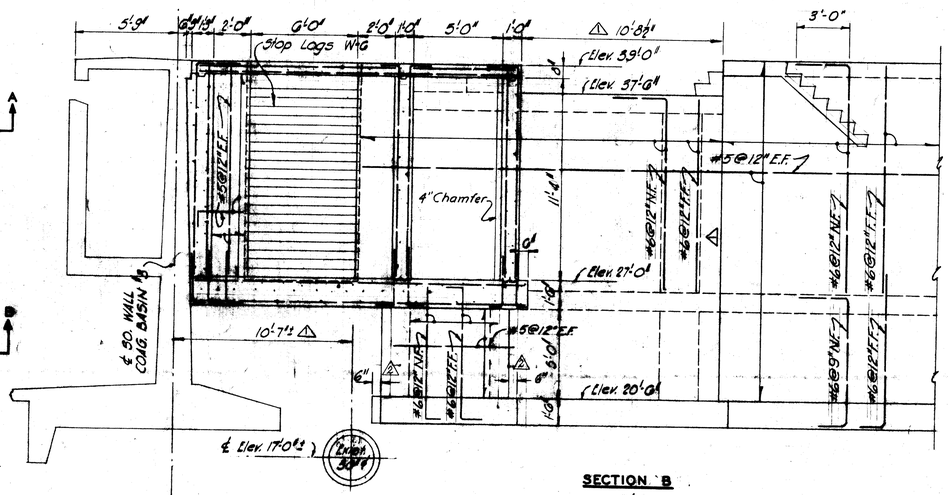


SECTION A
Scale $\frac{1}{4}$"=1'-0"

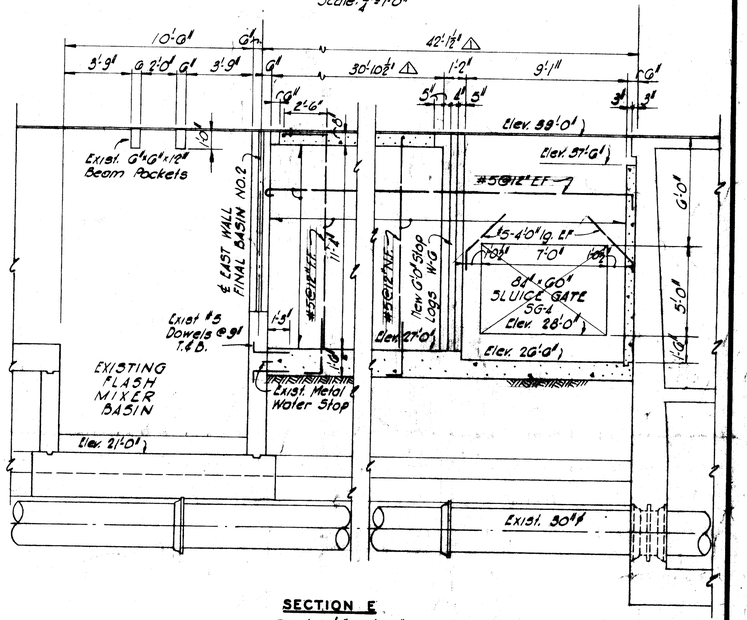


SECTION D
Scale: $\frac{1}{4}$"=1'-0"





SECTION B
Scale $\frac{1}{4}$"=1'-0"



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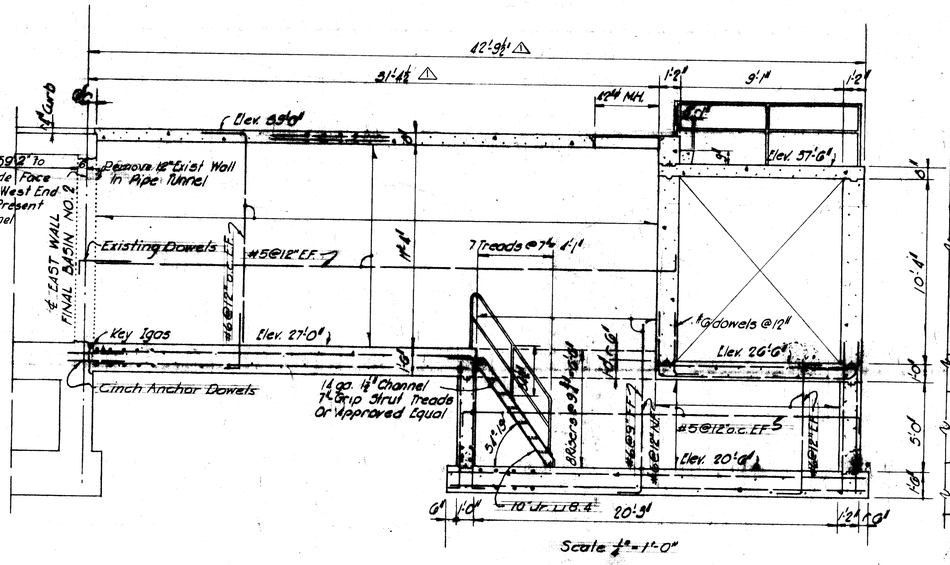
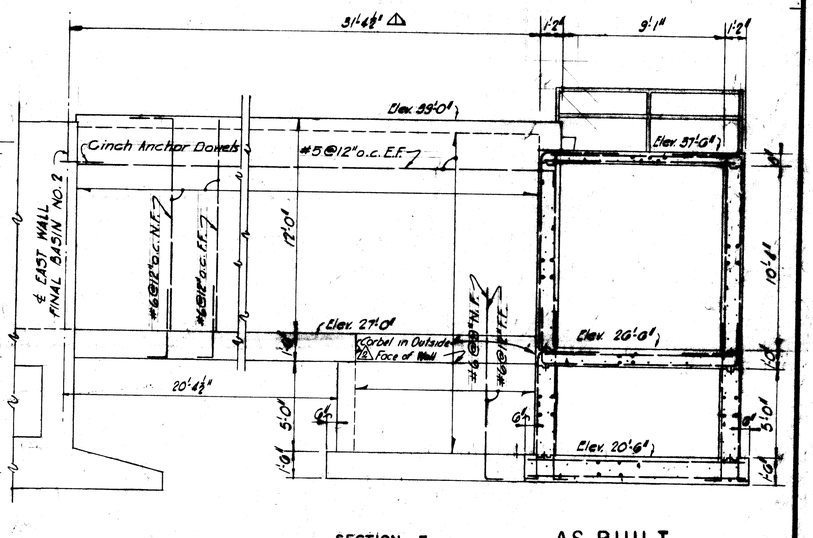
Scale $\frac{1}{4}$"=1'-0"



Scale $\frac{1}{4}$"=1'-0"

SECTION C

NORTH-WEST BASIN INLET



SECTION F
Scale $\frac{1}{4}$"=1'-0"

AS BUILT

NO.	DATE	BY	REVISION
1	6-25-55	R.F.	Shift Drainage Struct. 2'-2½" to West in Plan. Revise Sections to Agree
2	12-27-56	F.L.	As Built.

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

1955

GLENN E. HANDS NUMBER E-2317 REGISTERED PROFESSIONAL ENGINEER STATE OF MISSOURI

DESIGNED WHH | TRACED
DETAILED RRF-HEW | CHECKED WHH

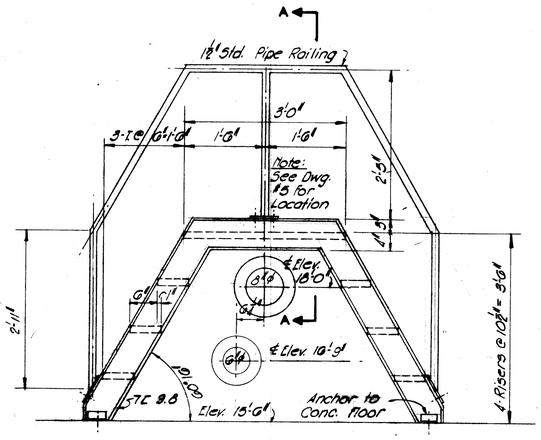
JOB NO. 52-34D

SCALE : AS SHOWN

SHEET NO. 25

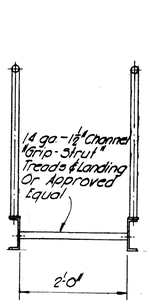
-101- GARAGE

25-340 -105-

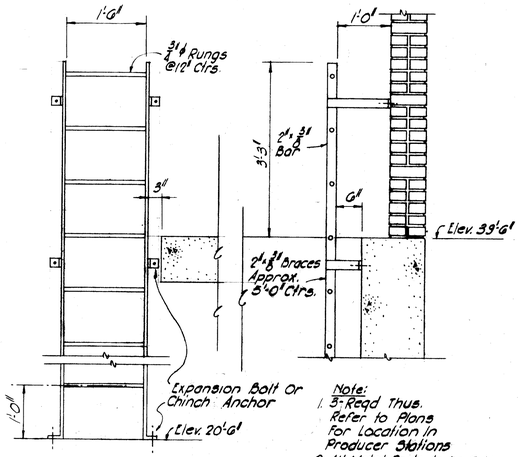


PIPE CROSSOVER DETAIL

Scale ¾"=1'-0"

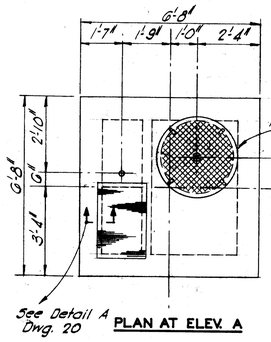


SECTION "A"

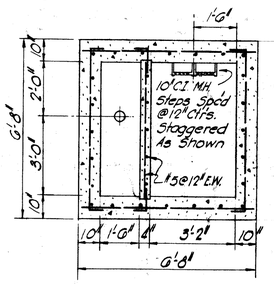


PRODUCER STATION LADDER DETAIL

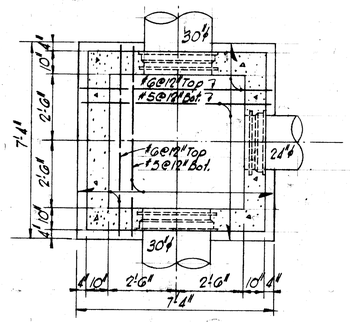
Scale ¾"=1'-0"



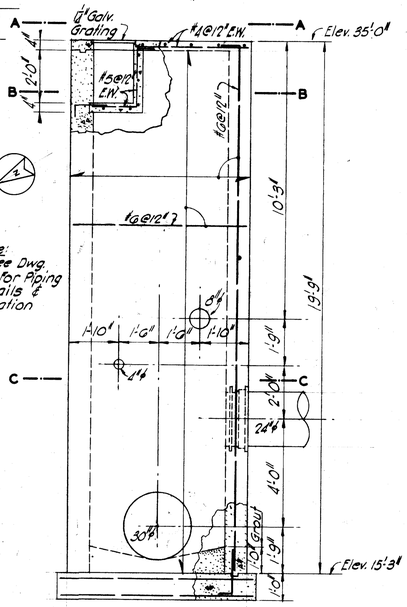
PLAN AT ELEV. A



PLAN AT ELEV. B



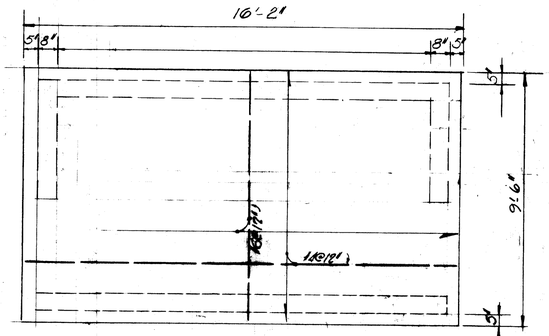
PLAN AT ELEV. C



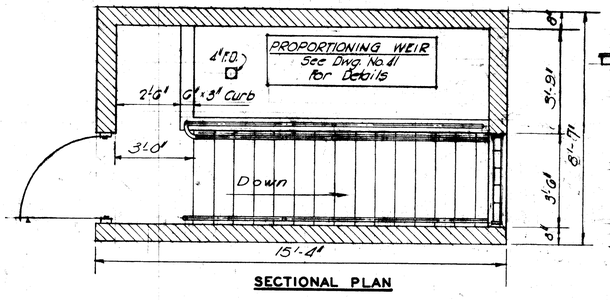
WEST ELEVATION

DROP MANHOLE DETAILS

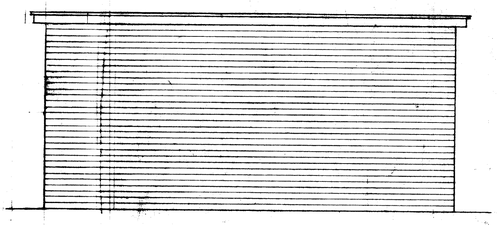
Scale: ⅜"=1'-0"



ROOF PLAN

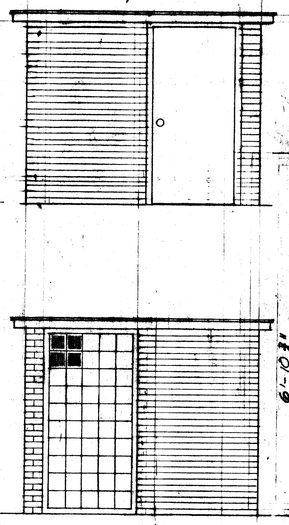


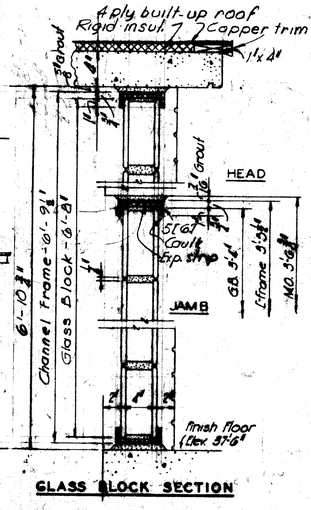
SECTIONAL PLAN



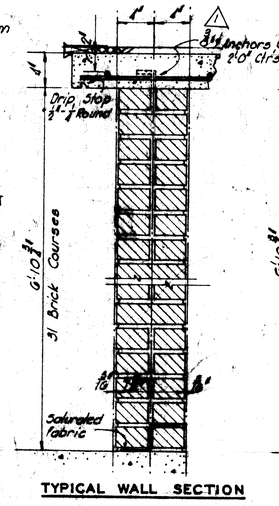
ELEVATIONS

Scale: ⅜"=1'-0"

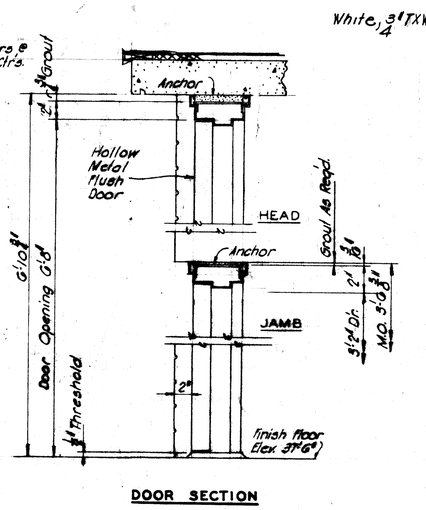




GLASS BLOCK SECTION



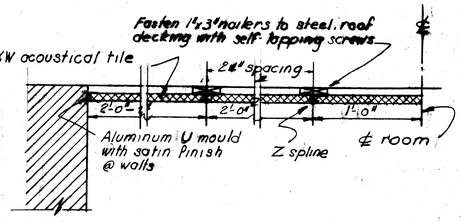
TYPICAL WALL SECTION



DOOR SECTION

TUNNEL STAIR HOUSE DETAILS

Scale: 1½"=1'-0"



ACOUSTICAL CEILING DETAIL FOR EXISTING CO_2 PRODUCER BUILDING

Scale: ½"=1'-0"

NO	DATE	BY	REVISION
1	8-5-55	R.E.	8" slab onchairs
	1-3-57	F.L.	As Built

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

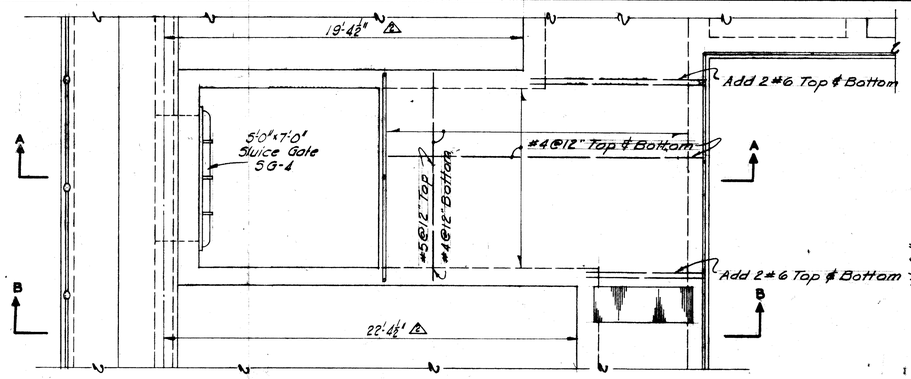
AS BUILT

REGISTERED STATE OF MISSOURI GLENN E. HANDS NUMBER E-2317 PROFESSIONAL ENGINEER

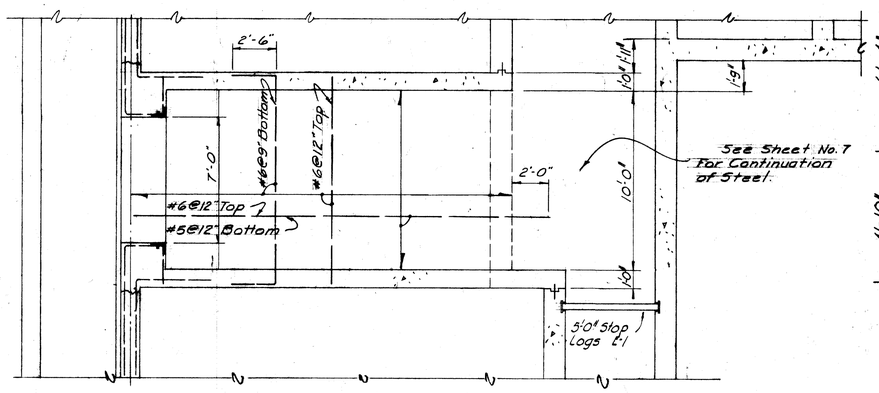
KANSAS CITY

1955

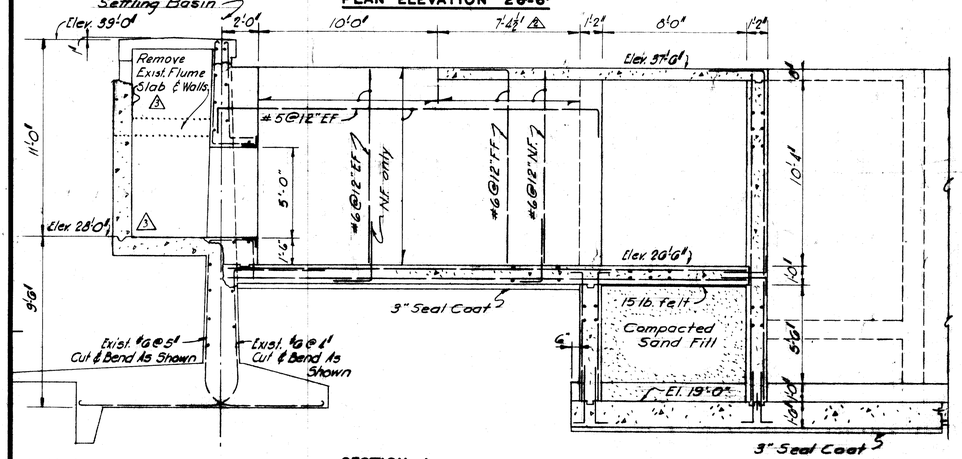
25-37D -103-



PLAN ELEVATION 37'-6"

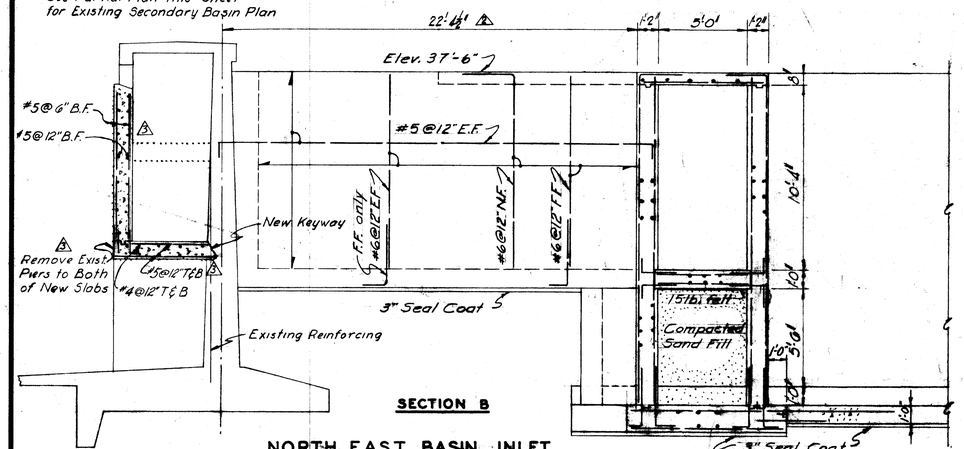


PLAN ELEVATION 26'-6"



SECTION A

Note:
See Partial Plan This Sheet for Existing Secondary Basin Plan



SECTION B

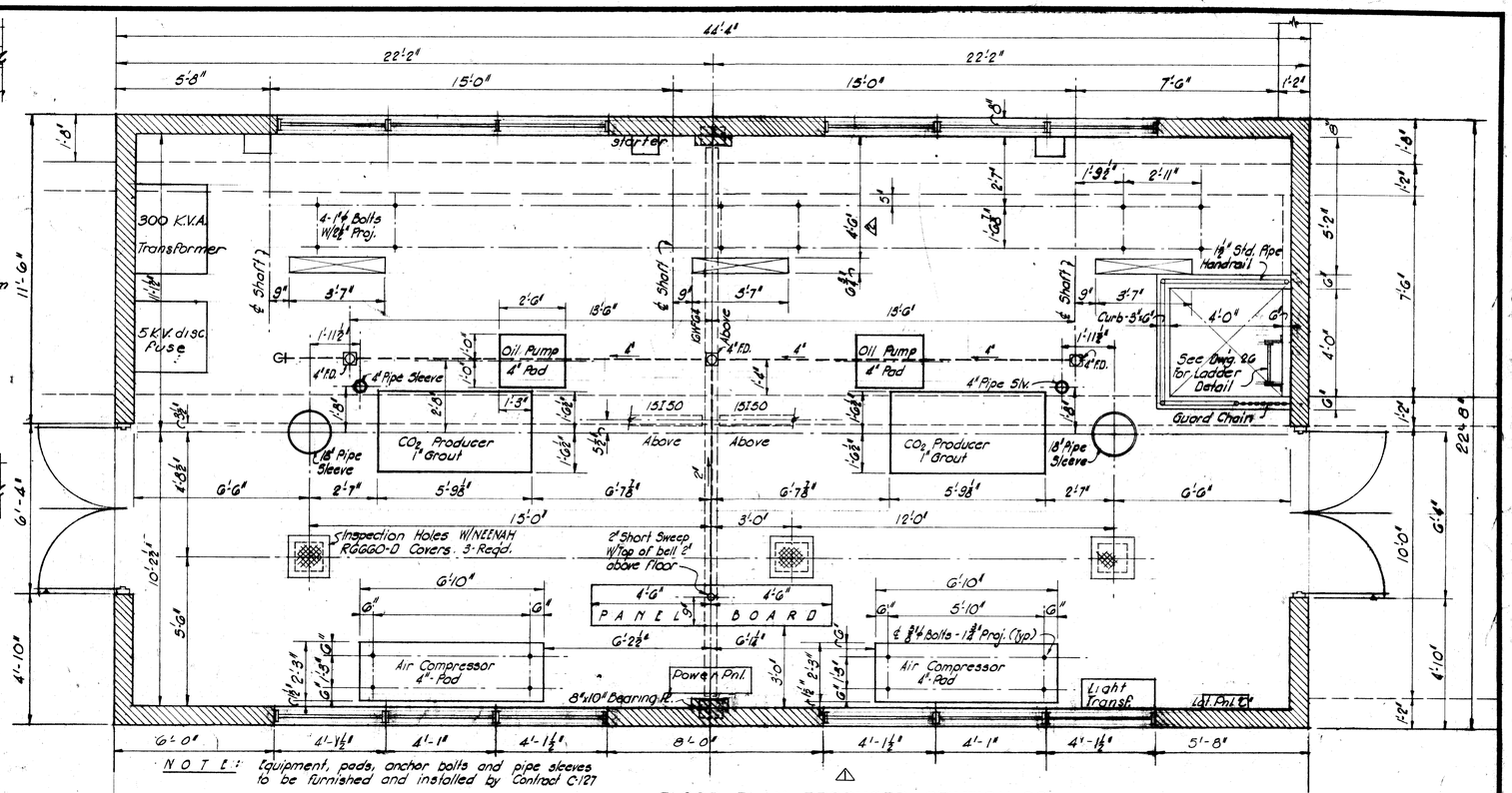
NORTH EAST BASIN INLET

Scale: 1"=10'

NO	DATE	BY	REVISION
1	8-5-58	R.R.T.	Relocate Equipment & Ladder well; Add pipe sleeves in Producer Sta. Rebeam & add pipe sleeves on Producer Sta. Roof Plan.
2	8-26-58	R.T.	Revise Chain Clamp Dim. In

Producer Station Plan, Revised N.E. Basin Inlet Dimensions.

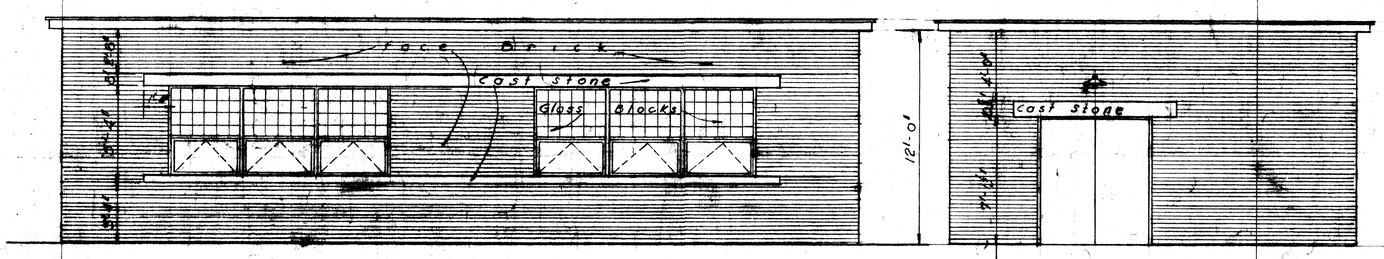
3 10-30-58 R.T. As Built.



NOTE: Equipment, pads, anchor bolts and pipe sleeves to be furnished and installed by Contract C-127

FLOOR PLAN PRODUCER STATION 3C

Scale: 3/8" = 1'-0"

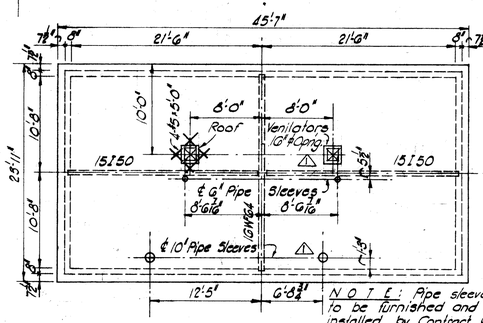


SIDE ELEVATION

Scale: 1/4" = 1'-0"

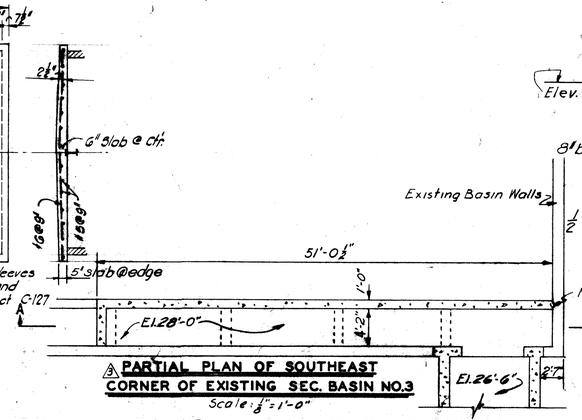
END ELEVATION

Scale: 1/4" = 1'-0"



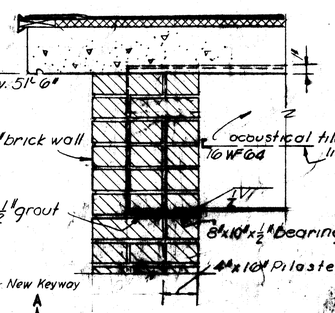
REINFORCING FOR ROOF SLAB

Scale: 1/8" = 1'-0"



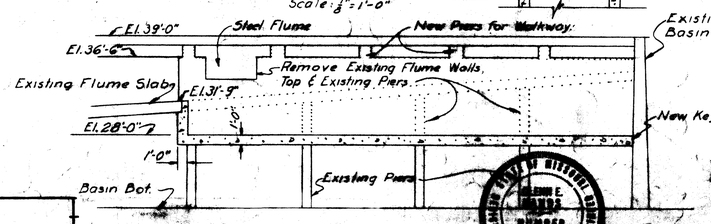
PARTIAL PLAN OF SOUTHEAST CORNER OF EXISTING SEC. BASIN NO. 3

Scale: 1/8" = 1'-0"



BEAM DETAIL

Scale: 1½" = 1'-0"



SECTION A-A

Scale: 1" = 1'-0"

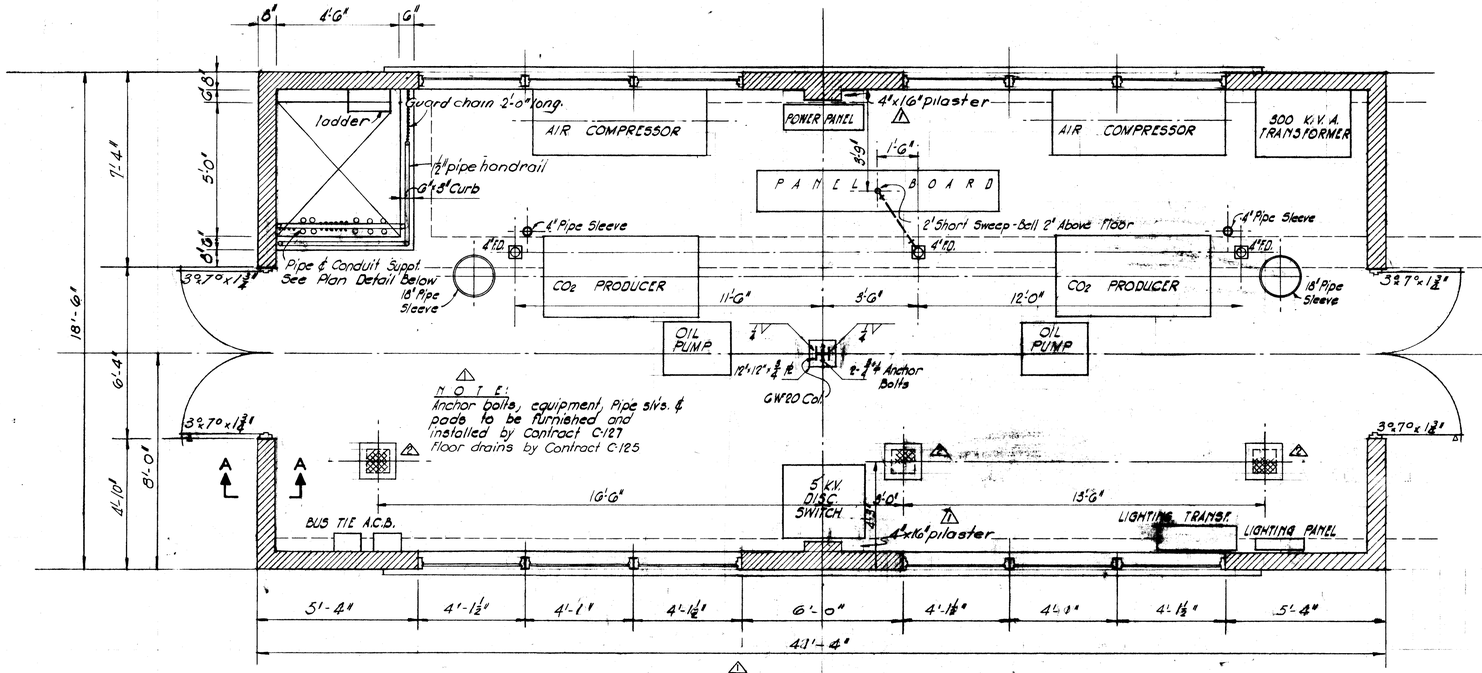
Note: See sheet # 10 For location & orientation.

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & [illegible] CO.
KANSAS CITY MISSOURI

25-34D-104

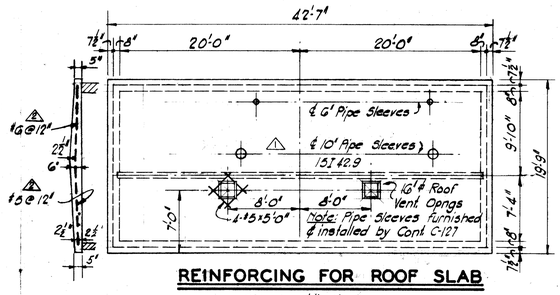


FLOOR PLAN 3A-&-3B OPP HAND

Scale: 3/8" = 1'-0"

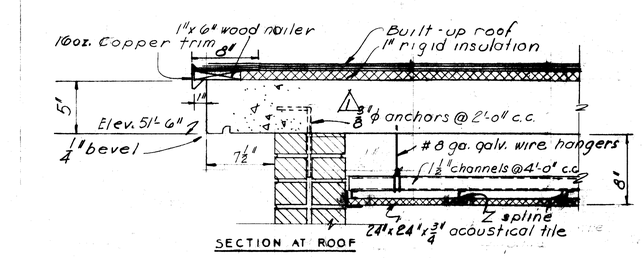
Above plan for 3A, 3B similar except opposite hand.

Note! for CO_2 Producer Building 3A-3B

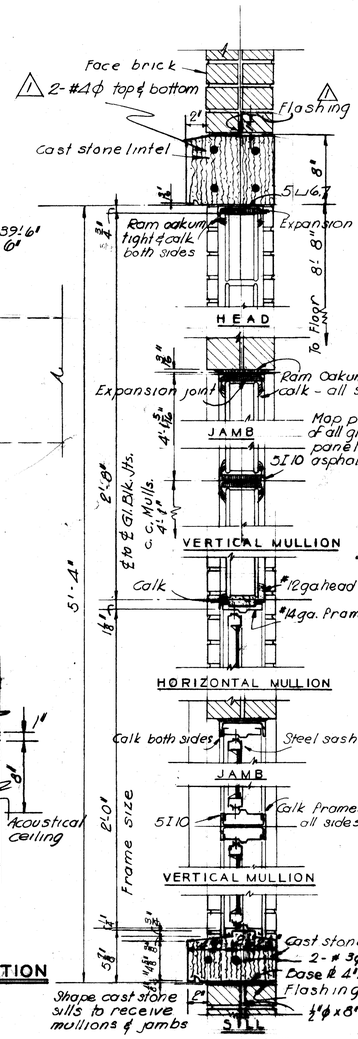


REINFORCING FOR ROOF SLAB

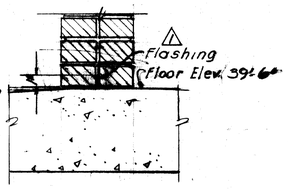
Scale: 1/8" = 1'-0"



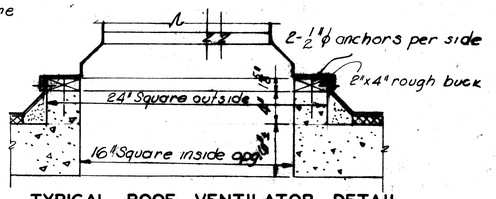
SECTION AT ROOF



TYPICAL DOOR DETAIL



SECTION A-A



TYPICAL ROOF VENTILATOR DETAIL

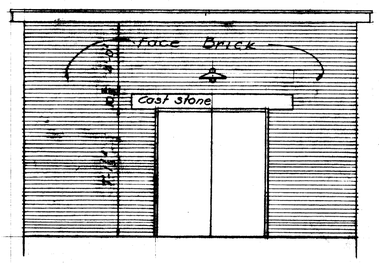
Scale: 1½" = 1'-0"

Note! Window, door, & roof ventilator details similar for Producer Buildings # 3A, 3B, & 3C.

To Building # 3A, see sheet # 10
Building # 3B, see sheet # 9
For location & orientation

PIPE & CONDUIT SUPPORT DETAIL

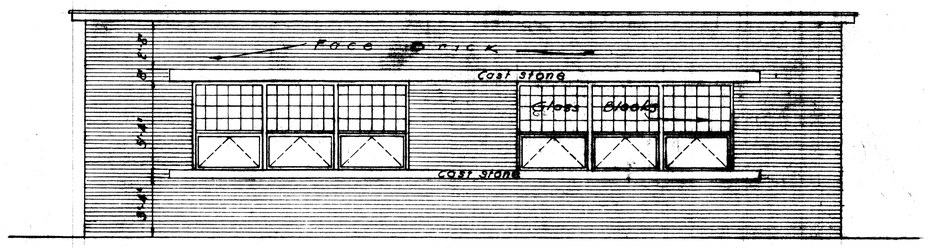
Scale: 1½" = 1'-0"



END ELEVATION

Scale: 1/4" = 1'-0"

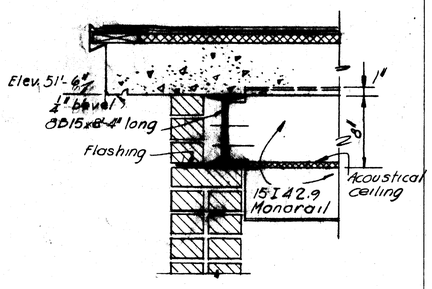
Note! End Elevation for Building # 3B similar.



SIDE ELEVATION

Scale: 1/4" = 1'-0"

CO_2 PRODUCER BLDGS. 3A-&-3B



TYPICAL MONDRAIL CONNECTION

Scale: 1½" = 1'-0"

NO	DATE	BY	REVISION
1	8-5-55	K.E.	Added brick pilasters, & changed Flashing, & slab anchors & noted cast stone reinforcing.
2			Relocate equipment, pipe sleeves & floor drains on roof & floor plans. Revise Pipe & Conduit Support Detail
3	8-25-55	R.F.	Added inspection openg. in producer station floor. Change reinf. steel in roof slab.
4	12-29-56	F.L.	As Built

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BOWER & BOUTWELL ENGINEERING CO.
KANSAS CITY MISSOURI

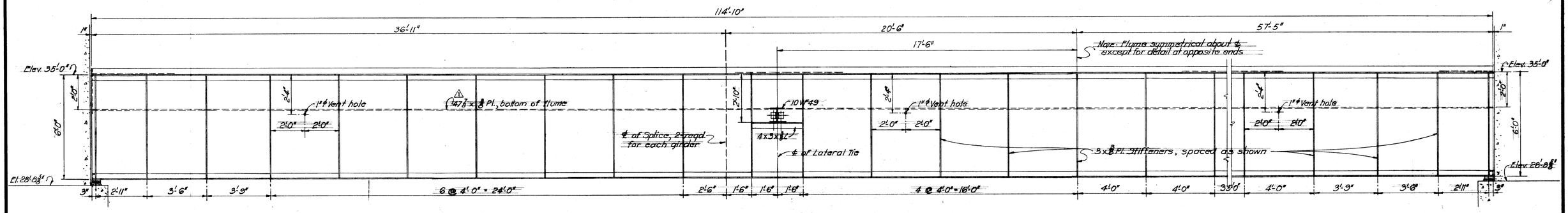
GLENN E. HANDS NUMBER E-2517 REGISTERED PROFESSIONAL ENGINEER STATE OF MISSOURI

DESIGNED KEE
DRAWN KEE
CHECKED
REVISED

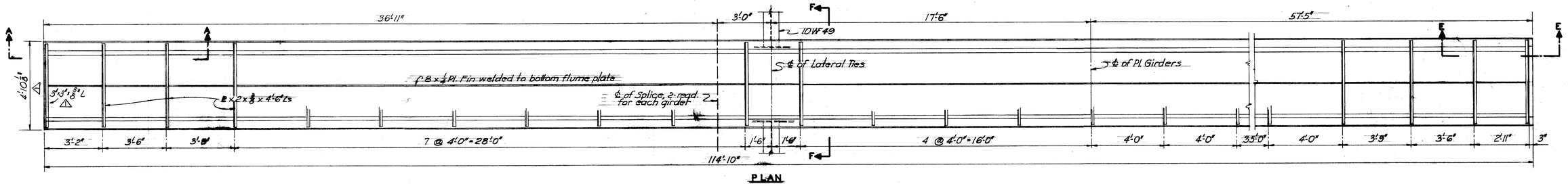
JOB NO. 53-34D

1955

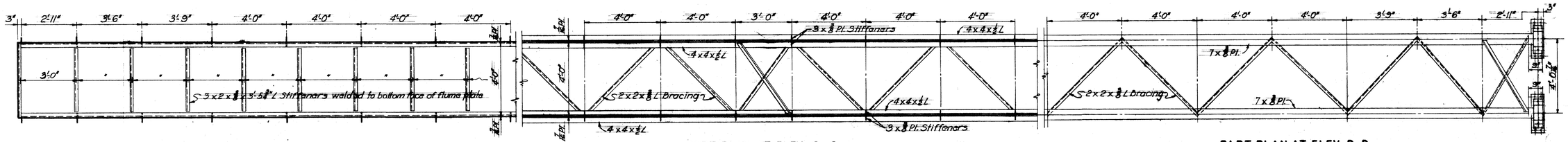
SHEET NO. 8



ELEVATION



PLAN



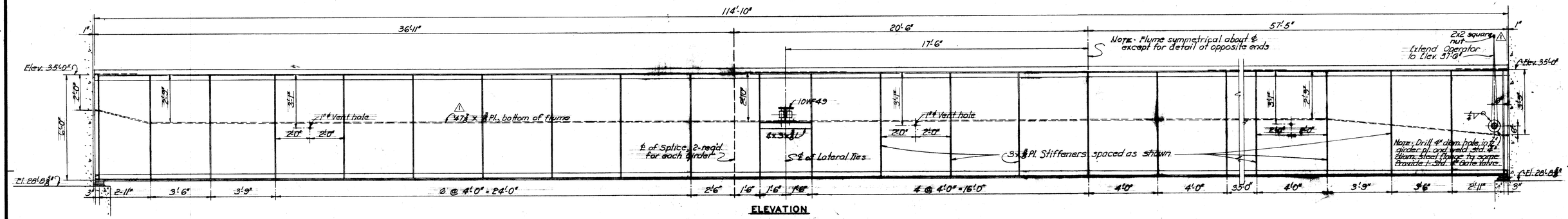
PART PLAN AT ELEV. A-A

PART PLAN AT ELEV. C-C

PART PLAN AT ELEV. D-D

DETAIL OF NORTH FLUMES (6 REQD. THUS)

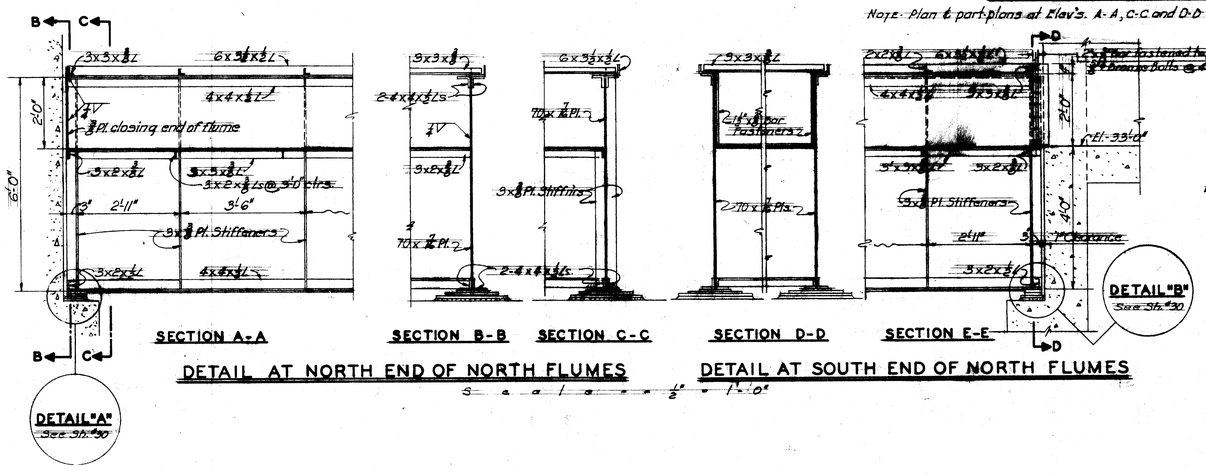
Scale - ⅜" = 1'-0"



ELEVATION

DETAIL OF SOUTH FLUMES (6 REQD. THUS)

Note: Plan & part plans at Elev's. A-A, C-C and D-D are the same as for North Flumes

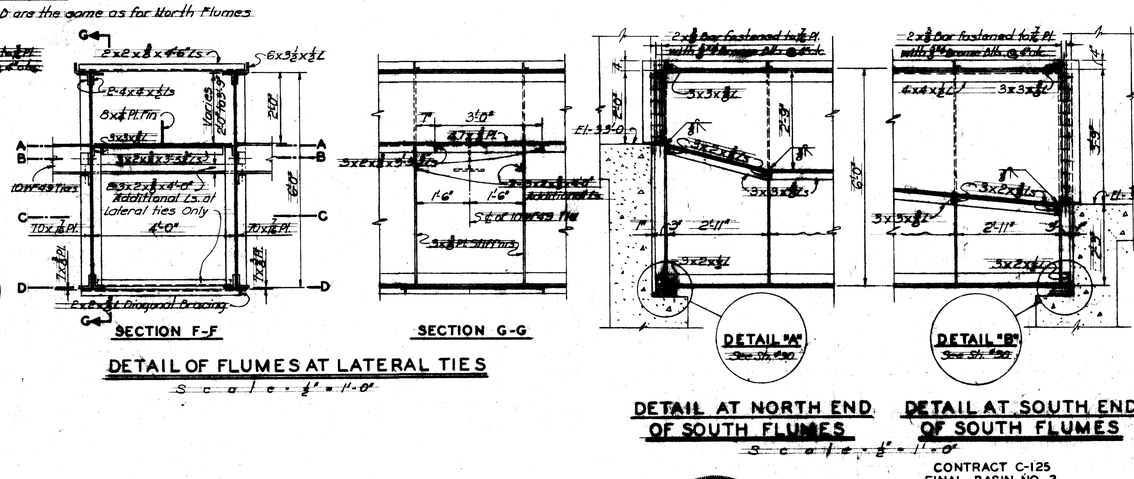


SECTION A-A | SECTION B-B | SECTION C-C | SECTION D-D | SECTION E-E

DETAIL AT NORTH END OF NORTH FLUMES

DETAIL AT SOUTH END OF NORTH FLUMES

Scale - ½" = 1'-0"



SECTION F-F | SECTION G-G

DETAIL OF FLUMES AT LATERAL TIES

Scale - ½" = 1'-0"

DETAIL AT NORTH END OF SOUTH FLUMES

DETAIL AT SOUTH END OF SOUTH FLUMES

Scale - ½" = 1'-0"

NO.	DATE	BY	REVISION
1	6-5-55	H.B.S.	Revised 47 to 47⅞ & changed wheel on operator to 2x2 square nut.
			Change Angle Size & Dimention In Plan
	1-3-57	F.L.	As Built.

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY, MISSOURI

GLENN E. HANDS — NUMBER E-2317 — REGISTERED PROFESSIONAL ENGINEER — STATE OF MISSOURI

AS BUILT

DESIGNED SSB | TRACED
DETAILED BAF | CHECKED

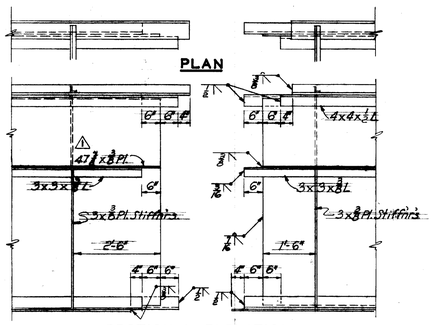
JOB NO. 25-34D

1955

SCALE

SHEET NO.

RS-34D -10C-

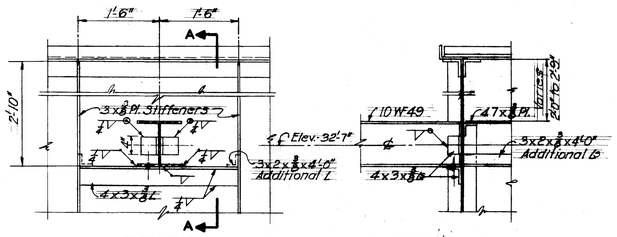


SECTIONAL ELEVATION

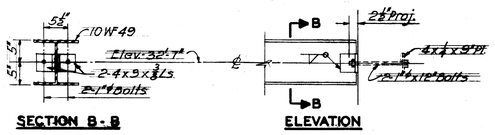
DETAIL OF TYPICAL SPLICE

Scale - ½" = 1'-0"

Note: Provide adequate Erection Plates & Bolts



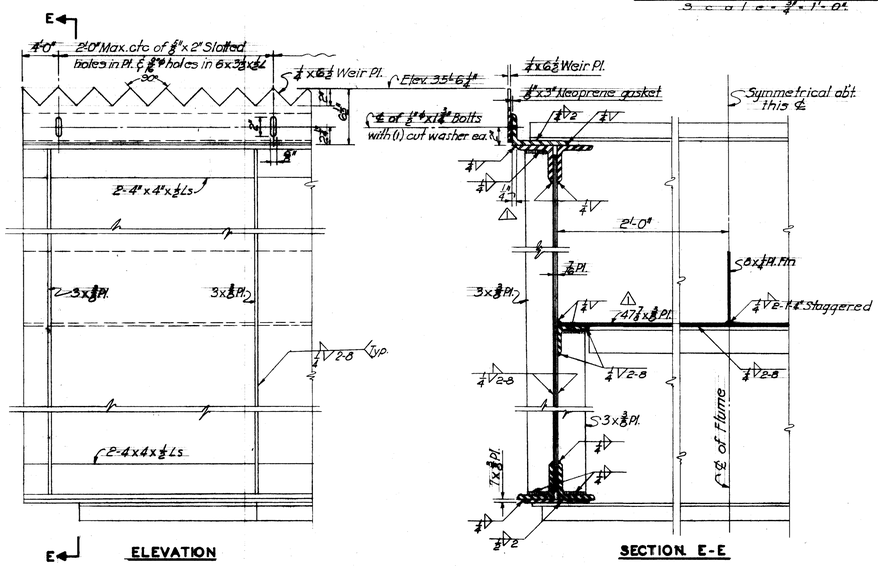
CONNECTION TO FLUMES



CONNECTION TO WALLS

DETAILS OF LATERAL TIES

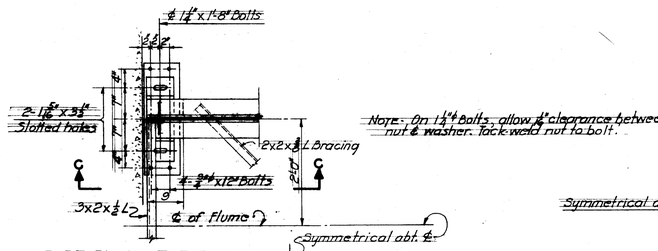
Scale - ¾" = 1'-0"



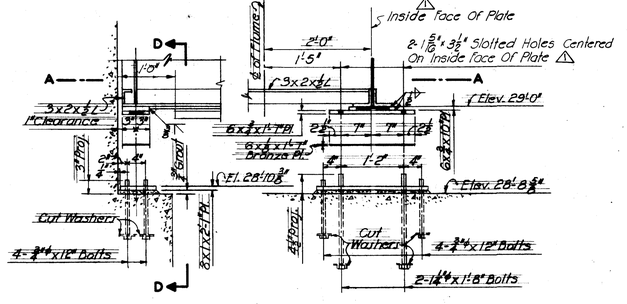
DETAIL OF WEIR PLATES AND TYPICAL FRAME WELDING

Scale - 1½" = 1'-0"

Note: Weir plates shall be shop fitted and match marked but shipped separate.



PART PLAN AT ELEV. A-A



SECTION C-C

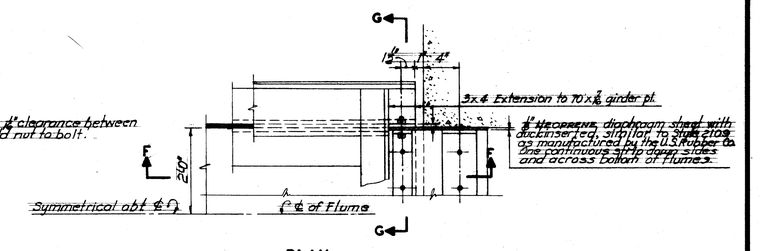
SECTION D-D

DETAIL "A"

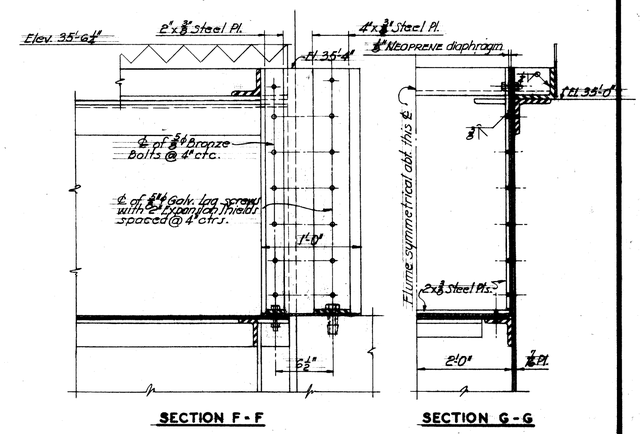
Scale - ¾" = 1'-0"

Note:- Detail "B" same as Detail "A" except holes in 6x⅜x1'-7" Pl. to be round instead of slotted; the ¾" Bronze Pl. to be omitted and equivalent thickness added to that of 6"x10" Pls. Nuts on balance of bolts to be tightened down and welded to the bolts.

To set weir plates for adjustment, fill basin to El. 34'-1½" and level plates. Make final correction while water is going over weir.



PLAN



SECTION F-F

SECTION G-G

DETAIL OF FLUME SEAL AT CONCRETE WALLS

Scale - 1½" = 1'-0"

NO.	DATE	BY	REVISION
1	8-5-55	H.B.S.	Revised 47 to 47⅜. Add Dimention - Detail 'A' & Section E-E
	1-3-57	F.L.	As Built.

AS BUILT

GLENN E. HANDS — NUMBER E-2317 — REGISTERED PROFESSIONAL ENGINEER — STATE OF MISSOURI

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

1956

DESIGNED	C&B	TRACED	
DETAILED	DAF	CHECKED	WHH-JMB

JOB NO. 52-34D

SCALE 1" AS SHOWN

SHEET NO. 39

Mis

25-340 -101-

N

NORTH BASE LINE

SOUTH 0+00

WEST 0+00

GRAVEL ROAD

SECONDARY SETTLING BASINS

FINAL SETTLING BASINS

FINAL BASIN NO.3

FILTER BUILDING

CHLORINE BUILDING

PUMPING STATION

HEADER CHAMBER

METER VAULT

7 MILLION GALLON CLEARWELL

SUBSTATION

APPROX. EAST PROPERTY LINE

8" GAS LINE

8" Gas Main ℄ El. 17'-3" Where It Crosses 36" Line 24

427'-1"

561'-0"

±20' Grade

Pitch Line

Top of 36" & 24 Water Line El. 16'-6"

Grade in This Area ± 19'-6"

±17' El.

8" Bottom all. ℄ El. 16'-11"

10'-0"

℄ El. 21'-8"

℄ El. 19'-8"

℄ El. 18'-6"

℄ El. 16'-11"

EAST BASE LINE

SOUTH BASE LINE

SOUTH 10+80

WEST 8+00

36"

24"

PLAN

GENERAL LAYOUT GAS SERVICE

This Contract — To here by Gas Service Co.

6'-10½"

3'-1½"

Perimmer Fence

Tag

℄ Meter & Pod

Meter Conn. Fig.

Dresser Coupling

C.I. Cover

18 W.C.P.

Plug Valve

Crush Rock

Grade ±19'-0"

Low Point

6" Pipe

SECTION AT GAS METER

Scale : None

GRAVELLED ROAD TO WATER WORKS

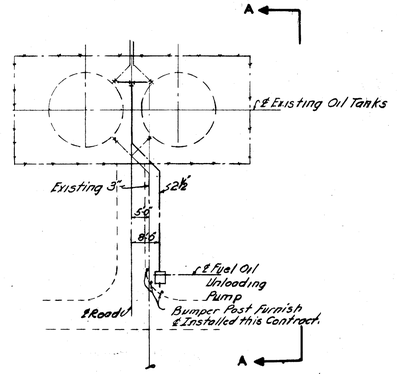
U.S. HWY. 169

K.C. MO.

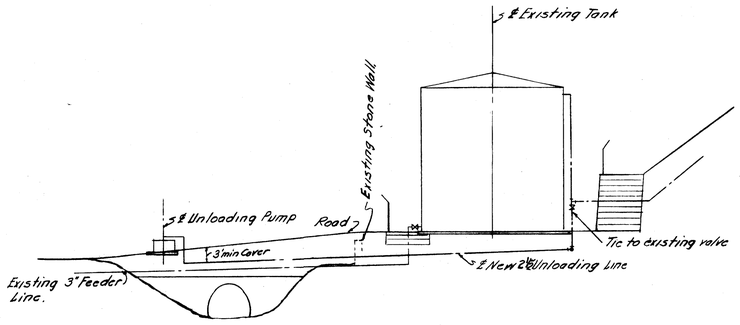
NO	DATE	BY	REVISION
1	12-28-56	F.L.	As Built.

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
[illegible] CITY, MO.

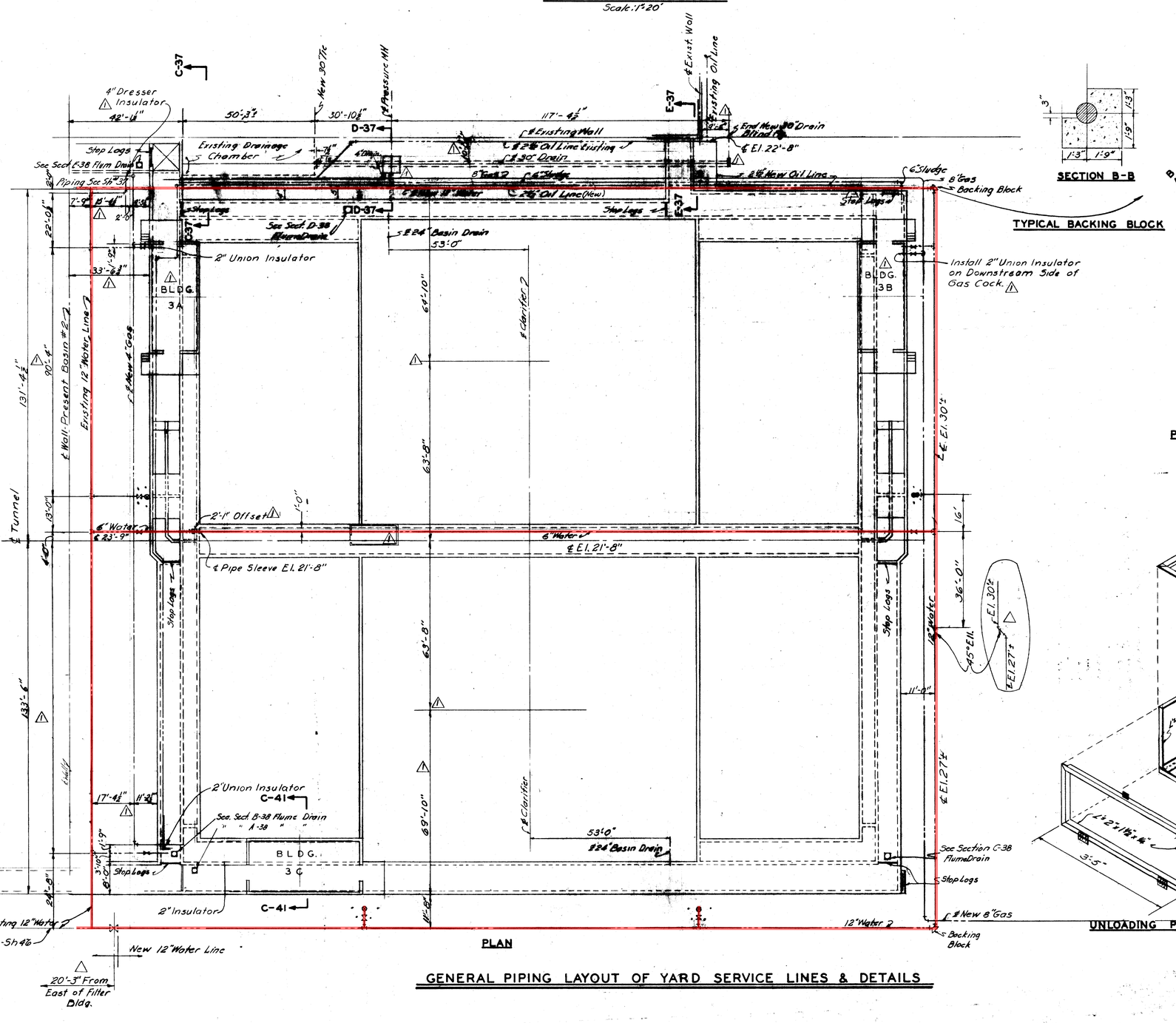
25-340 -108-



OIL PUMP & LOADING PLAN
Scale: 1"=20'

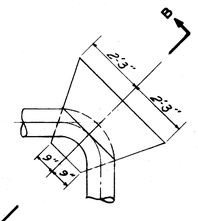


SECTION A-A

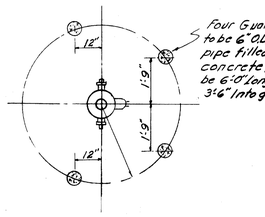


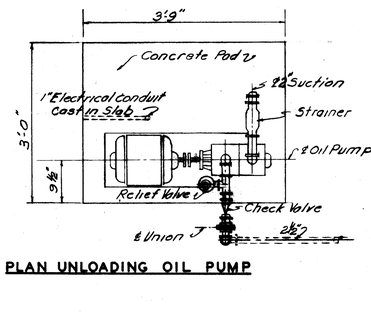
PLAN

SECTION B-B

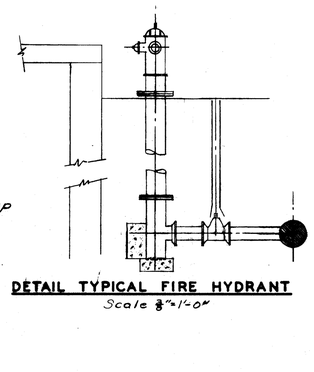


TYPICAL BACKING BLOCK

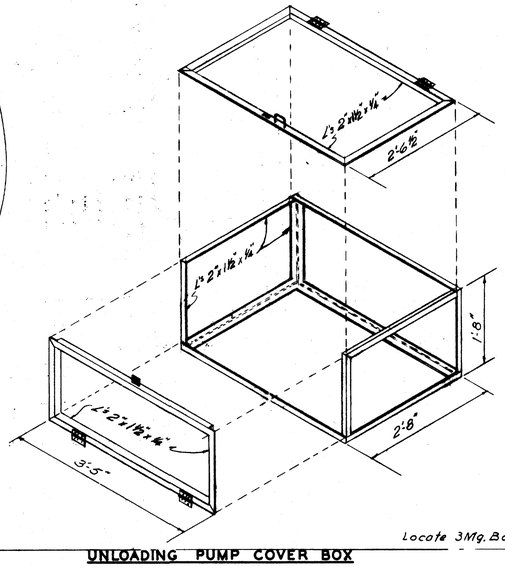




PLAN UNLOADING OIL PUMP



DETAIL TYPICAL FIRE HYDRANT
Scale ⅜"=1'-0"



UNLOADING PUMP COVER BOX

Notes:
1. Frame to be welded construction and completely covered with 16 ga. galv. sheet metal.
2. Provide opening in rear panel for 2½" discharge line from pump.
3. Provide heavy duty hinges, handle on to panel and facilities for locking as shown.
4. Entire assembly to be anchored to concrete pad in such a manner that it can be removed in the future.
5. After installation, paint with one coat of galv. metal primer and two coats of Aluminum ready-to-mix paint. Paint and primer to be Dupont or equal.

Locate 3 Mg. Bogs.

GENERAL PIPING LAYOUT OF YARD SERVICE LINES & DETAILS

NO.	DATE	BY	REVISION
1	12-31-56	F.L.	As Built.

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

GLENN E. HANDS — NUMBER E-2317 — REGISTERED PROFESSIONAL ENGINEER — STATE OF MISSOURI

AS BUILT

DESIGNED	CHB	TRACED	EAM
DETAILED	CHB	CHECKED	AZ

JOB NO. 52-340
1955
SCALE: 1"=20'-0"
SHEET NO. C-2

MICRO

K.C. No. 52-340

25-34D -10J-

N

B

B

Note: For Detail this Area See Sheet #35

Sludge C.I. Pumps

4" D.S. to Sump

E Basin

6" Sludge Suction Lines

Sump Pit

6" Sludge Suction Lines

E Basin

Sludge C.I. Pumps

4" F.S.

21'-0"

6" Sludge Discharged Lines

4" F.D.

2" Water to Weir

6" Sludge Discharged Lines

21'-0"

4" F.D.

16'-0"

4" F.D.

7"

26'-0"

±12"

4" F.D.

2'-0"

See Sheet 37 for Pipe in this Area.

℄ Elev 23'-8"

8" Water Line

Elev 22'-6"

℄ Elev 21'-8"

12"

1'-3½"

1'-3½"

℄ Elev 16'-9"

Elev 15'-6" Floor Drain

℄ 6" Sludge Lines

SECTION A-A

Scale: 3/8"=1'-0"

℄ El. 21'-8" Water Line 6"

12"

9"

℄ 8" Sump Drain

1'-3½"

℄ 6" Sludge Line

2'-6"

El. 15'-6"

1'-3½"

4" F.D.

SECTION B-B

Scale: 3/8"=1'-0"

1'-3"

4" F.D.

21'-4"

15½"

15½"

℄ 6" Sludge Line, El 22'-3"

9"

See Sheet 32

Note: See Sheet 36 for piping this Area.

PARTIAL PLAN SLUDGE LINES AND DRAINS

Scale: 1/8"=1'-0"

1	12-31-56	F.L. As Built.

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

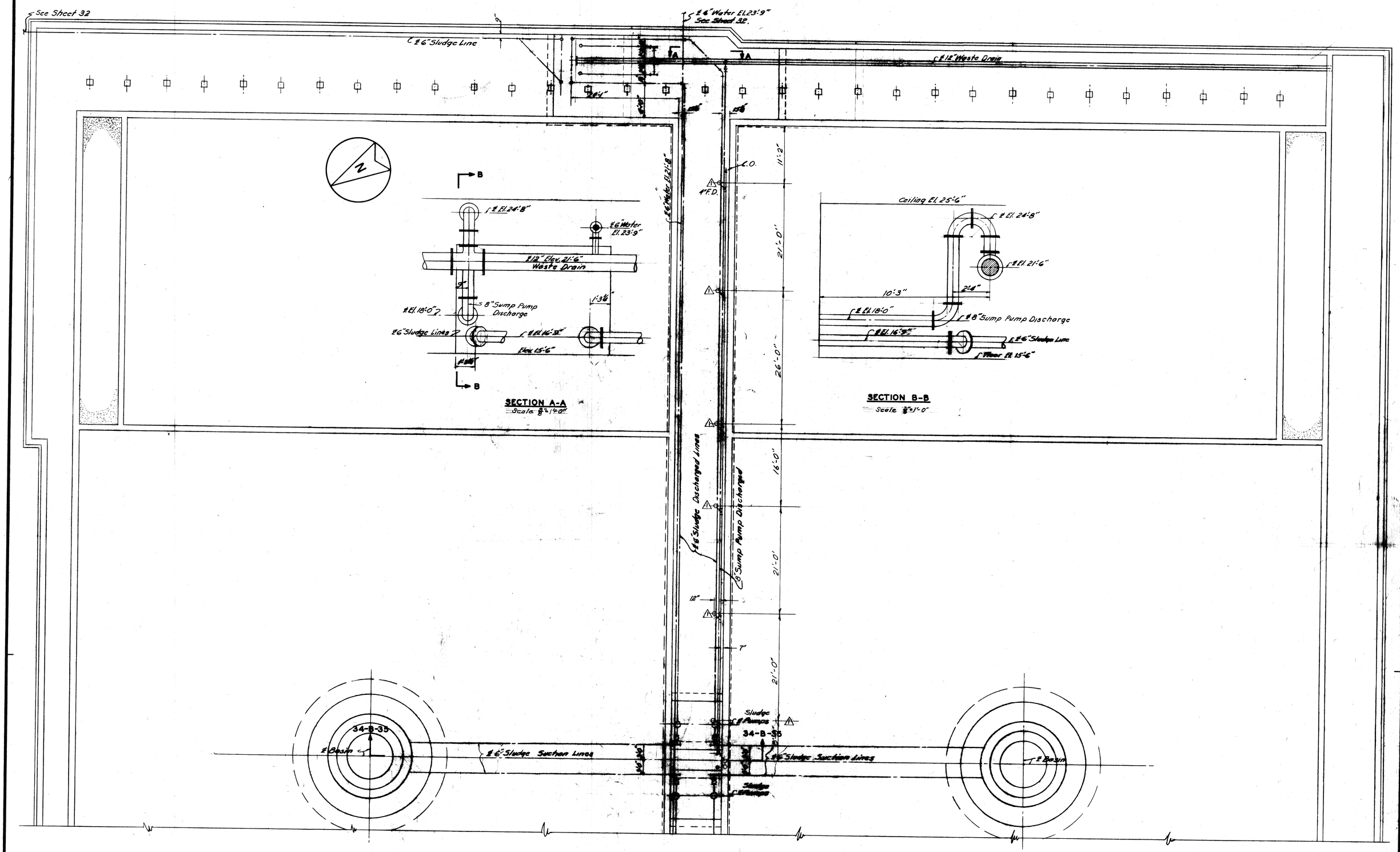
REGISTERED STATE OF MISSOURI
GLENN E. HANDS
NUMBER E-2317
REGISTERED PROFESSIONAL ENGINEER

DESIGNED GEH & CHECKED
DRAWN CHE & CHECKED

JOB NO. 52-34D

SCALE: 1/8 INCH

25-34D -110-



SECTION A-A
Scale ½"=1'-0"

SECTION B-B
Scale ½"=1'-0"

PARTIAL PLAN SLUDGE LINES AND DRAINS
Scale ½"=1'-0"

NO.	DATE	BY	REVISION
1	12-31-56	F.L	As Built.

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY MO.

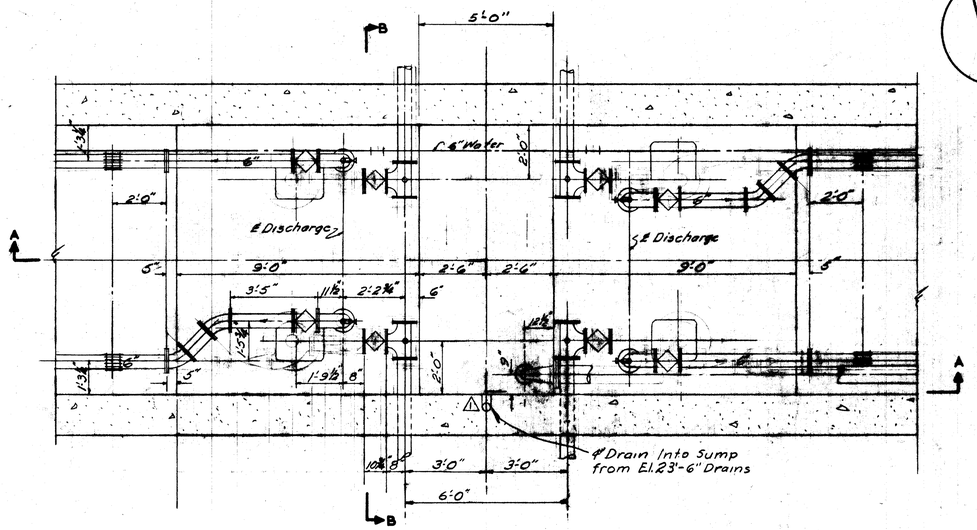
BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

GLENN E. HANDS — NUMBER E-2317 — REGISTERED PROFESSIONAL ENGINEER — STATE OF MISSOURI

DESIGNED GEH & CHB | TRACED
DETAILED CHB & GEH | CHECKED

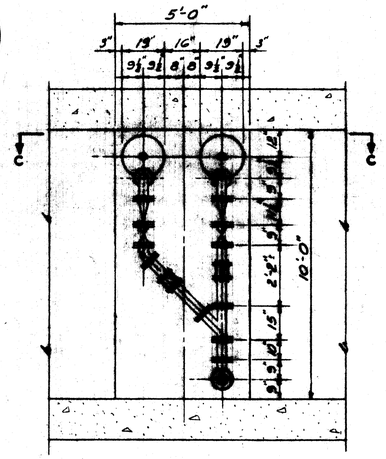
JOB NO. 52-34D

25-34D -111-



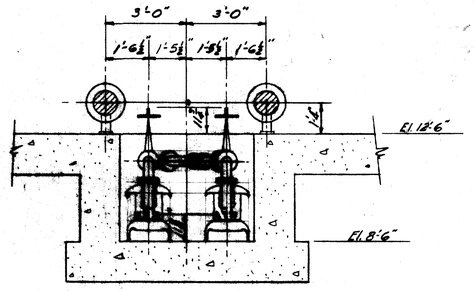
PLAN

SLUDGE PUMPS & SUMP



PLAN BELOW ELEVATION 15'-6"

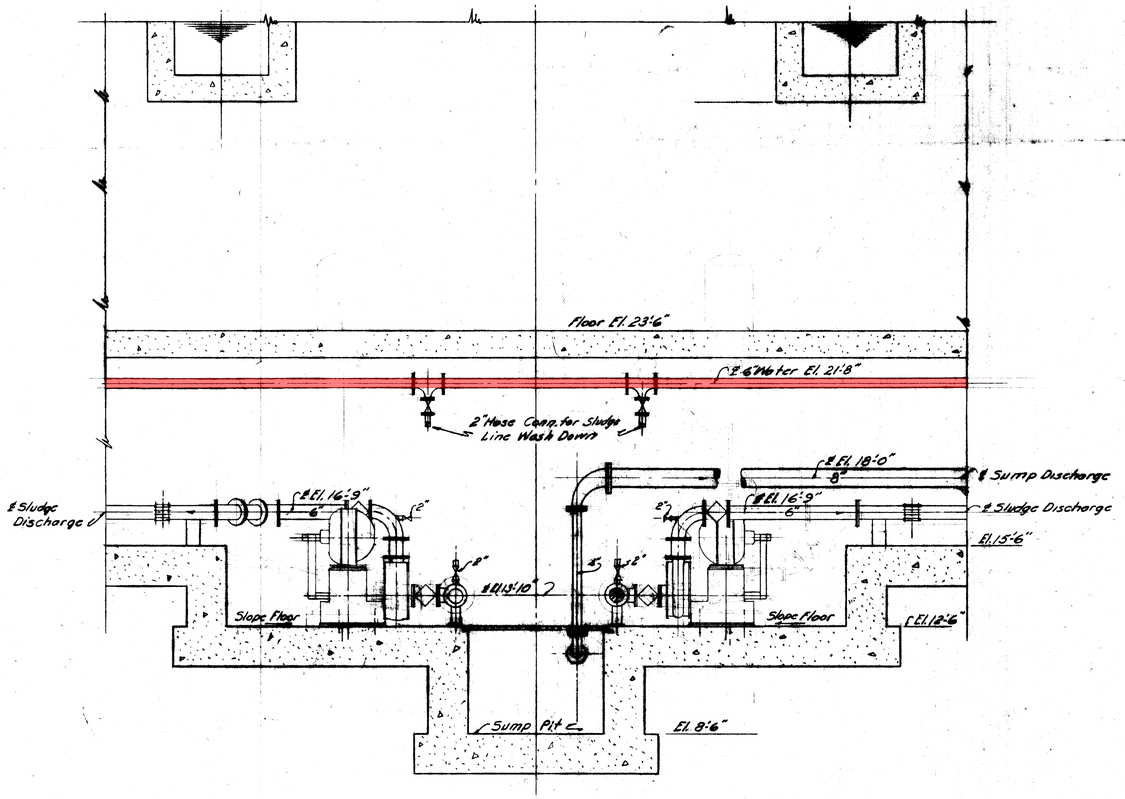
SUMP PUMPS & PIT



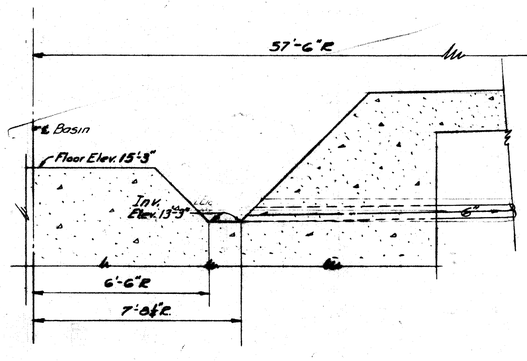
SECTION C-C

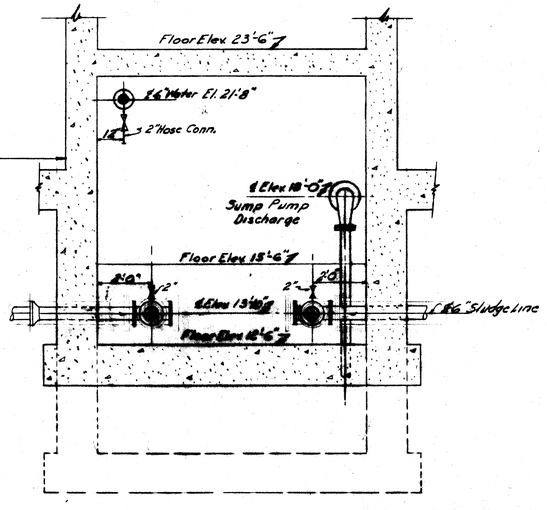
LEGEND

- PLUG VALVE
- GATE "
- CHECK "
- DRESSER COUPLING
- FLOOR DRAIN
- CLEANOUT



SECTION A-A





SECTION B-B

NO.	DATE	BY	REVISION
1	12-31-56	F.L.	As Built.

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

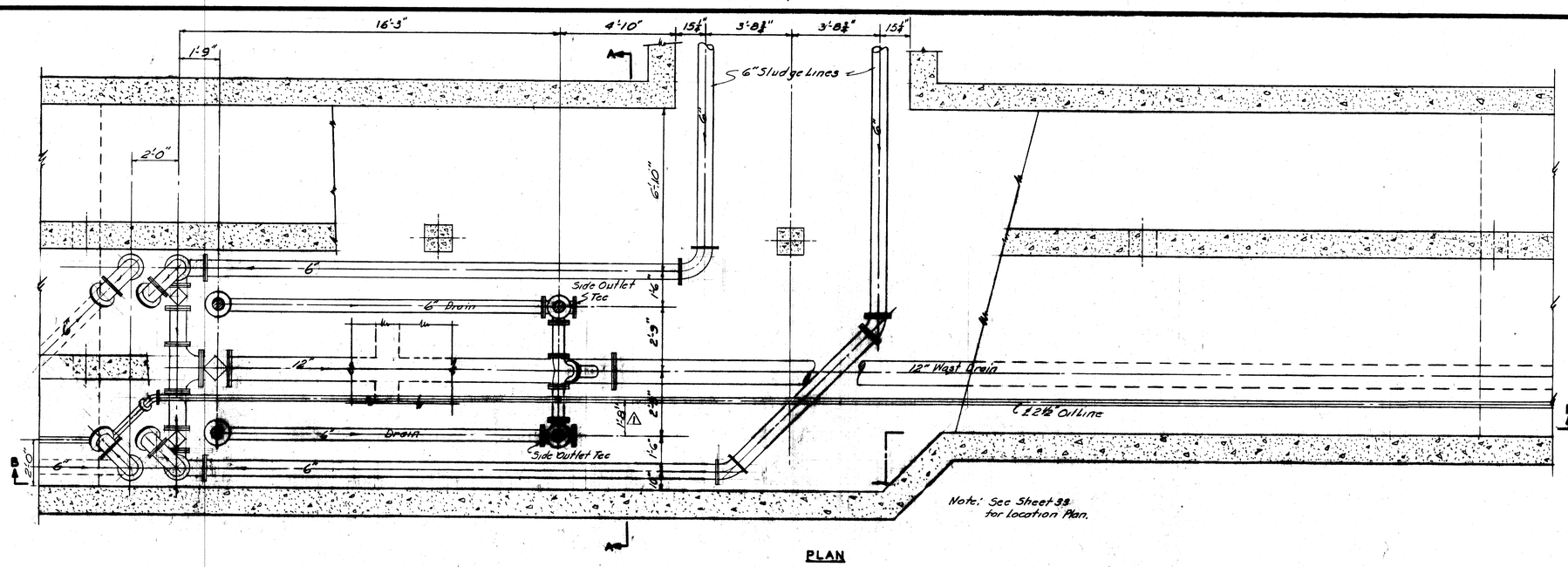
1955

AS BUILT

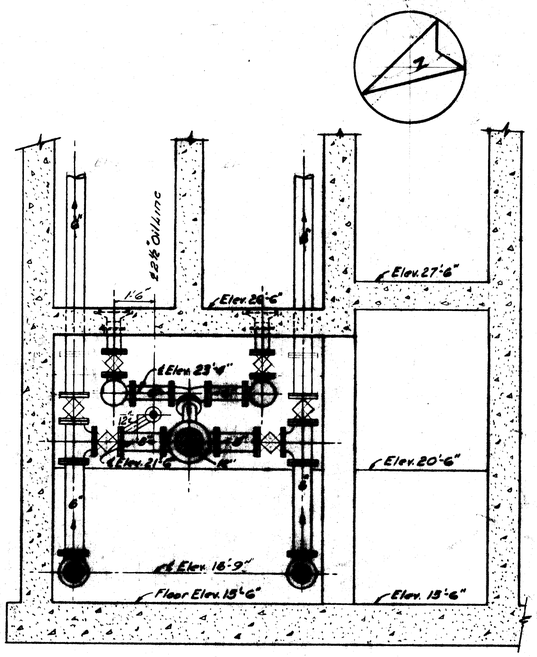
AS-34D

SCALE 1" = 1'-0"

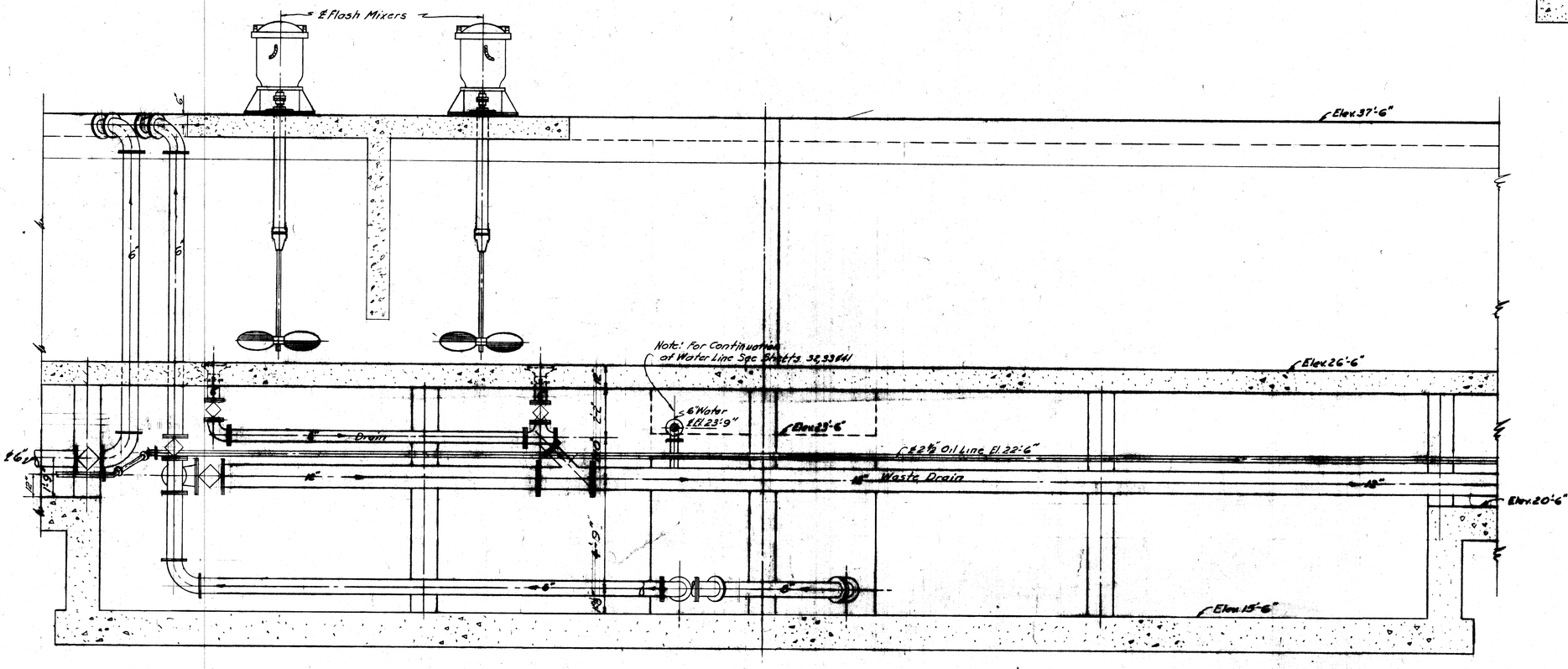
25-34D -115-



PLAN



SECTION A-A



SECTION B-B

SLUDGE LINES & DRAINS AT FLASH MIXERS

NO.	DATE	BY	REVISION
1	2-2-57	F.L	As Built

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

GLENN E. HANDS NUMBER E-2317 REGISTERED PROFESSIONAL ENGINEER STATE OF MISSOURI

AS BUILT

1955

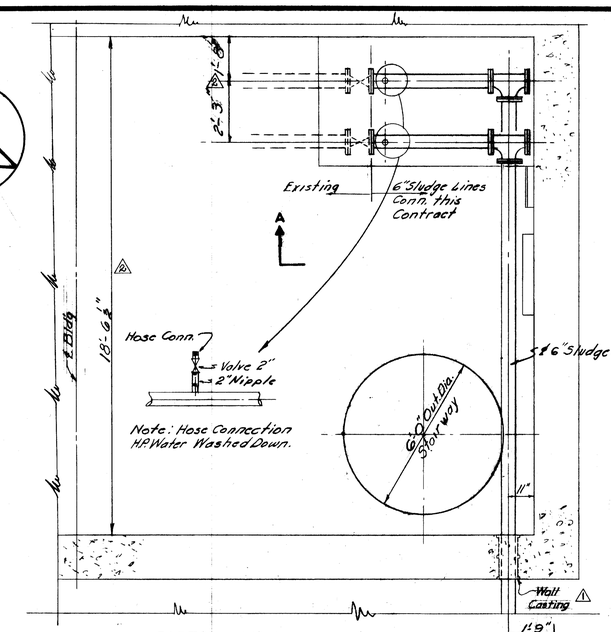
DESIGNED GKH & CWS TRACED
DETAILED GWB CHECKED

Job No. 52 34D

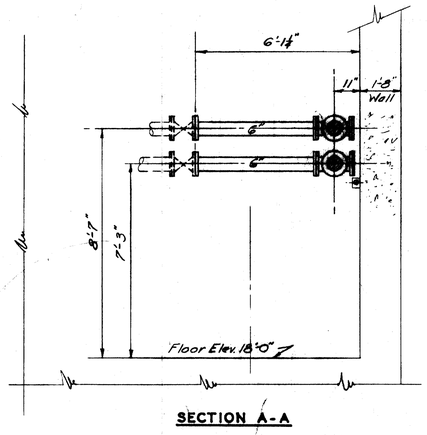
SCALE 1 1/2"=1'-0"

25-34D -115-

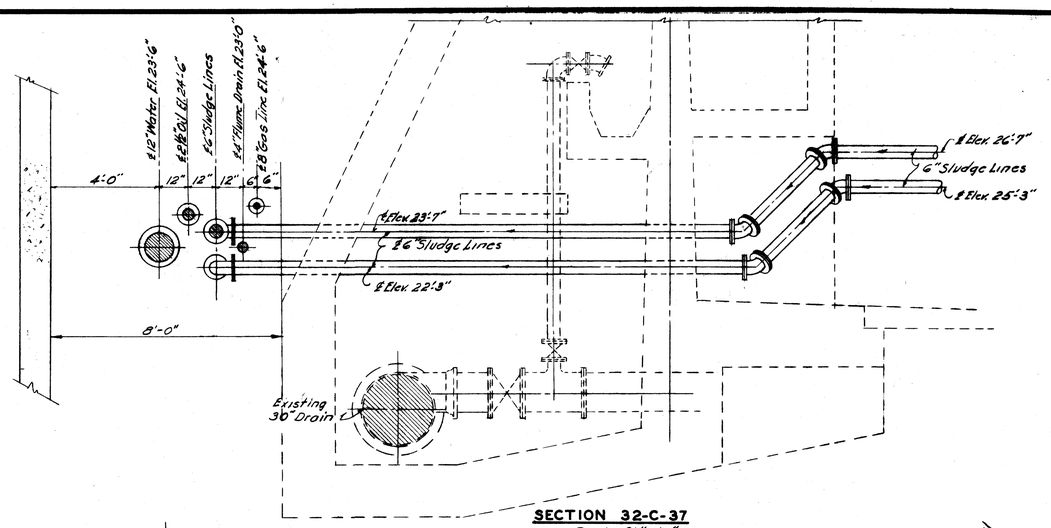
25-34D -113-



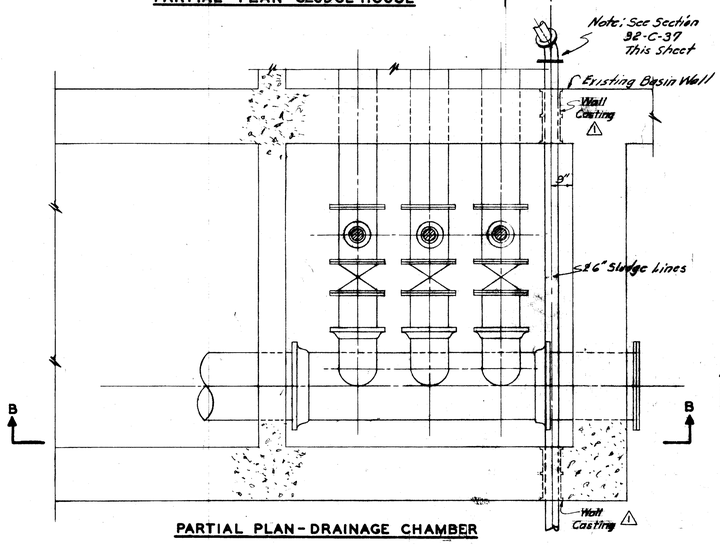
PARTIAL PLAN - SLUDGE-HOUSE



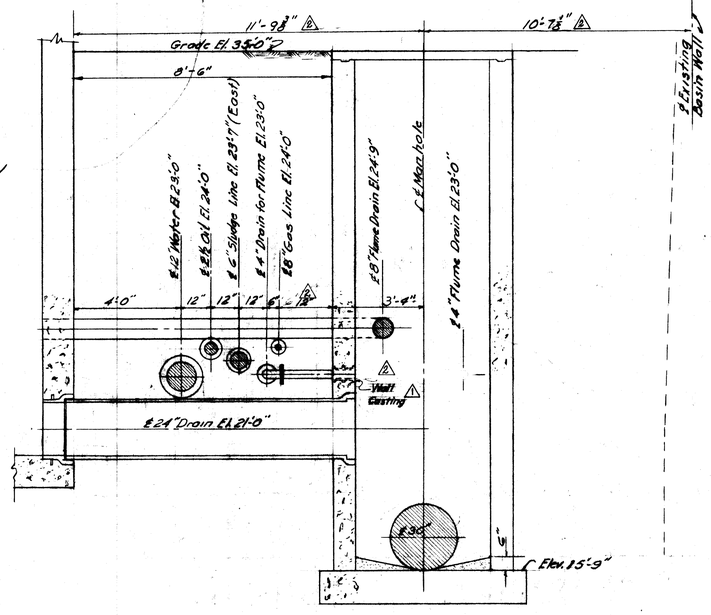
SECTION A-A



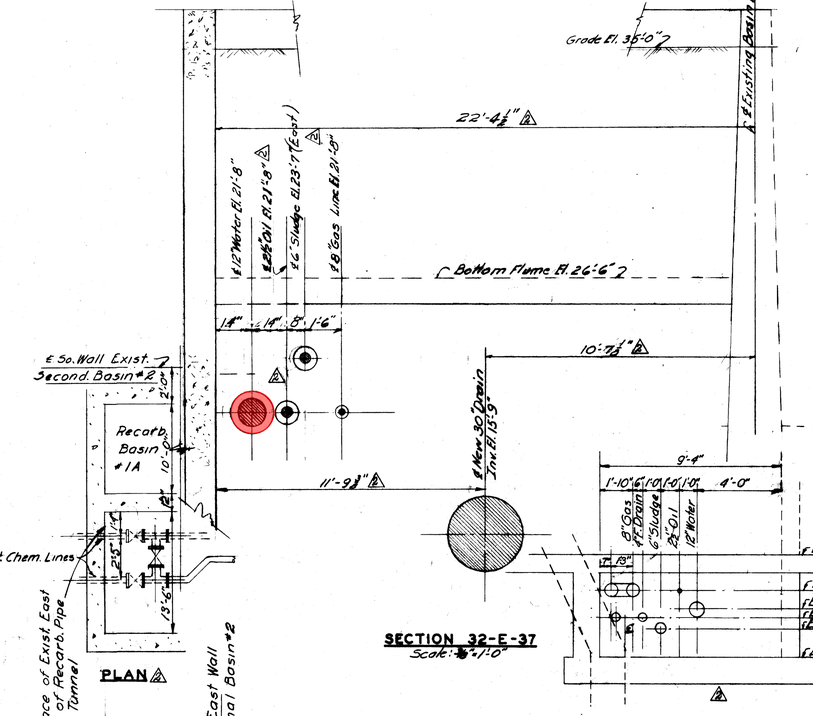
SECTION 32-C-37
Scale: 3/8"=1'-0"



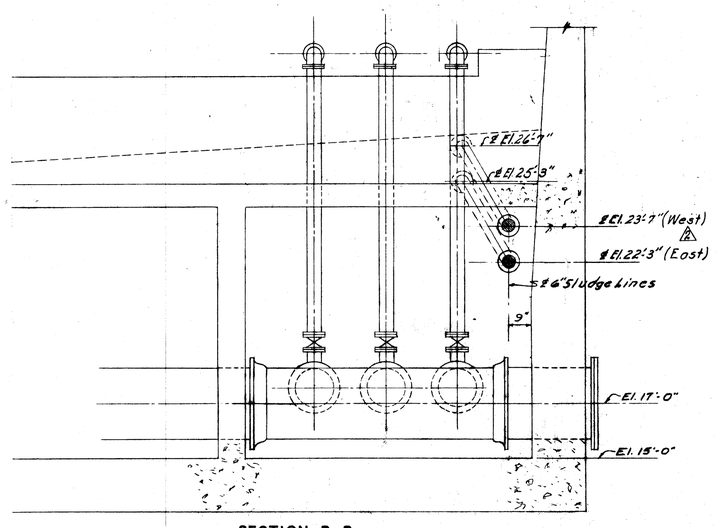
PARTIAL PLAN - DRAINAGE CHAMBER



SECTION 32-D-37
Scale: 3/8"=1'-0"

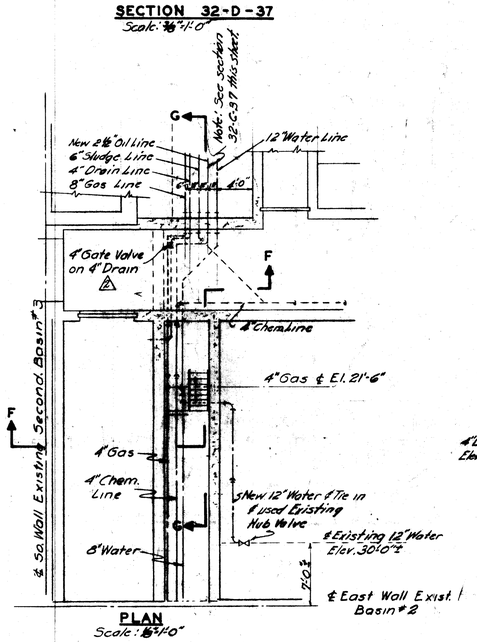


SECTION 32-E-37
Scale: 3/8"=1'-0"

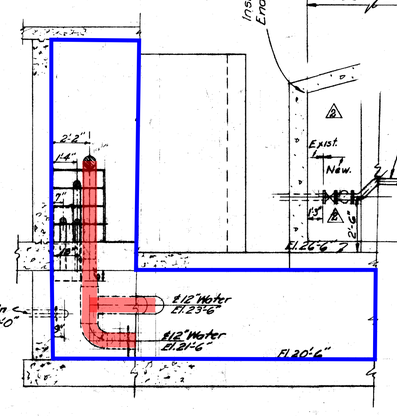


SECTION B-B

SLUDGE LINES FROM EXISTING SECONDARY SLUDGE HOUSE
Scale: 3/8"=1'-0"

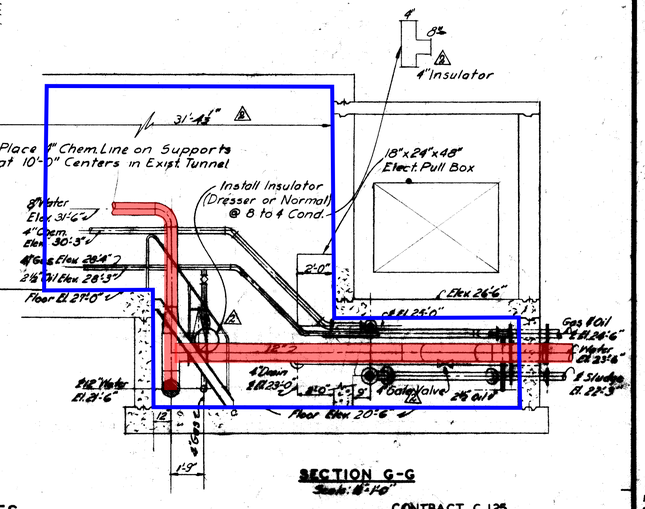


PLAN
Scale: 1/4"=1'-0"



SECTION F-F
Scale: 1/4"=1'-0"

PIPING CONNECTIONS TO EXISTING LINES



SECTION G-G
Scale: 1"=1'-0"

NO	DATE	BY	REVISION
1	6-3-55	H.B.S.	Added wall castings.
2	1-2-57	F.L.	As Built.

CONTRACT C 125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

GLENN E. HANOS — STATE OF MISSOURI — NUMBER E-2317 — REGISTERED PROFESSIONAL ENGINEER

AS BUILT

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

1955

DESIGNED GEH & CHB | TRACED EAM | CHECKED CHB & EAM | APPROVED GEH

JOB NO. 52-34D

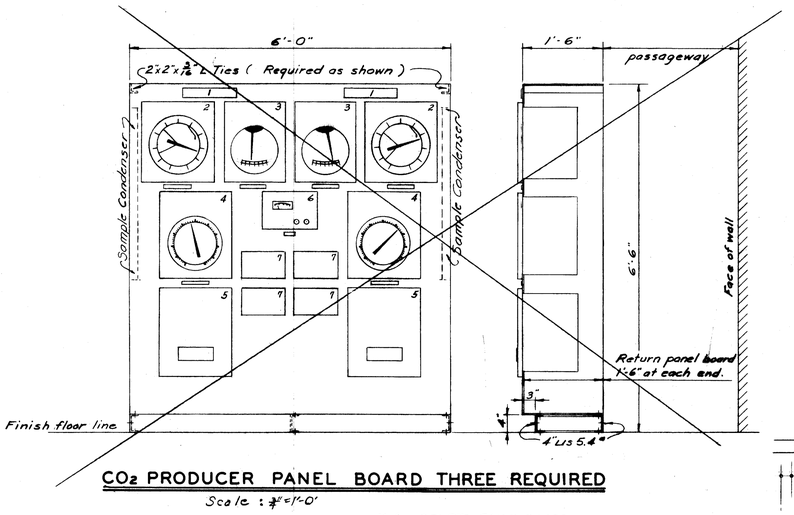
SCALE: 1" AS NOTED

SHEET NO. 54-37

MICROFILMED

25-34D -113-

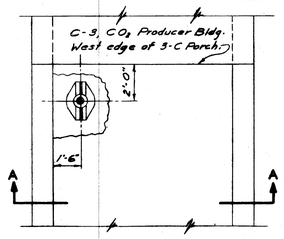
25 340 -11-



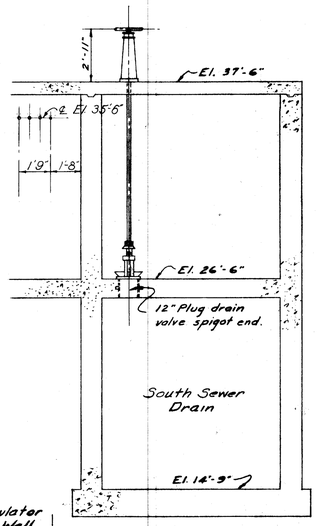
CO_2 PRODUCER PANEL BOARD THREE REQUIRED

Scale : 1/2"=1'-0"

Note: DELETE PANEL BOARD



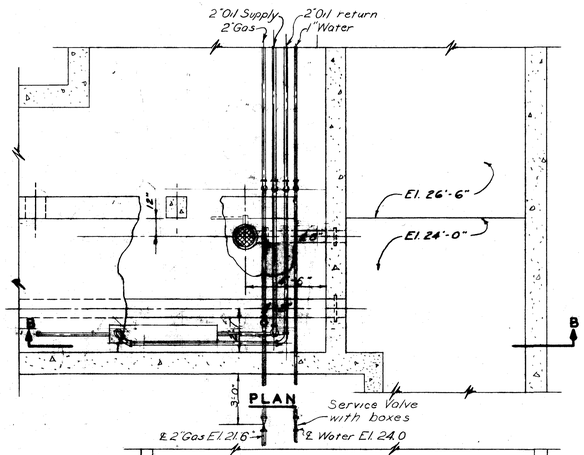
PLAN



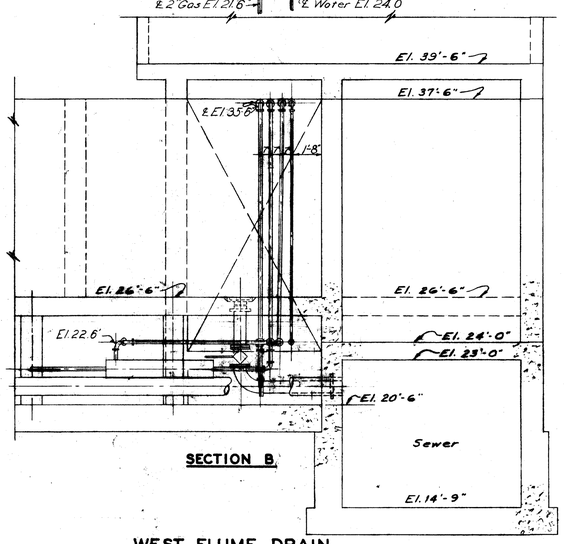
SECTION A

SOUTH FLUME DRAIN

Scale 1/2"=1'-0"



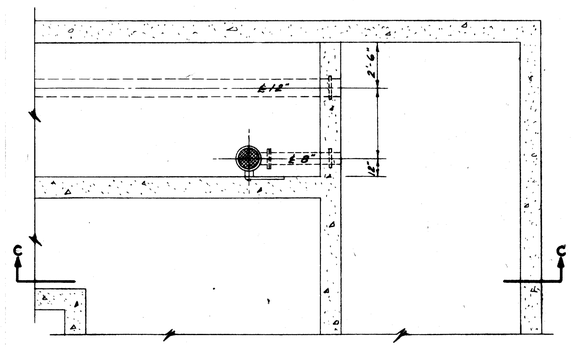
PLAN



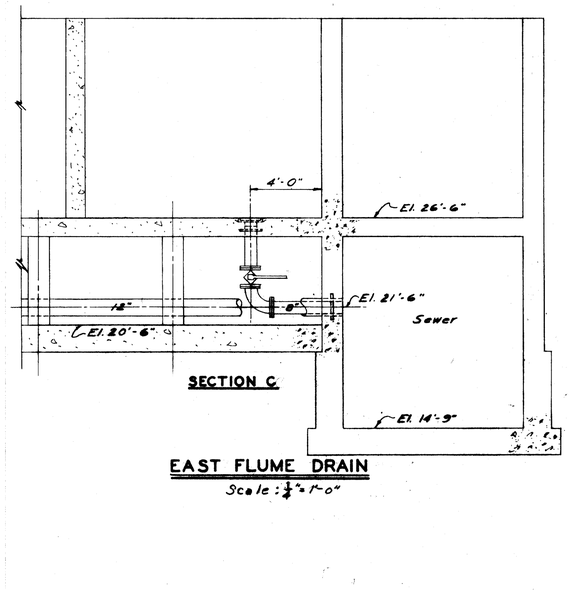
SECTION B

WEST FLUME DRAIN

Scale 1/2"=1'-0"



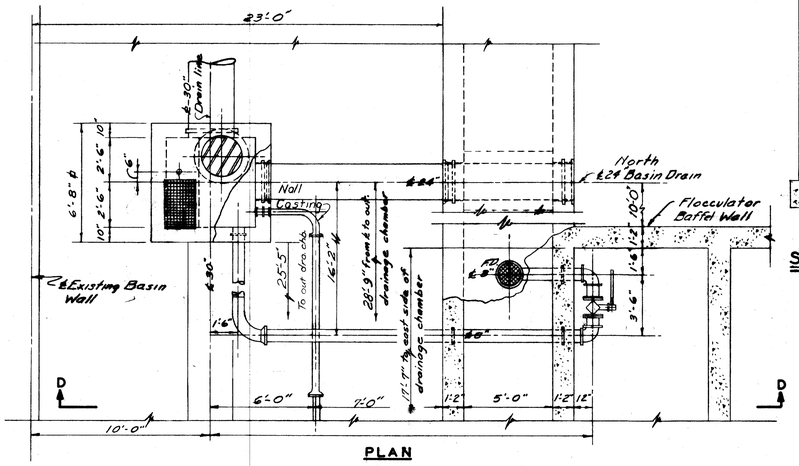
PLAN



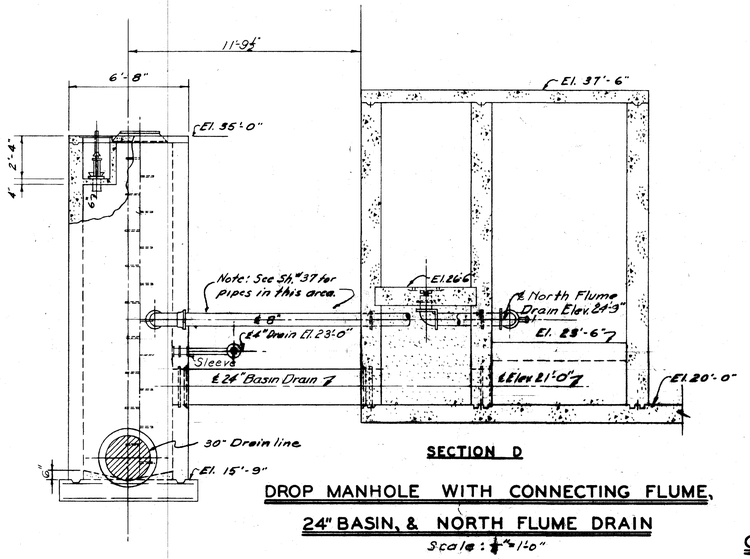
SECTION C

EAST FLUME DRAIN

Scale : 1/2"=1'-0"



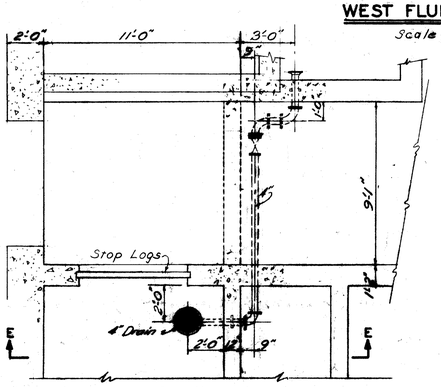
PLAN



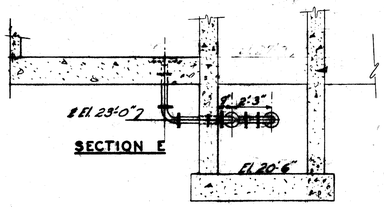
SECTION D

DROP MANHOLE WITH CONNECTING FLUME, 24" BASIN, & NORTH FLUME DRAIN

Scale : 1/2"=1'-0"



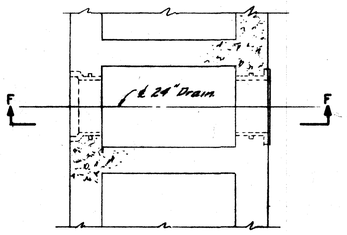
PLAN



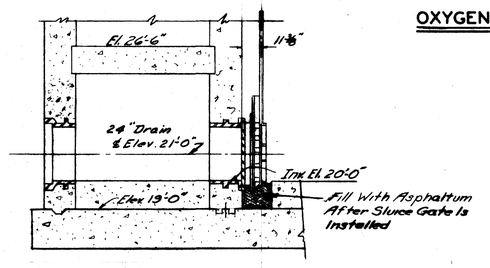
SECTION E

CONNECTING FLUME DRAIN NORTHWEST CORNER

Scale : 1/2"=1'-0"



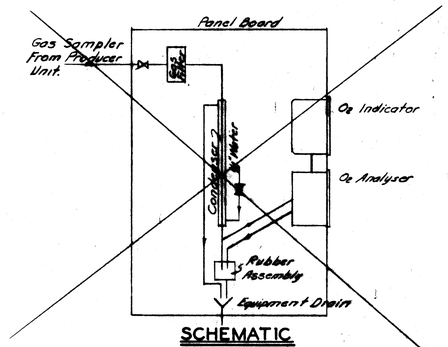
PLAN



SECTION F

NORTH 24" BASIN DRAIN

Scale: 1/2"=1'-0"



SCHEMATIC

OXYGEN ANALYSER ON GO_2 PANEL BOARD

Scale : None

Note: DELETE PANEL BOARD

NO.	DATE	BY	REVISION
1	4-16-57	A.A.A	AS Built Corrections

GLENN E. HANDS NUMBER E-2317 REGISTERED PROFESSIONAL ENGINEER STATE OF MISSOURI

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

1955

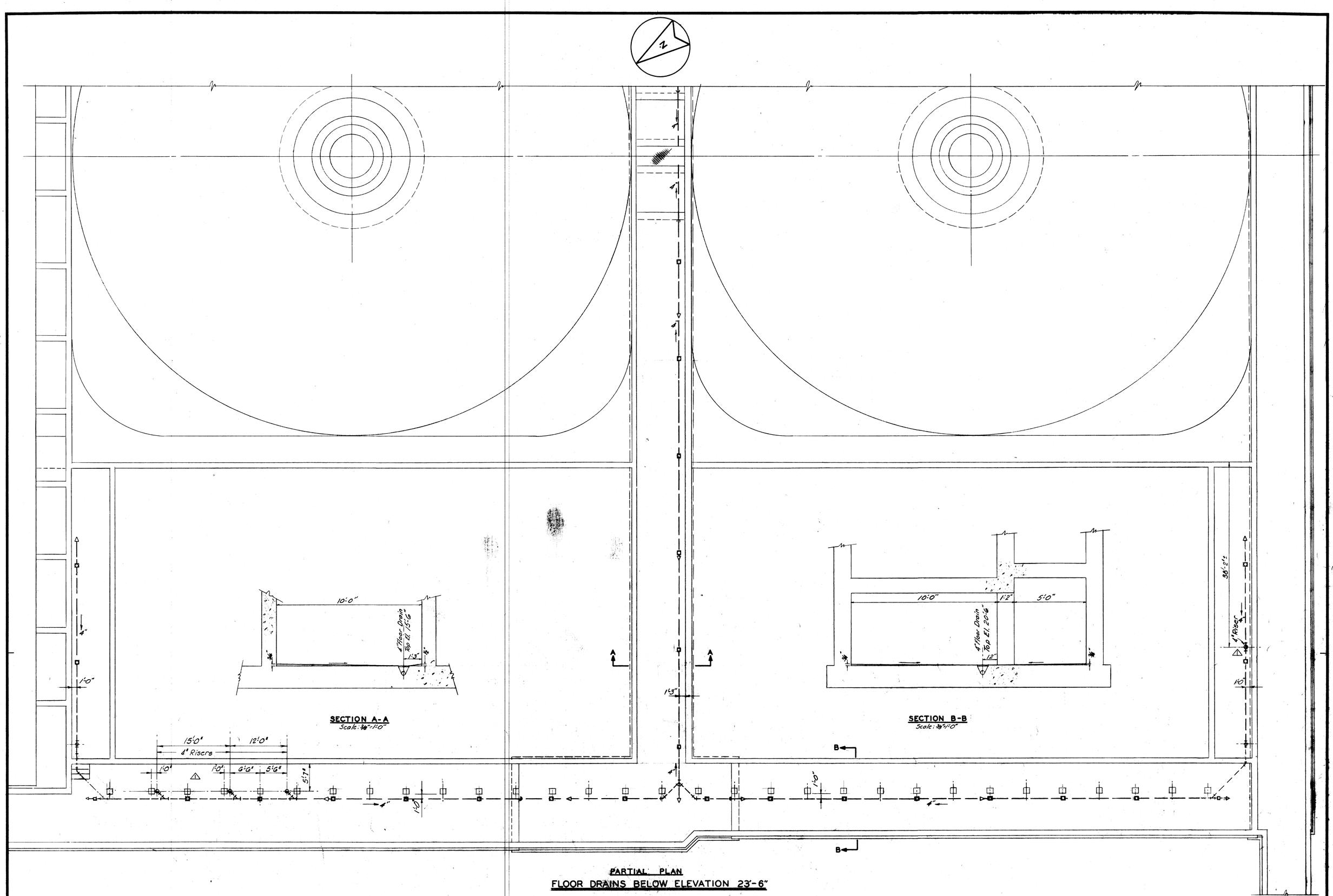
DESIGNED	GEN. & CHS	TRACED	HW
DETAILED	CHS	CHECKED	GEH

JOB NO. 52-340

SCALE : AS SHOWN

SHEET NO. 54 of 59

25-34D -112-



NO.	DATE	BY	REVISION
1	8-5-55	RF	Dimention 4" Risers Under Producer Stations 3A And 3C
	1-3-56	F.L.	As Built

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

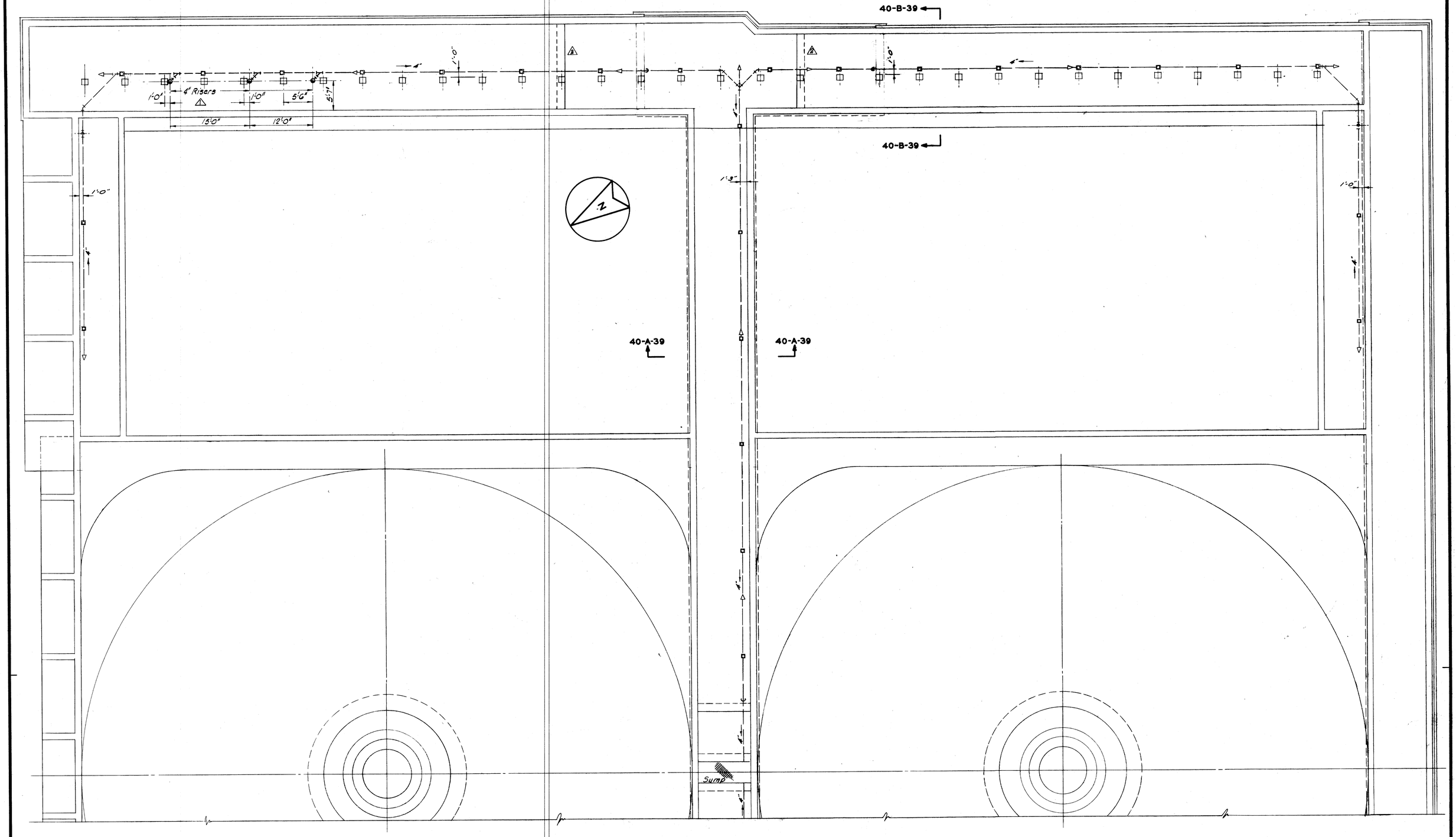
BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

STATE OF MISSOURI REGISTERED PROFESSIONAL ENGINEER
GLENN E. HANDS
NUMBER E-2317

DESIGNED GKH & CHB | TRACED HW | JOB NO. 52-34D
DETAILED CHB | CHECKED AKB | 1955
SCALE 1/2" = 1'-0"

25-34D -112-

25-340 -11c-



PARTIAL PLAN
FLOOR DRAINS BELOW ELEVATION 23'-6"

NO	DATE	BY	REVISION
1	8-5-55	RF	Dimention 4" Risers Under Producer Station 3B
2	1-2-57	F.L.	As Built.

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

GLENN E. HANDS — NUMBER E-2317 — REGISTERED PROFESSIONAL ENGINEER — STATE OF MISSOURI

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

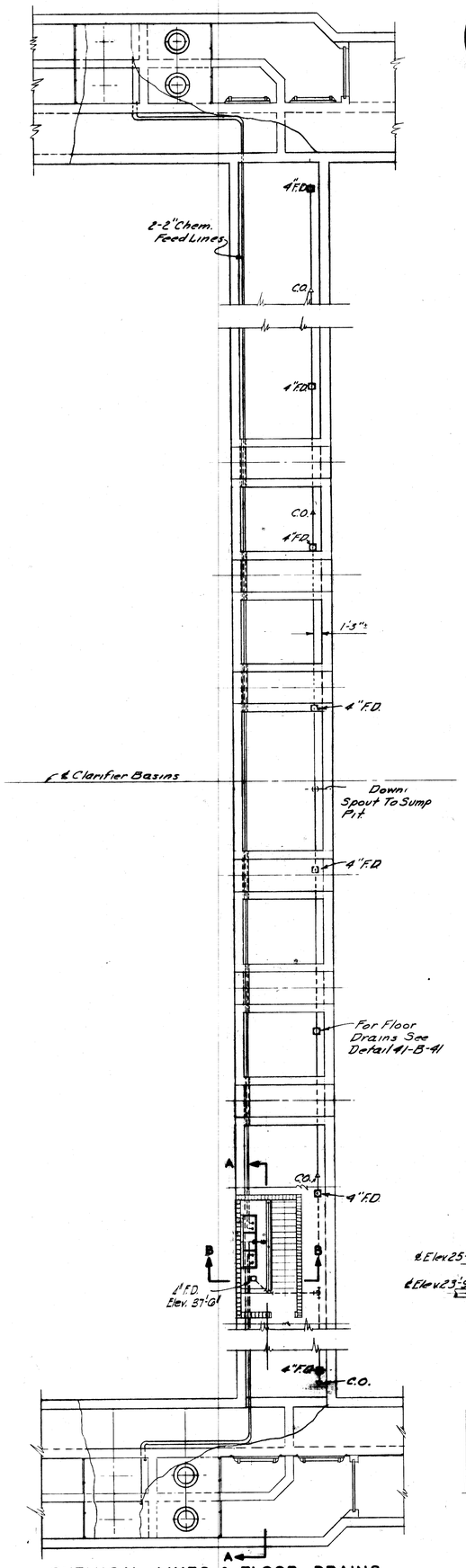
1955

DESIGNED GEH & CHB | TRACED HW | DETAILED CHB | CHECKED GEH

JOB NO. 52-34D

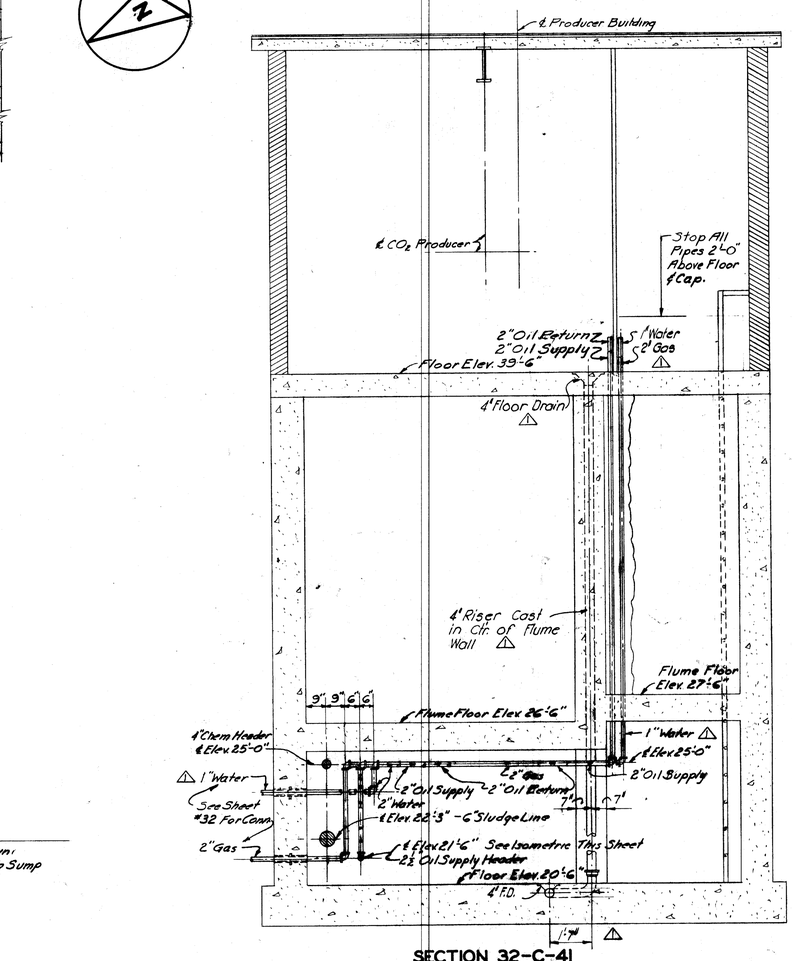
SCALE 1 1/2"=1'-0"

25-340 -11c-



CHEMICAL LINES & FLOOR DRAINS

Scale 1"=1'-0"

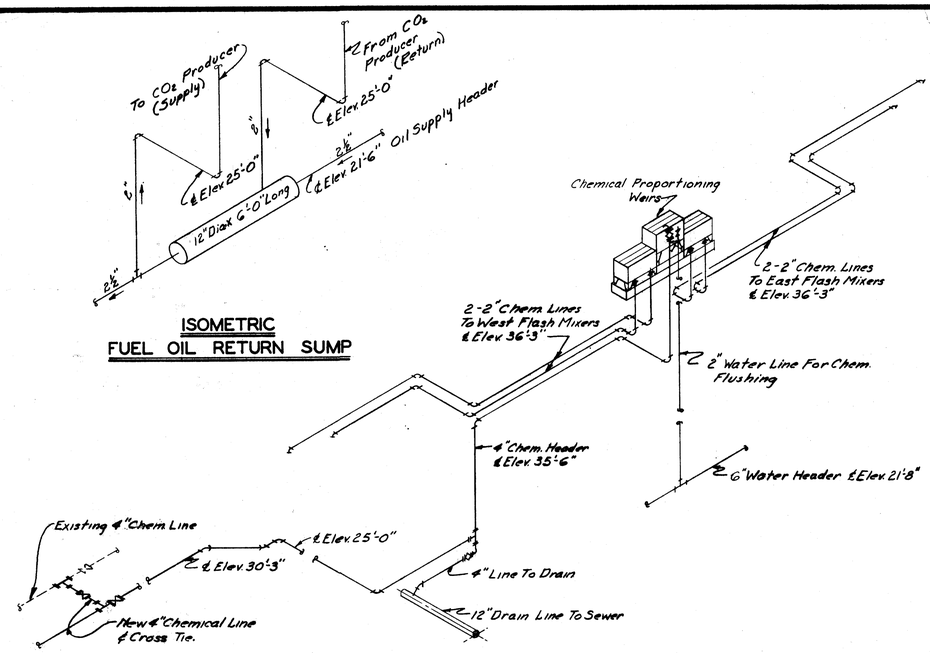


SECTION 32-C-41

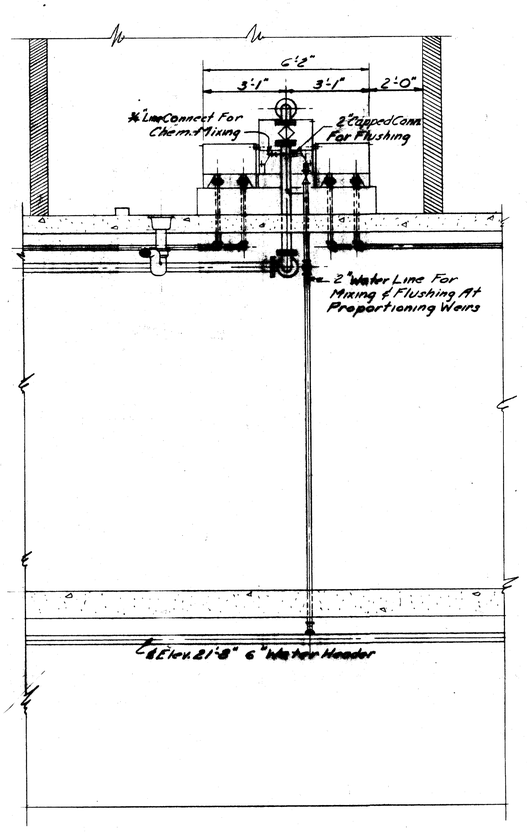
Scale: ⅜"=1'-0"

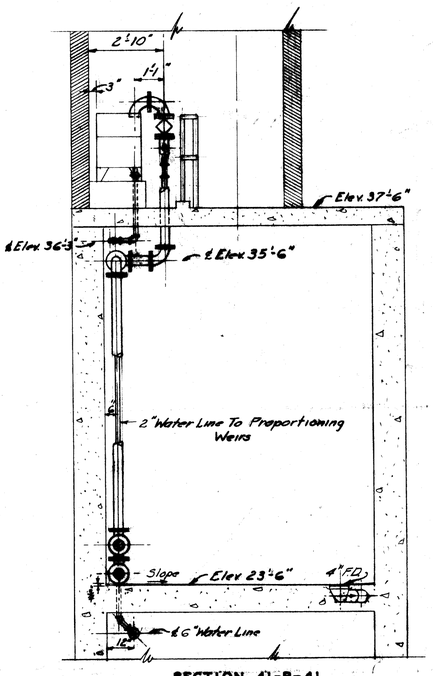
SECTION 41-A-41

Scale: ⅜"=1'-0"



ISOMETRIC OF CHEMICAL LINES & DRAINS





SECTION 41-B-41

Scale: ⅜"=1'-0"

NO.	DATE	BY	REVISION
⚠1	8-5-55	R.F.	Locate 4" Riser In Wall and Revise Piping In Section 32-C-41
	1-3-57	F.L.	As Built.

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

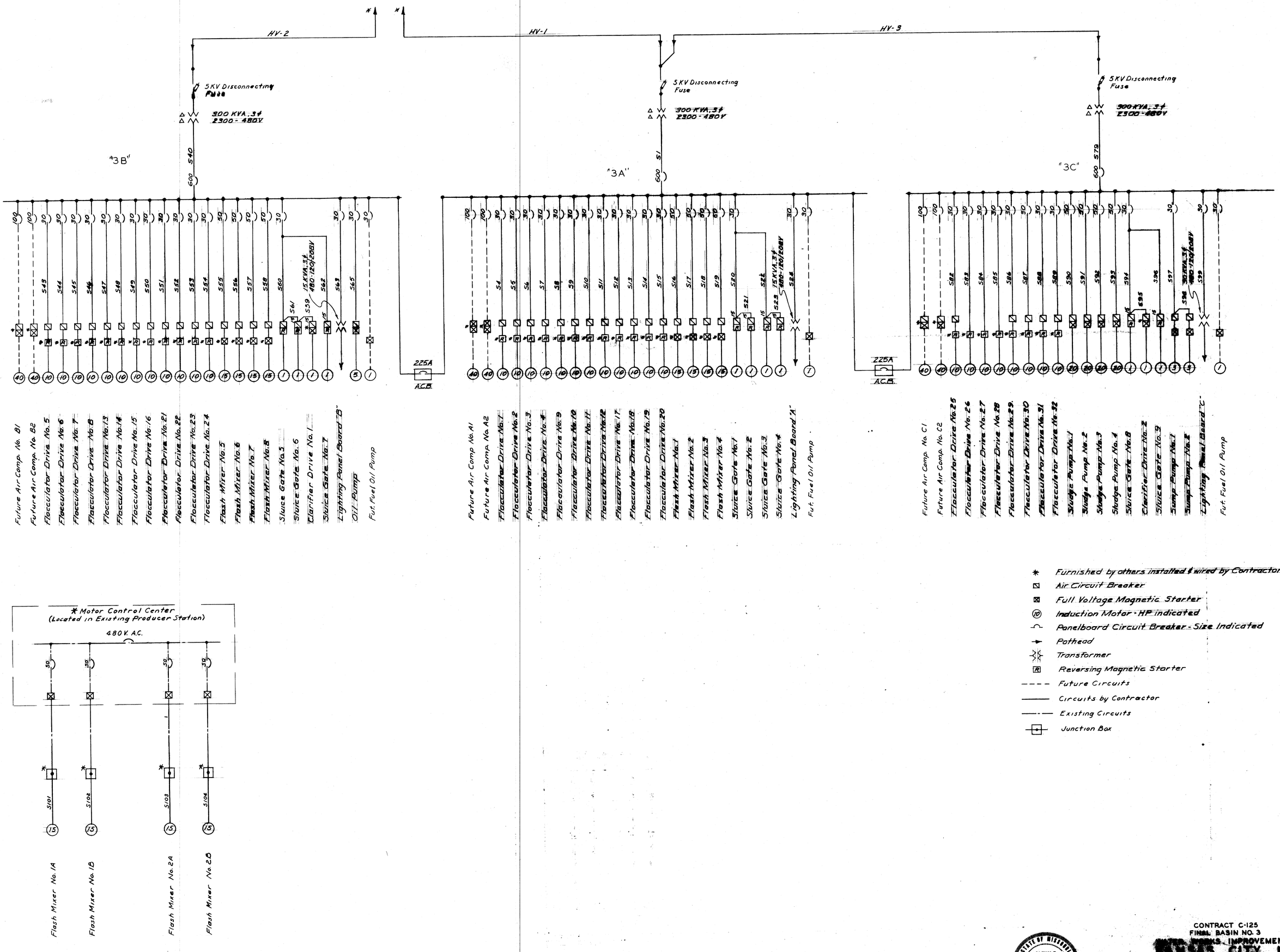
STATE OF MISSOURI — GLENN E. HANDS — NUMBER E-2217 — REGISTERED PROFESSIONAL ENGINEER

DESIGNED GEH-CHB | TRACED
DETAILED CHB | CHECKED GEH

JOB NO. 52-34D

1956

SCALE 1 AS SHOWN



- * Furnished by others installed & wired by Contractor
- Air Circuit Breaker
- Full Voltage Magnetic Starter
- (10) Induction Motor - HP indicated
- Panelboard Circuit Breaker - Size Indicated
- Pothead
- Transformer
- Reversing Magnetic Starter
- ---- Future Circuits
- ——— Circuits by Contractor
- —·— Existing Circuits
- Junction Box

NO	DATE	BY	REVISION
	1-3-57	FL	As Built

CONTRACT C-125
FINAL BASIN NO. 3
WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

REGISTERED STATE OF MISSOURI GLENN E. HANDS NUMBER E-2317 WESTERN PROFESSIONAL ENGINEER

AS BUILT

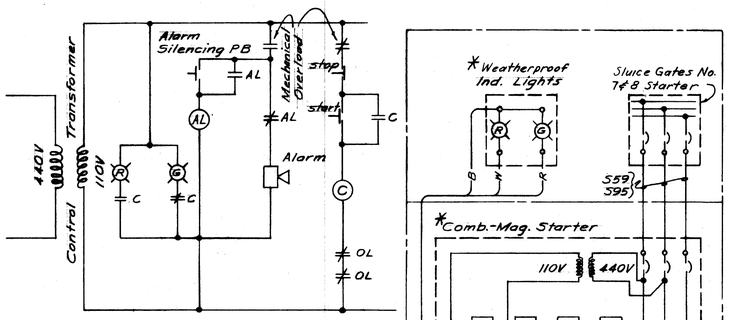
1955

DESIGNED	HRP	TRACED	HR
DETAILED	HRP	CHECKED	GEH

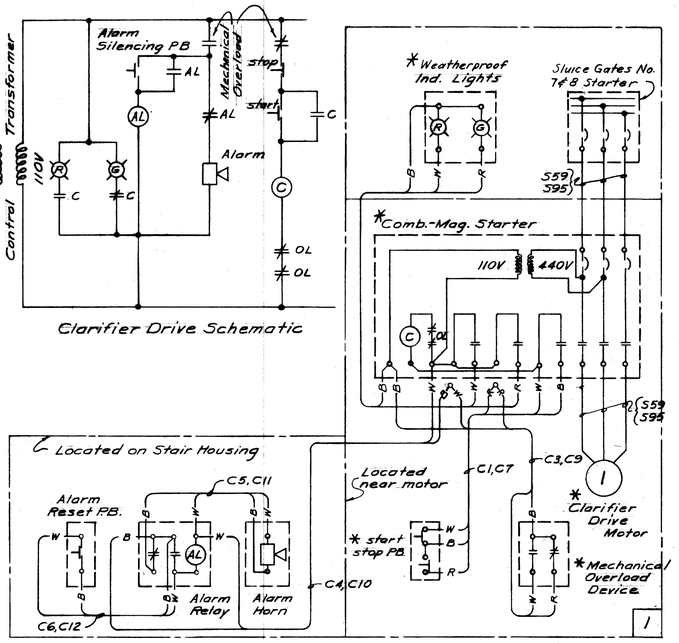
JOB NO. 52-340

22-03/A Sh 032 Sh 439

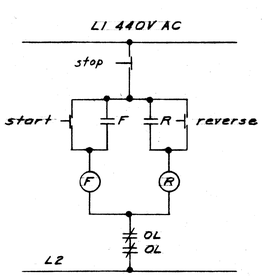
25-340 -11d-



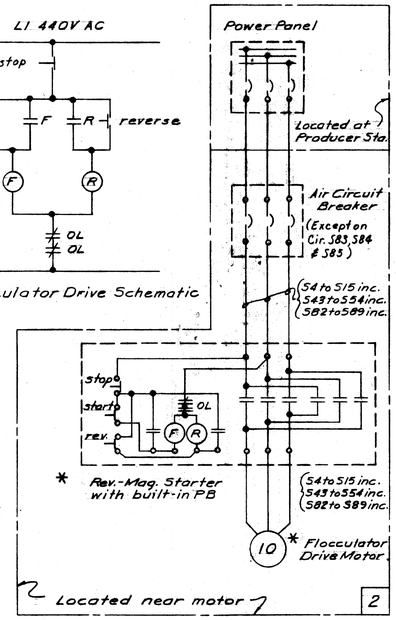
Clarifier Drive Schematic



Clarifier Drive Wiring Diagram

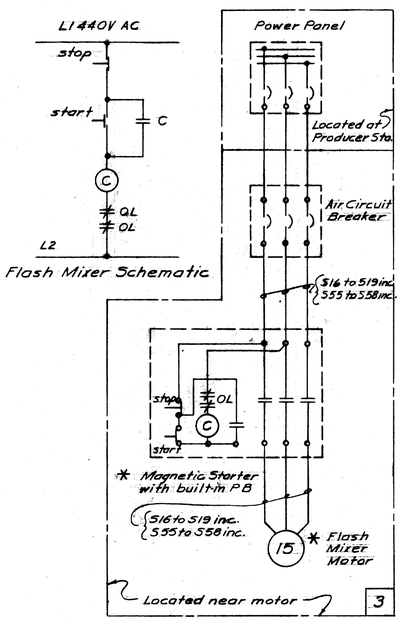


Flocculator Drive Schematic



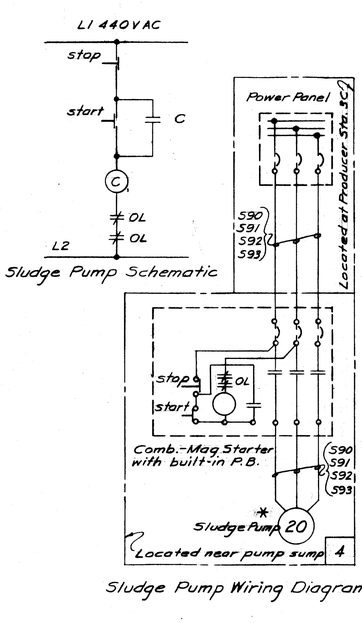
Flocculator Drive Wiring Diagram

Flash Mixer Schematic



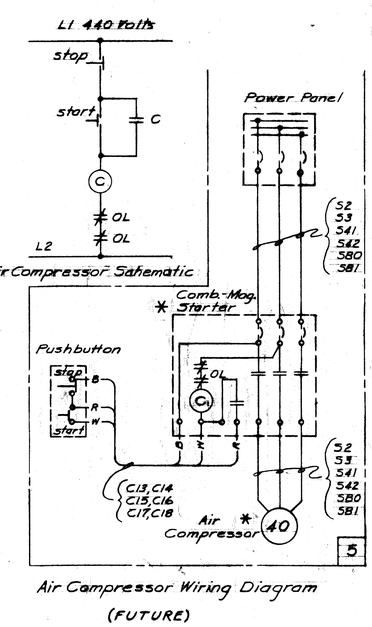
Flash Mixer Wiring Diagram
(Located on Basin No. 3)

Sludge Pump Schematic



Sludge Pump Wiring Diagram

Air Compressor Schematic



Air Compressor Wiring Diagram
(FUTURE)

Flash Mixer Schematic

Flash Mixer Wiring Diagram
(Located on Basin No. 1 & 2)

NO	DATE	BY	REVISION
	1-3-57	F.L	As Built.

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
[redacted]

GLENN E. HANDS
NUMBER E-2317
REGISTERED PROFESSIONAL ENGINEER
STATE OF NEBRASKA

DESIGNED | TRACED
DETAILED | CHECKED
JOB NO. 56-340

4/1/57

25-34D -150-

See Sheet 47

See Sheet 47

170'

559, C3

#1 Clarifier Drive

Starter, pb's & ind. lights

559, C4, C6

L-6

A9

Sump Pumps #1 #2

Sludge Pumps #3 #4

C7

595, C9

#2 Clarifier Drive

Starter, pb's & ind. lights

594, C10, C12

L-6

C8

Sluice Gate No. 1

Alarm Horn & Relay #12

Alarm Horn & Relay #28

C6

Flocculator Drives #1 #2

Starters #ACB's

Flocculator Drives #9 #10 #11

Starters #ACB's

Flocculator Drives #17 #18 #19

NOTE!
⚠ See Link-Belt drawings for proper location for power to Floc. Generators

Flocculator Drives #25 #26 #27 #28

Starters

Lgt. Panel 'C'

Lgt. Transf.

Power Panel

30 KVA Tr.

5 KV Disc. Fuse

Strtr. #ACB

pH Meter

5 KV Disc. Fuse

300 KVA Transf.

Stub Conduit 6" above floor & cap

Stub ¾" Conduit 6" above slab for pH meter

Sluice Gates #1 #2 #3 #4

Sluice Gate #8

Flash Mixers

For Continuation see detail Sheet #47

Bus Tie ACB

Power Panel

Lgt. Transf.

Lgt. Panel 'A'

LEGEND

——— Conduit runs above slab
- - - - - Conduit runs below slab
——·—— Conduit cast in slab
A9 → Combination Area & Floodlight (Lighting cir. no. & direction of flood shown)
A9 → Floodlight (Lighting cir. no. & direction of flood shown)

NO.	DATE	BY	REVISION
⚠	8-8-56	H.B.S.	Added Note.
	1-3-57	F.L.	As Built

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.
FOCUS CONDUIT, SUMP PUMP, SLUICE GATES, ETC.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

GLENN E. HANDS NUMBER E-2317 REGISTERED PROFESSIONAL ENGINEER STATE OF MISSOURI

DESIGNED	BMP	TRACED	HAP
DETAILED	HAP	CHECKED	GEH

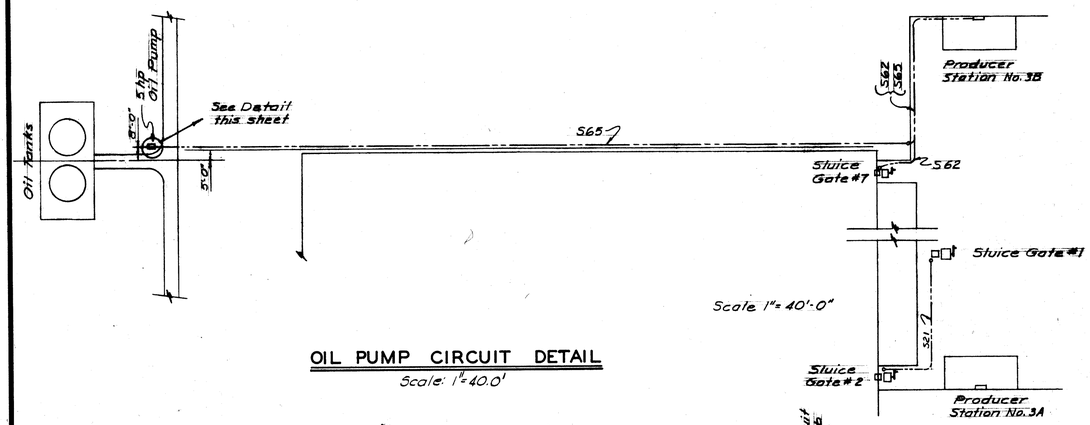
JOB NO. 52-34D

1956

SCALE : 1/8" = 1'-0"

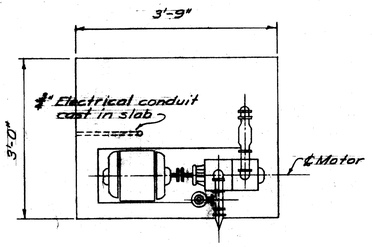
SHEET NO. 46

25-37D -151-



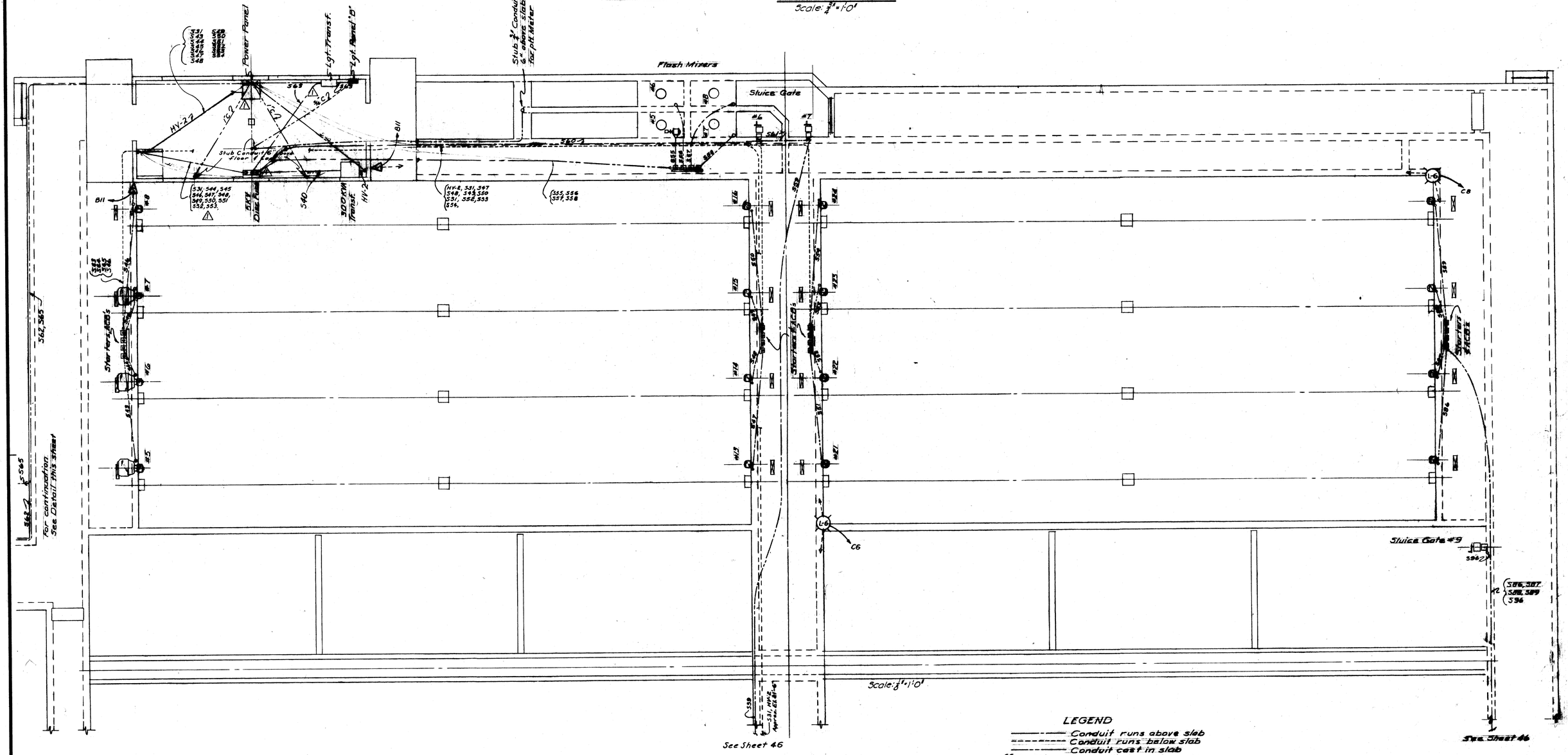
OIL PUMP CIRCUIT DETAIL

Scale: 1"= 40.0'



DETAIL OIL PUMP

Scale: ¾"=1'0"



LEGEND

- Conduit runs above slab
- Conduit runs below slab
- Conduit cast in slab
- C6 L-6 → Combination Area & Floodlight (Lighting cir. no. & direction of flood shown)
- B11 → Floodlight (Lighting cir. no. & direction of flood shown)

AS BUILT

CONTRACT C-122
FINAL BASIN NO. 8
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

1955

NO.	DATE	BY	REVISION
1	1-2-57	F.L.	As Built

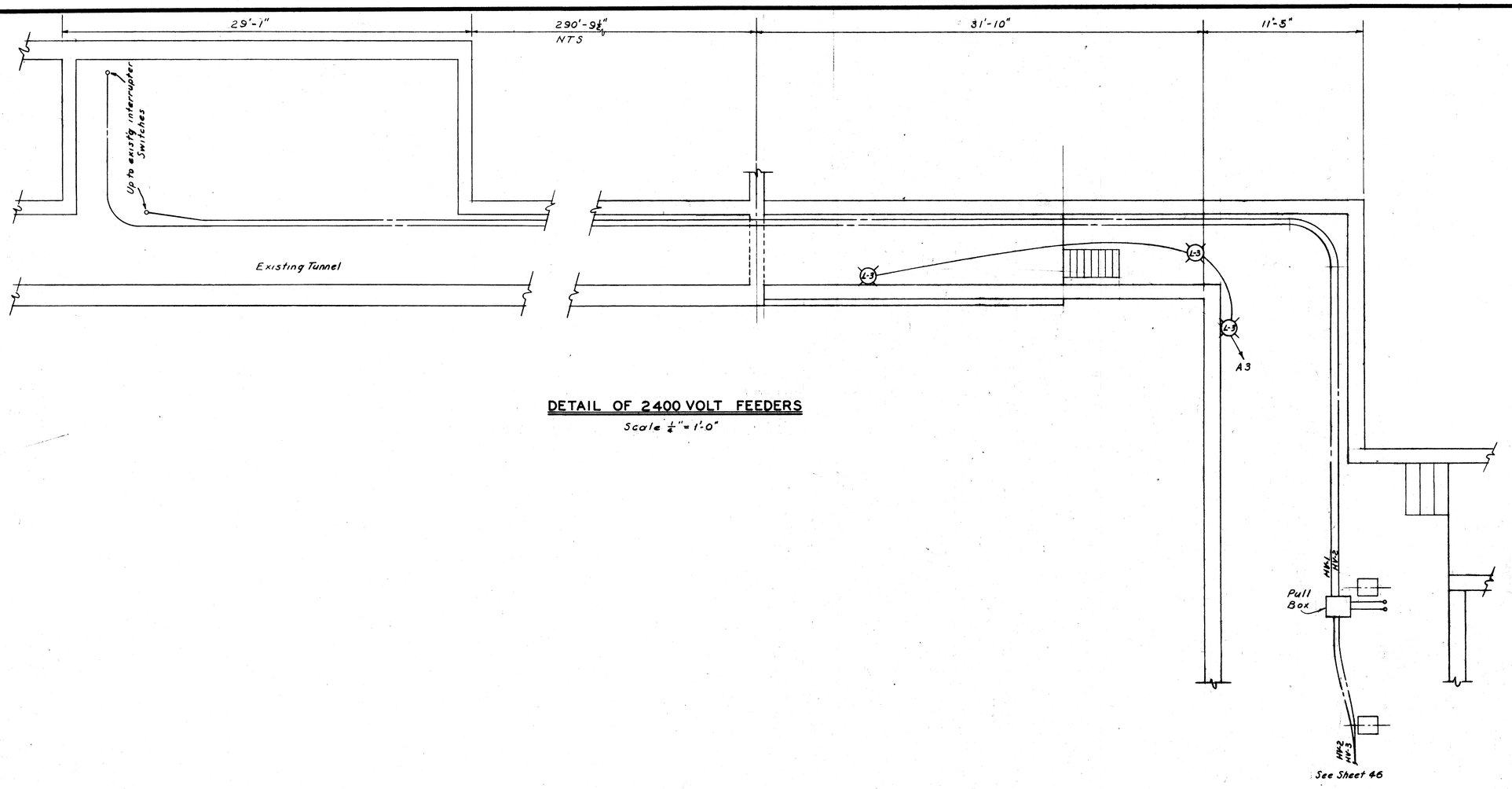
GLENN E. HANDS — NUMBER E-2317 — REGISTERED PROFESSIONAL ENGINEER — STATE OF MISSOURI

DESIGNED HWP | TRACED HW
DETAILED HWP | CHECKED RCH

JOB NO. 5.0-1955

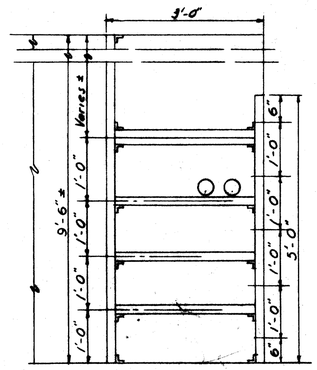
SCALE AS SHOWN

25-340 -155-



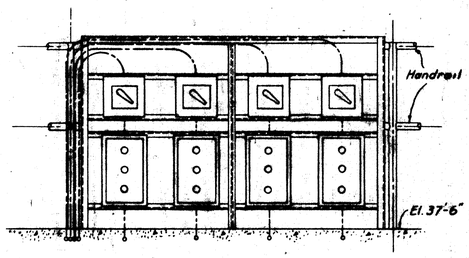
DETAIL OF 2400 VOLT FEEDERS

Scale ¼"=1'-0"



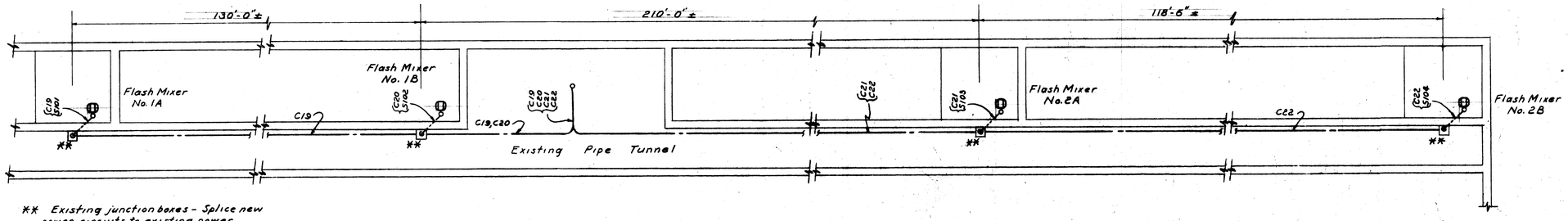
TYPICAL RACK DETAIL IN PIPE TUNNEL

Scale ¾"=1'-0"



CIRCUIT BREAKER & STARTER SUPPORT

Scale: ¾"=1'-0"



** Existing junction boxes - Splice new power circuits to existing power circuits which have been terminated in these boxes.

BASINS NO. 1 & NO. 2 FLASH MIXER CIRCUITS

Scale: ⅛"=1'-0"

NO.	DATE	BY	REVISION
	1-3-57	F.L	As Built

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

GLENN E. HANDS NUMBER E-2317 REGISTERED PROFESSIONAL ENGINEER STATE OF MISSOURI

AS BUILT

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

1956

DESIGNED	HRP	TRACED	HW
DETAILED	HRR	CHECKED	GEH

JOB NO. 52-340

SCALE : AS SHOWN

25-340 -155-

POWER CIR. NO.	FROM EQUIPMENT: EQUIPMENT DESCRIPTION	FROM EQUIPMENT: MFGR'S REFERENCE DRAWING	FROM EQUIPMENT: FLR. ELEV	FROM EQUIPMENT: LOCATION	TO EQUIPMENT: EQUIPMENT DESCRIPTION	TO EQUIPMENT: MFGR'S REFERENCE DRAWING	TO EQUIPMENT: FLR. ELEV.	TO EQUIPMENT: LOCATION	EQUIPMENT RATING: HP or KVA	EQUIPMENT RATING: PWR VOLTAGE volts	EQUIPMENT RATING: CONT-VOLTAGE volts	EQUIPMENT RATING: FULL LOAD CUR. amps	POWER CIRCUIT DATA: NO. OF CONDUCTORS	POWER CIRCUIT DATA: SIZE MCM or AWG	POWER CIRCUIT DATA: TYPE CABLE INSULATION	POWER CIRCUIT DATA: SIZE CONDUIT	POWER CIRCUIT DATA: CABLE TROUGH	DISCONNECT DEVICE: PNLBD ACB amps	DISCONNECT DEVICE: LOCATION	DISCONNECT DEVICE: DISC. SW. amps	DISCONNECT DEVICE: DISC. ACB amps	DISCONNECT DEVICE: FLR. ELEV.	MOTOR STARTER DATA: TYPE	MOTOR STARTER DATA: NEMA ENCLOSURES	MOTOR STARTER DATA: FLR. ELEV.	MOTOR STARTER DATA: LOCATION	CONTROL DEVICES: CONT. DEVICE TYPE	CONTROL DEVICES: INDICATING LIGHTS	CONTROL DEVICES: NEMA ENCLOSURES	CONTROL DEVICES: FLR. ELEV.	CONTROL DEVICES: LOCATION	B&McD CONN. DRAWINGS NUMBER	REMARKS
HV-1	INTERRUPTER SW	CENTRAL ELEC.K-103	39'0"	EXISTG. PROD.STA	POWER TRANSFORMER No.1		39'6"	PROD STA.3A	300	2400	x	72	1-3/c	250	VCL	3	x	x	x	100	x	39'6"	x	x	x	x	x	x	x	x	x	x	x	x	x	USE 3-1/C #2 TYPE ORN CONDUCTOR FROM 100 AMP
HV-2	INTERRUPTER SW	CENTRAL ELEC.K-103	39'0"	EXISTG. PROD.STA	POWER TRANSFORMER No.2		39'6"	PROD STA.3B	300	2400	x	72	1-3/c	250	VCL	3	x	x	x	100	x	39'6"	x	x	x	x	x	x	x	x	x	x	x	x	x	DISCONNECTING FUSE TO TRANSFORMER PRIMARY
HV-3	DISCONNECTING FUSE		39'6"	PROD STA.3A	POWER TRANSFORMER No.3		39'6"	PROD STA.3C	300	2400	x	72	1-3/c	250	VCL	3	x	x	x	100	x	39'6"	x	x	x	x	x	x	x	x	x	x	x	x	x	
S-1	POWER TRANSFORMER No.1 (SECONDARY)		39'6"	PROD STA.3A	POWER PANEL No.3A		39'6"	PROD STA.3A	300	480	x	361	3-1/c	500	SRN	3	x	600	PROD STA.3A	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
S-4	POWER PANEL No.3A		39'6"	PROD STA.3A	FLOCCULATOR DRIVE No.1		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3A	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR.	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-5	POWER PANEL No.3A		39'6"	PROD STA.3A	FLOCCULATOR DRIVE No.2		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3A	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR.	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-6	POWER PANEL No.3A		39'6"	PROD STA.3A	FLOCCULATOR DRIVE No.3		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3A	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR.	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-7	POWER PANEL No.3A		39'6"	PROD STA.3A	FLOCCULATOR DRIVE No.4		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3A	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR.	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-8	POWER PANEL No.3A		39'6"	PROD STA.3A	FLOCCULATOR DRIVE No.9		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3A	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR.	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-9	POWER PANEL No.3A		39'6"	PROD STA.3A	FLOCCULATOR DRIVE No.10		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3A	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR.	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-10	POWER PANEL No.3A		39'6"	PROD STA.3A	FLOCCULATOR DRIVE No.11		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3A	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR.	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-11	POWER PANEL No.3A		39'6"	PROD STA.3A	FLOCCULATOR DRIVE No.12		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3A	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR.	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-12	POWER PANEL No.3A		39'6"	PROD STA.3A	FLOCCULATOR DRIVE No.17		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3A	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR.	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-13	POWER PANEL No.3A		39'6"	PROD STA.3A	FLOCCULATOR DRIVE No.18		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3A	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR.	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-14	POWER PANEL No.3A		39'6"	PROD STA.3A	FLOCCULATOR DRIVE No.19		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3A	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR.	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-15	POWER PANEL No.3A		39'6"	PROD STA.3A	FLOCCULATOR DRIVE No.20		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3A	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR.	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-16	POWER PANEL No.3A		39'6"	PROD STA.3A	FLASH MIXER No.1		37'6"	BASIN #3	15	480	480	20	3-1/c	10	SRN	3/4	x	50	PROD STA.3A	x	50	37'6"	MAGNETIC*	IV	37'6"	NEAR MTR.	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	3	
S-17	POWER PANEL No.3A		39'6"	PROD STA.3A	FLASH MIXER No.2		37'6"	BASIN #3	15	480	480	20	3-1/c	10	SRN	3/4	x	50	PROD STA.3A	x	50	37'6"	MAGNETIC*	IV	37'6"	NEAR MTR.	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	3	
S-18	POWER PANEL No.3A		39'6"	PROD STA.3A	FLASH MIXER No.3		37'6"	BASIN #3	15	480	480	20	3-1/c	10	SRN	3/4	x	50	PROD STA.3A	x	50	37'6"	MAGNETIC*	IV	37'6"	NEAR MTR.	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	3	
S-19	POWER PANEL No.3A		39'6"	PROD STA.3A	FLASH MIXER No.4		37'6"	BASIN #3	15	480	480	20	3-1/c	10	SRN	3/4	x	50	PROD STA.3A	x	50	37'6"	MAGNETIC*	IV	37'6"	NEAR MTR.	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	3	
S-20	POWER PANEL No.3A		39'6"	PROD STA.3A	SLUICE GATE No.1		37'6"	BASIN #3	1	480	480	1.8	3-1/c	10	SRN	3/4	x	30	PROD STA.3A	x	15	37'6"	COMB.-REV-MAG	IV	37'6"	NEAR MTR.	PB	x	IV	37'6"	NEAR STARTER	x	x	x	x	x		
S-21	SLUICE GATE No.1 STARTER		37'6"	BASIN #3	SLUICE GATE No.2		39'0"	SECOND BASIN #3	1	480	480	1.8	3-1/c	10	SRN	3/4	x	x	x	x	15	39'0"	COMB-REV-MAG	IV	39'0"	NEAR MTR.	PB	x	IV	39'0"	NEAR STARTER	x	x	x	x	x		
S-22	POWER PANEL No.3A		39'6"	PROD STA.3A	SLUICE GATE No.3		37'6"	BASIN #3	1	480	480	1.8	3-1/c	10	SRN	3/4	x	x	x	x	15	37'6"	COMB-REV-MAG	IV	37'6"	NEAR MTR.	PB	x	IV	37'6"	NEAR STARTER	x	x	x	x	x		
S-23	SLUICE GATE No.3 STARTER		37'6"	BASIN #3	SLUICE GATE No.4		37'6"	BASIN #3	1	480	480	1.8	3-1/c	10	SRN	3/4	x	x	x	x	15	37'6"	COMB-REV-MAG	IV	37'6"	NEAR MTR.	PB	x	IV	37'6"	NEAR STARTER	x	x	x	x	x		
S-24	POWER PANEL No.3A		39'6"	PROD STA.3A	LIGHTING PANELBOARD No.A		39'6"	PROD STA.3A	15	480-120/208	x	18	3-1/c	10	SRN	3/4	x	30	POWER PANEL 3A	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	USE 4-1/C #8, TYPE SRN, 1" CONDUIT FROM TRANSF. TO PANEL
S-31	POWER PANEL No.3A		39'6"	PROD STA.3A	POWER PANEL No.3B		39'6"	PROD STA.3B	190	480	x	230	3-1/c	4/0	SRN	2½	x	x	x	x	225	39'6"	x	x	x	x	x	x	x	x	x	x	x	x	x	
S-32	POWER PANEL No.3A		39'6"	PROD STA.3A	POWER PANEL No.3C		39'6"	PROD STA.3B	190	480	x	230	3-1/c	4/0	SRN	2½	x	x	x	x	225	39'6"	x	x	x	x	x	x	x	x	x	x	x	x	x	
S-40	POWER TRANSFORMER No.2 (SECONDARY)		39'6"	PROD STA.3B	POWER PANEL No.3B		39'6"	PROD STA.3B	300	480	x	361	3-1/c	500	SRN	3	x	600	PROD STA.3B	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
S-43	POWER PANEL No.3B		39'6"	PROD STA.3B	FLOCCULATOR DRIVE No.5		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3B	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-44	POWER PANEL No.3B		39'6"	PROD STA.3B	FLOCCULATOR DRIVE No.6		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3B	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-45	POWER PANEL No.3B		39'6"	PROD STA.3B	FLOCCULATOR DRIVE No.7		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3B	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-46	POWER PANEL No.3B		39'6"	PROD STA.3B	FLOCCULATOR DRIVE No.8		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3B	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-47	POWER PANEL No.3B		39'6"	PROD STA.3B	FLOCCULATOR DRIVE No.13		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3B	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-48	POWER PANEL No.3B		39'6"	PROD STA.3B	FLOCCULATOR DRIVE No.14		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3B	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-49	POWER PANEL No.3B		39'6"	PROD STA.3B	FLOCCULATOR DRIVE No.15		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3B	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-50	POWER PANEL No.3B		39'6"	PROD STA.3B	FLOCCULATOR DRIVE No.16		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3B	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-51	POWER PANEL No.3B		39'6"	PROD STA.3B	FLOCCULATOR DRIVE No.21		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3B	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-52	POWER PANEL No.3B		39'6"	PROD STA.3B	FLOCCULATOR DRIVE No.22		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3B	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-53	POWER PANEL No.3B		39'6"	PROD STA.3B	FLOCCULATOR DRIVE No.23		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3B	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-54	POWER PANEL No.3B		39'6"	PROD STA.3B	FLOCCULATOR DRIVE No.24		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3B	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-55	POWER PANEL No.3B		39'6"	PROD STA.3B	FLASH MIXER No.5		37'6"	BASIN #3	15	480	480	20	3-1/c	10	SRN	3/4	x	50	PROD STA.3B	x	50	37'6"	MAGNETIC *	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	3	
S-56	POWER PANEL No.3B		39'6"	PROD STA.3B	FLASH MIXER No.6		37'6"	BASIN #3	15	480	480	20	3-1/c	10	SRN	3/4	x	50	PROD STA.3B	x	50	37'6"	MAGNETIC *	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	3	
S-57	POWER PANEL No.3B		39'6"	PROD STA.3B	FLASH MIXER No.7		37'6"	BASIN #3	15	480	480	20	3-1/c	10	SRN	3/4	x	50	PROD STA.3B	x	50	37'6"	MAGNETIC *	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	3	
S-58	POWER PANEL No.3B		39'6"	PROD STA.3B	FLASH MIXER No.8		37'6"	BASIN #3	15	480	480	20	3-1/c	10	SRN	3/4	x	50	PROD STA.3B	x	50	37'6"	MAGNETIC *	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	3	
S-59	SLUICE GATE No.6 STARTER		37'6"	BASIN #3	CLARIFIER DRIVE No.1		37'6"	BASIN #3	1	480	120	1.8	3-1/c	10	SRN	3/4	x	30	PROD STA.3B	x	15*	37'6"	COMB-MAG.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	NEAR STARTER	x	x	x	x	x	1	
S-60	POWER PANEL No.3B		39'6"	PROD STA.3B	SLUICE GATE No.5		37'6"	BASIN #3	1	480	480	1.8	3-1/c	10	SRN	3/4	x	x	x	x	15	37'6"	COMB.-REV.-MAG.	IV	37'6"	NEAR MTR	PB	x	IV	37'6"	NEAR STARTER	x	x	x	x	x		
S-61	SLUICE GATE No.5 STARTER		37'6"	BASIN #3	SLUICE GATE No.6		37'6"	BASIN #3	1	480	480	1.8	3-1/c	10	SRN	3/4	x	x	x	x	15	37'6"	COMB.-REV.-MAG.-	IV	37'6"	NEAR MTR	PB	x	IV	37'6"	NEAR STARTER	x	x	x	x	x		
S-62	POWER PANEL No.3B		39'6"	PROD STA.3B	SLUICE GATE No.7		39'0"	SECOND BASIN #3	1	480	480	1.8	3-1/c	10	SRN	3/4	x	x	x	x	15	39'0"	COMB.-REV.-MAG.	IV	39'0"	NEAR MTR	PB	x	IV	39'0"	NEAR STARTER	x	x	x	x	x		
S-63	POWER PANEL No.3B		39'6"	PROD STA.3B	LIGHTING PANELBOARD No.B		39'6"	PROD STA.3B	15	480-120/208	x	18	3-1/c	10	SRN	3/4	x	30	POWER PANEL 3B	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	USE 4-1/C #8, TYPE SRN, 1" CONDUIT FROM TRANSF. TO PNL.
S-64	POWER PANEL No.3B		39'6"	PROD STA.3B	OIL PUMP		GRADE	OIL TANKS	5	480		7.5	3-1/c	10	SRN	3/4	x	30	POWER PANEL 3B	x	30	GRADE	COMB-MAG	IV	GRADE	OIL TANKS	PB	x	IV	GRADE	STARTER	x	x	x	x	x	x	
S-79	POWER TRANSFORMER No.3 (SECONDARY)		39'6"	PROD STA.3C	POWER PANEL No.3C		39'6"	PROD STA.3C	300	480	x	361	3-1/c	500	SRN	3	x	600	PROD STA.3C	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
S-82	POWER PANEL No.3C		39'6"	PROD STA.3C	FLOCCULATOR DRIVE No.25		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3C	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-83	POWER PANEL No.3C		39'6"	PROD STA.3C	FLOCCULATOR DRIVE No.26		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3C	x	x	x	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-84	POWER PANEL No.3C		39'6"	PROD STA.3C	FLOCCULATOR DRIVE No.27		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3C	x	x	x	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-85	POWER PANEL No.3C		39'6"	PROD STA.3C	FLOCCULATOR DRIVE No.28		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3C	x	x	x	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-86	POWER PANEL No.3C		39'6"	PROD STA.3C	FLOCCULATOR DRIVE No.29		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3C	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-87	POWER PANEL No.3C		39'6"	PROD STA.3C	FLOCCULATOR DRIVE No.30		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3C	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-88	POWER PANEL No.3C		39'6"	PROD STA.3C	FLOCCULATOR DRIVE No.31		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3C	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-89	POWER PANEL No.3C		39'6"	PROD STA.3C	FLOCCULATOR DRIVE No.32		37'6"	BASIN #3	10	480	480	14	3-1/c	10	SRN	3/4	x	30	PROD STA.3C	x	30	37'6"	MAG.-REV.*	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	STARTER	x	x	x	x	x	2	
S-90	POWER PANEL No.3C		39'6"	PROD STA.3C	SLUDGE PUMP No.1		23'6"	CENTER TUNNEL	20	480	480	26	3-1/c	6	SRN	1	x	50	PROD STA.3C	x	50	23'6"	COMB.-MAG	IV	23'6"	NEAR MTR	PB	x	IV	23'6"	STARTER	x	x	x	x	x	4	
S-91	POWER PANEL No.3C		39'6"	PROD STA.3C	SLUDGE PUMP No.2		23'6"	CENTER TUNNEL	20	480	480	26	3-1/c	6	SRN	1	x	50	PROD STA.3C	x	50	23'6"	COMB.-MAG	IV	23'6"	NEAR MTR	PB	x	IV	23'6"	STARTER	x	x	x	x	x	4	
S-92	POWER PANEL No.3C		39'6"	PROD STA.3C	SLUDGE PUMP No.3		23'6"	CENTER TUNNEL	20	480	480	26	3-1/c	6	SRN	1	x	50	PROD STA.3C	x	50	23'6"	COMB.-MAG-	IV	23'6"	NEAR MTR	PB	x	IV	23'6"	STARTER	x	x	x	x	x	4	
S-93	POWER PANEL No.3C		39'6"	PROD STA.3C	SLUDGE PUMP No.4		23'6"	CENTER TUNNEL	20	480	480	26	3-1/c	6	SRN	1	x	50	PROD STA.3C	x	50	23'6"	COMB.-MAG	IV	23'6"	NEAR MTR	PB	x	IV	23'6"	STARTER	x	x	x	x	x	4	
S-94	POWER PANEL No.3C		39'6"	PROD STA.3C	SLUICE GATE No.8		37'6"	BASIN #3	1	480	480	1.8	3-1/c	10	SRN	3/4	x	30	PROD STA.3C	x	15	37'6"	COMB-REV-MAG	IV	37'6"	NEAR MTR	PB	x	IV	37'6"	NEAR STARTER	x	x	x	x	x		
S-95	SLUICE GATE No.8 STARTER		37'6"	BASIN #3	CLARIFIER DRIVE No.2		37'6"	BASIN #3	1	480	120	1.8	3-1/c	10	SRN	3/4	x	x	x	x	15	37'6"	COMB-REV-MAG	IV	37'6"	NEAR MTR	PB*	x	IV	37'6"	NEAR STARTER	x	x	x	x	x	1	
S-96	POWER PANEL No.3C		39'6"	PROD STA.3C	SLUICE GATE No.9		37'6"	BASIN #3	1	480	480	1.8	3-1/c	10	SRN	3/4	x	x	x	x	15	37'6"	COMB-REV-MAG	IV	37'6"	NEAR MTR	PB	x	IV	37'6"	NEAR STARTER	x	x	x	x	x		
S-97	POWER PANEL No.3C		39'6"	PROD STA.3C	SUMP PUMP No.1		12'6"	CENTER TUNNEL	3	480	480	4.5	3-1/c	10	SRN	3/4	x	30	PROD STA.3C	x	15	12"-6"	COMB.-MAG.	IV	12'6"	CENTER TUNNEL	SEL. SW.	x	IV	12'6"	NEAR STARTER	x	x	x	x	x		
S-98	SUMP PUMP No.1 STARTER		12'6"	CENTER TUNNEL	SUMP PUMP No.2		12'6"	CENTER TUNNEL	3	480	480	4.5	3-1/c	10	SRN	3/4	x	x	x	x	15	12'6"	COMB.-MAG.	IV	12'6"	CENTER TUNNEL	SEL. SW.	x	IV	12'6"	NEAR STARTER	x	x	x	x	x		
S-99	POWER PANEL No.3C		39'6"	PROD STA.3C	LIGHTING PANELBOARD No.C		39'6"	PROD STA.3C	15	480	x	18	3-1/c	10	SRN	3/4	x	30	PROD STA.3C	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	USE 4-1/C #8, TYPE SRN, 1" CONDUIT FROM TRANSF. TO PANEL
S-101	EXISTING JUNCTION BOX No.1		27'0"	EXIST. PIPE TRENCH	FLASH MIXER No.1A		39'0"	BASIN 1A	15	480	120	20	3-1/c	8	SRN	3/4	x	x	x	x	x	x	x	x	x	PB	x	IV	39'0"	NEAR MOTOR	x	x	x	x	x	6	SPLICE THESE CIRCUITS TO EXISTING
S-102	EXISTING JUNCTION BOX No.2		27'0"	EXIST. PIPE TRENCH	FLASH MIXER No.1B		39'0"	BASIN 1B	15	480	120	20	3-1/c	8	SRN	3/4	x	x	x	x	x	x	x	x	x	PB	x	IV	39'0"	NEAR MOTOR	x	x	x	x	x	6	CIRCUITS WHICH WERE TERMINATED
S-103	EXISTING JUNCTION BOX No.3		27'0"	EXIST. PIPE TRENCH	FLASH MIXER No.2A		39'0"	BASIN 2A	15	480	120	20	3-1/c	8	SRN	3/4	x	x	x	x	x	x	x	x	x	PB	x	IV	39'0"	NEAR MOTOR	x	x	x	x	x	6	IN THE JUNCTION BOXES BY
S-104	EXISTING JUNCTION BOX No.4		27'0"	EXIST. PIPE TRENCH	FLASH MIXER No.2B		39'0"	BASIN 2B	15	480	120	20	3-1/c	8	SRN	3/4	x	x	x	x	x	x	x	x	x	PB	x	IV	39'0"	NEAR MOTOR	x	x	x	x	x	6	CONTRACTS C-109.

*FURNISHED BY OTHERS, INSTALLED AND WIRED BY CONTRACTOR

NO.	DATE	BY	REVISION
1	1-2-57	F.L.	As Built

AS BUILT

STATE OF MISSOURI — GLENN E. HANDS — NUMBER E-2317 — REGISTERED PROFESSIONAL ENGINEER

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.
POWER WIRING SCHEDULE
BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI
1955

DESIGNED	HRP	TRACED	WAF
DETAILED	HRP	CHECKED	GEH

JOB NO. 52-34D

SHEET -REV. 49-1

5672-031A

MICROFILMED

CONT. CIR. NO.	FROM EQUIPMENT			TO EQUIPMENT			CONTROL CIRCUIT DATA					POWER CIR. NO.	B&McD CONN. DWG. NO.	REMARKS
	EQUIPMENT DESCRIPTION	FLR. ELEV.	LOCATION	EQUIPMENT DESCRIPTION	FLR. ELEV.	LOCATION	NO. OF CONDUCTORS	SIZE CONDUCTORS	TYPE CABLE INSULATION	SIZE CONDUIT	CABLE TROUGH			
C1	CLARIFIER DRIVE NO.1 STARTER	37'6"	CLAR. DRIVE #1	START-STOP PB	37'6"	NEAR STARTER	3	19/25	CW	2"	X	S59	1	
C2	CLARIFIER DRIVE NO.1 STARTER	37'6"	CLAR. DRIVE #1	INDICATING LIGHTS	37'6"	NEAR STARTER	3	19/25	CW	2"	X	S59	1	
C3	CLARIFIER DRIVE NO.1 STARTER	37'6"	CLAR. DRIVE #1	MECHANICAL OVERLOAD SWITCHES	37'6"	NEAR MTR	3	19/25	CW	2"	X	S59	1	
C4	CLARIFIER DRIVE NO.1 STARTER	37'6"	CLAR. DRIVE #1	ALARM RELAY NO.1	37'6"	STAIR HOUSE	2	19/25	CW	2"	X	S59	1	
C5	ALARM RELAY NO.1	37'6"	STAIR HOUSE	ALARM HORN	37'6"	STAIR HOUSE	2	19/25	CW	2"	X	S59	1	
C6	ALARM RELAY NO.1	37'6"	STAIR HOUSE	ALARM RESET PB	37'6"	NEAR STARTER	2	19/25	CW	2"	X	S59	1	
C7	CLARIFIER DRIVE NO.2 STARTER	37'6"	CLAR. DRIVE #2	START-STOP PB	37'6"	NEAR STARTER	3	19/25	CW	2"	X	S95	1	
C8	CLARIFIER DRIVE NO.2 STARTER	37'6"	CLAR. DRIVE #2	INDICATING LIGHTS	37'6"	NEAR STARTER	3	19/25	CW	2"	X	S95	1	
C9	CLARIFIER DRIVE NO.2 STARTER	37'6"	CLAR. DRIVE #2	MECH.OVERLOAD SWITCHES	37'6"	NEAR MTR	3	19/25	CW	2"	X	S95	1	
C10	CLARIFIER DRIVE NO.2 STARTER	37'6"	CLAR. DRIVE #2	ALARM RELAY NO.2	37'6"	STAIR HOUSE	2	19/25	CW	2"	X	S95	1	
C11	ALARM RELAY NO.2	37'6"	STAIR HOUSE	ALARM HORN	37'6"	STAIR HOUSE	2	19/25	CW	2"	X	S95	1	
C12	ALARM RELAY NO.2	37'6"	STAIR HOUSE	ALARM RESET PB	37'6"	NEAR STARTER	2	19/25	CW	2"	X	S95	1	
		"			"									
		"			"									
		"			"									
		"			"									
		"			"									
		"			"									
C19	FLASH MIXER NO.1A STARTER	41'0"	EXISTG. MCC	START-STOP PB	39'0"	BASIN 1A	3	19/25	CW	2"	X	S 101	6	
C20	FLASH MIXER NO.1B STARTER	41'0"	EXISTG. MCC	START-STOP PB	39'0"	BASIN 1B	3	19/25	CW	2"	X	S 102	6	
C21	FLASH MIXER NO.2A STARTER	41'0"	EXISTG. MCC	START -STOP PB	39'0"	BASIN 2A	3	19/25	CW	2"	X	S 103	6	
C22	FLASH MIKER NO.2B STARTER	41'0"	EXISTG. MCC	START-STOP PB	39'0"	BASIN 2B	3	19/25	CW	2"	X	S 104	6	

NO.	DATE	BY	REVISION
	1-3-57	F.L	As Built

AS BUILT

STATE OF MISSOURI — REGISTERED PROFESSIONAL ENGINEER — GLENN E. HANDS — NUMBER E-2317

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.
CONTROL COILING SCHEDULE
BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI
1955

DESIGNED	HRP	TRACED	WAF
DETAILED	HRP	CHECKED	GEH

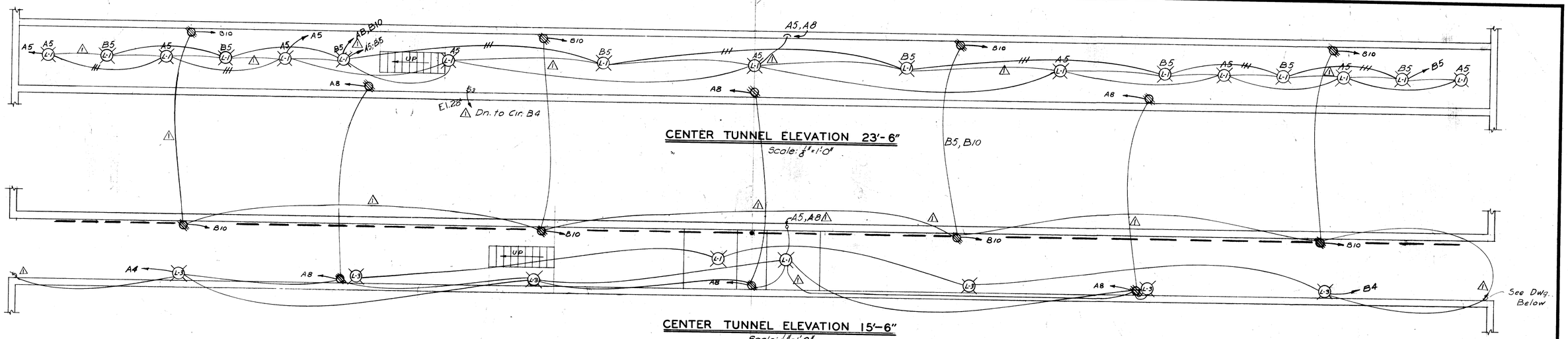
JOB NO. 52-34 D

SHEET -REV. 50 -

Sh 48/59

5672-031A

MICROFILMED



CENTER TUNNEL ELEVATION 23'-6"

Scale: 1/8"=1'-0"

CENTER TUNNEL ELEVATION 15'-6"

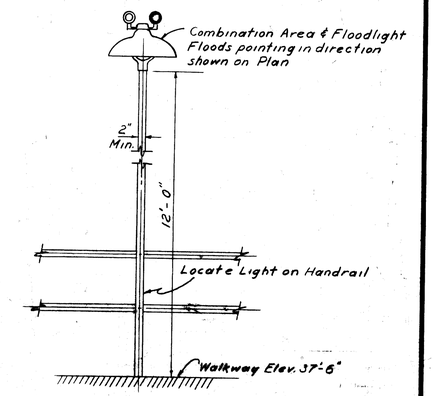
Scale: 1/8"=1'-0"

Legend

- L-1 — Incandescent Fixture, Type Indicated
- 3-Wire Twistlock Polarized Duplex
- 2-Wire Standard Duplex Receptacle
- S — Single Pole Switch
- S_3 — Three Way Switch
- Lighting Panel (120/208 V, 4 Wire)
- A1 — Home Run to Panel (Circuit No. Indicated)
- 3 wires — Note: Any Circuit without further designation
- 4 wires — indicates a two-wire circuit. For a greater number of wires indicate as shown on the left.
- Ground Rods
- No. 2/0 Ground Wire

FIXTURE SCHEDULE

Type No.	Watts (ea.)	Type Mtg.	Fixt. Elev.	Description
L-1	200	Pendent	33'-6"	Equal to Benj. "Heavy Duty" Vapor-Tight Cat. No. 6502
L-2	150	Pendent	24'-6"	Equal to Benj. "Heavy Duty" Vapor-Tight Cat. No. 6501
L-3	100	Wall	25'-6"	Equal to Benj. Angle Type "Vapolets" Cat. No. 7125X
L-4	300	Pendent	48'-6"	Equal to Benj. "Turnlox" Cat. No. 7644
L-5	100	Wall	48'-6"	Equal to Benj. Cat. No. 1914
L-6	1-300, 2-150	Pole	49'-6"	Equal to Revere Cat. No. 3550-R with 2-No. 3166 Top Floods
L-7	300	Flat Base	51'-6"	Equal to Revere Narrow Beam, plain lens, Cat. No. 5057-NP



DETAIL WALKWAY LIGHTS

Scale: 1/2"=1'-0"

PRODUCER STATIONS 3A & 3B

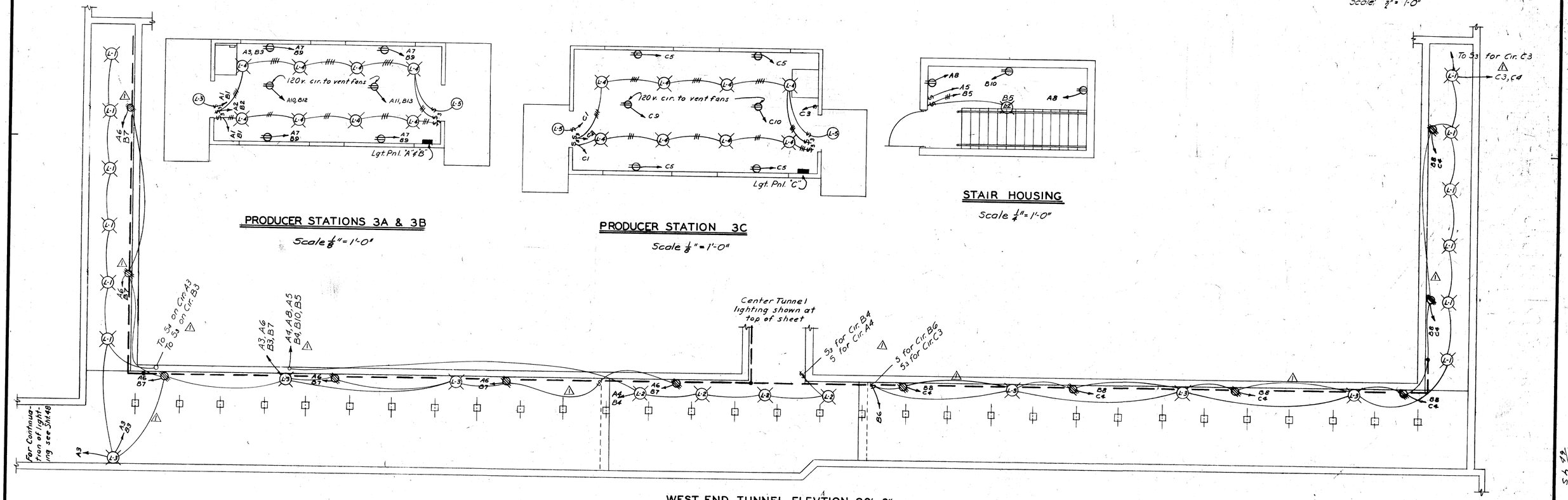
Scale 1/8"=1'-0"

PRODUCER STATION 3C

Scale 1/8"=1'-0"

STAIR HOUSING

Scale 1/4"=1'-0"



WEST END TUNNEL ELEVTION 20'-6"

Scale: 1/8"=1'-0"

NO.	DATE	BY	REVISION
1	1-3-57	F.L.	As Built

GLENN E. HANDS — REGISTERED STATE OF MISSOURI PROFESSIONAL ENGINEER — NUMBER E-2317

AS BUILT

CONTRACT C-125
FINAL BASIN NO. 3
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.
BASIN LIGHTING

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

DESIGNED	HRP	TRACED	HW
DETAILED	HRP	CHECKED	GEH

JOB NO. 52-34D

1955

SCALE: AS SHOWN

SHEET -REV

MICROFILMED

S4 4B 49
572-D314

CITY OF

KANSAS CITY MISSOURI

WATER DEPARTMENT

RECARBONATION FACILITIES - CONTRACT C-109

1953

INDEX OF CONTRACT DRAWINGS

DRAWING NUMBER	DESIGNATION
1	GENERAL LAYOUT
2	TEMPORARY RELOCATION EXISTING FACILITIES
3	PRODUCER BUILDING - ARCHITECTURE DETAILS
4	CO_2 BASIN 1-A - FLOOR REINFORCING
5	CO_2 BASIN 1-B - FLOOR REINFORCING
6	PRODUCER BUILDING & BASIN 2-A - FLOOR REINFORCING
7	CO_2 BASINS 2-A AND 2-B - FLOOR REINFORCING
8	CO_2 BASIN 2-B - FLOOR REINFORCING
9	NORTH WALL REINFORCING (NO. 1)
10	NORTH WALL REINFORCING (NO. 2)
11	CENTER WALL REINFORCING (NO. 1)
12	CENTER WALL REINFORCING (NO. 2)
13	SOUTH WALL REINFORCING (NO. 1)
14	SOUTH WALL REINFORCING (NO. 2)
15	PIPING DIAGRAMS (NO. 1)
16	PIPING DIAGRAMS (NO. 2)
17	PIPING IN TUNNEL
18	DRAINAGE PIPING
19	CO_2 PIPING
20	ELEVATION - CO_2 PIPING
21	CO_2 & AIR PIPING PRODUCER BUILDING
22	DIFFUSER WATER & FUEL OIL SYSTEMS
23	PIPING DETAILS - MISCELLANEOUS SECTIONS
24	WIRING SCHEDULE & ONE-LINE DIAGRAM
25	ELECTRICAL CIRCUIT LAYOUT - SHEET 1
26	ELECTRICAL CIRCUIT LAYOUT - SHEET 2
27	ELECTRICAL CIRCUIT LAYOUT - SHEET 3
28	MISCELLANEOUS DETAILS
29	MISCELLANEOUS DETAILS

BURNS & McDONNELL ENGINEERING COMPANY
KANSAS CITY CLEVELAND

AS BUILT

MICROFILMED
5670-031A 54 1/30

NEW OIL TANKS

filling lines

MIXING BASINS

SECONDARY SETTLING BASINS

SLUDGE

PUMP

HOUSES

CHEMICAL BUILDING

Existing 12"x12"x12" Tee 12"x8" Red 8" G.V.

Located off of Sludge House Walk

New Stop Log

Existing Stop Logs

New Stop Logs

Existing Stop Log

Stop Plank

Exist. 12" Transite CO_2 Line

Exist 12" Water Line

CO_2 BASIN 1-A

CO_2 BASIN 1-B

PRODUCER BUILDING

CO_2 BASIN 2-A

CO_2 BASIN 2-B

8" Blow Off Valve

Existing Gas Main

Top of Existing 4"

⚠ New

1-90° El.
2-45° Els.
12" Pipe To Suit

Exist. 12" Water Line

5'-0"

FINAL SETTLING BASINS

20'-0" 20'-0"

5" Diffuser Line

12" Transite CO_2 Line

BASIN 3

BASIN 4

PRIMARY SETTLING

BASIN 1

BASIN 2

STORE ROOM

SUB-STATION

FILTER BUILDING

N E S W

PLANT DATUM

ELEVATION

	NO. 2	NO. 3	NO. 4	NO. 5	NO. 6
40'	EL. 35.8' 0'-0"	EL. 36.0' 0'-0"	EL. 36.0' 0'-0"	EL. 35.9' 0'-0"	EL. 35.5' 0'-0"
30	FINE 23 W.L.	FINE W.L.	FINE W.L.	FINE W.L.	FINE 10 W.L.
	SAND 13	SAND 19 10'-6"	SAND 10 14'-0"	SAND 9 16'-0"	SAND 13
20	SILTY CLAY 6 18'-4"	CLAY 6 HIT CONC. 17'-0"	SILTY CLAY 5 18'-6"		HIT CONC. 18 17'-0"
	13'-6"		CLAY 10 8 28'-6"	CLAY 10 13	
10			FINE SAND 23 30'-0"	FINE SAND 12 29'-6"	27'-6"
00					

NOTE: SEE SHEET NO. 2 FOR LOCATION OF TEST BORINGS

AS BUILT

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.
General Layout
BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI
1953

NO.	DATE	REVISIONS	BY
3	9-27-55	As Built Corrections	VDV
2	8-11-54	Relocated 12" Water Line	DFS
1			

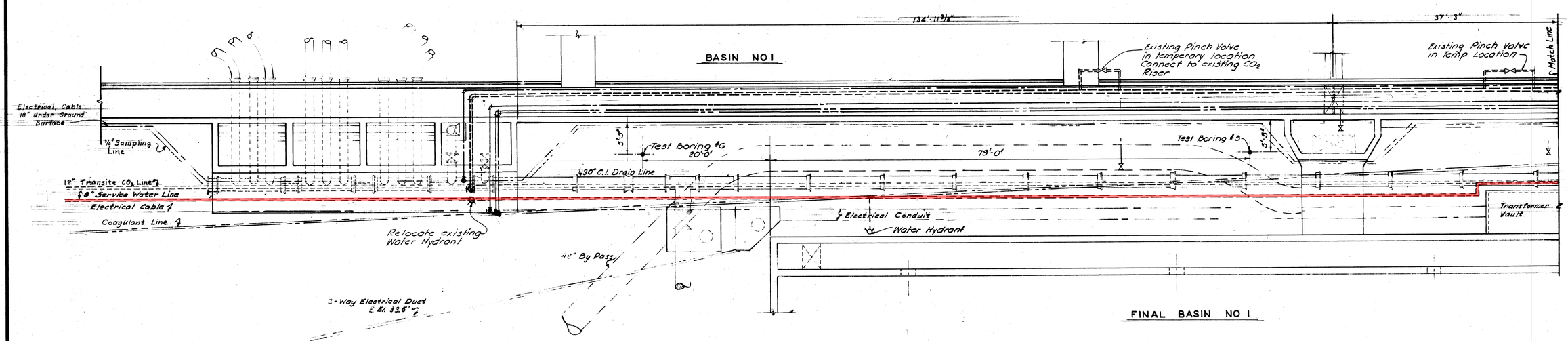
DESIGNED
DETAILED RDF
CHECKED
APPROVED G.E.H.

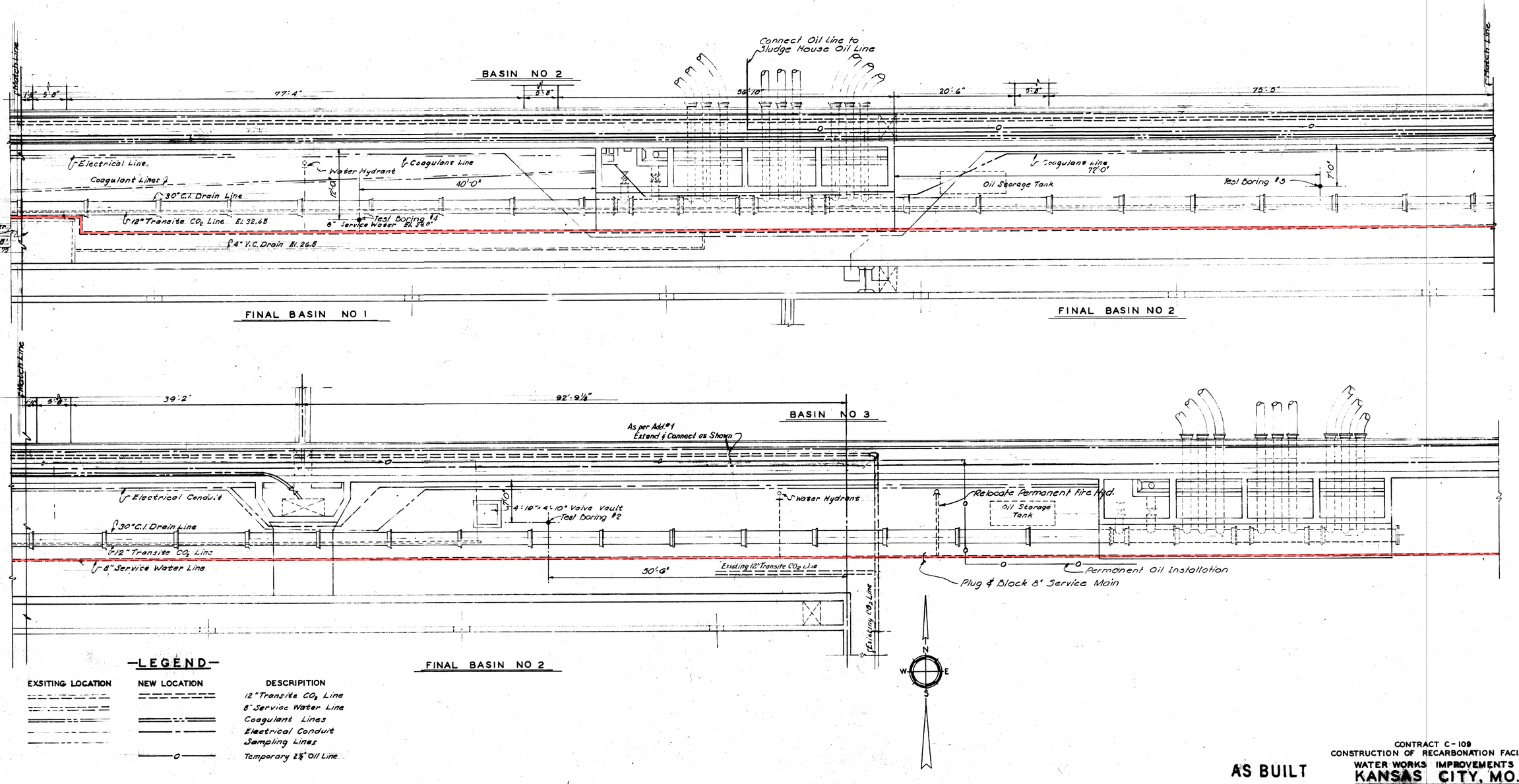
JOB NO. 52-34D

SCALE : 1" = 40'

SHEET NO. 30

D 31 A 54 30





—LEGEND—

EXSITING LOCATION	NEW LOCATION	DESCRIPTION
		12" Transite CO_2 Line
		8" Service Water Line
		Coagulant Lines
		Electrical Conduit
		Sampling Lines
	—o—	Temporary 2½" Oil Line

AS BUILT

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
3			
2			
1	9-29-65	As Built Corrections	JBA

DESIGNED
DETAILED QDG
CHECKED
APPROVED

JOB NO. 52-34D

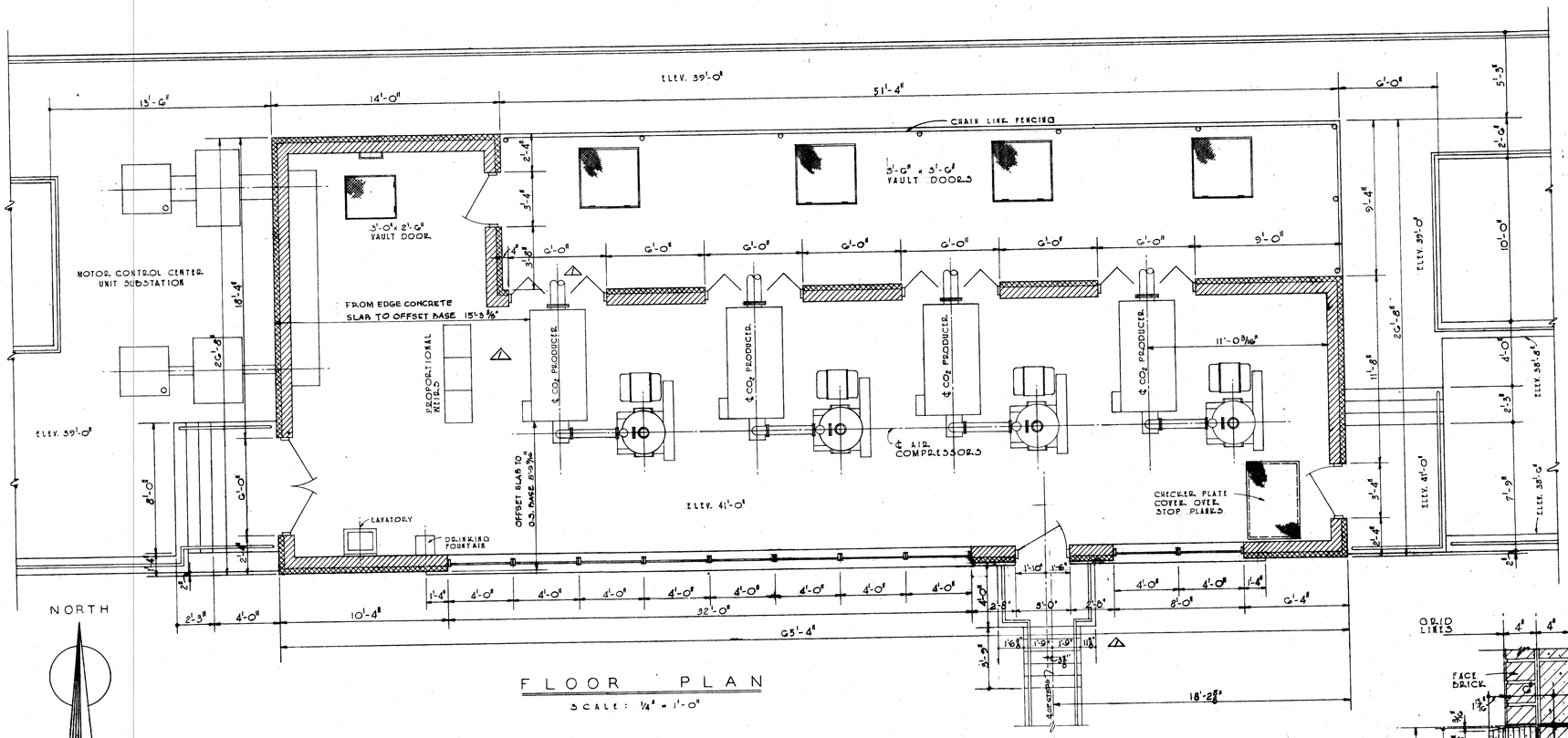
1953

SCALE : 1/8" = 1'-0"

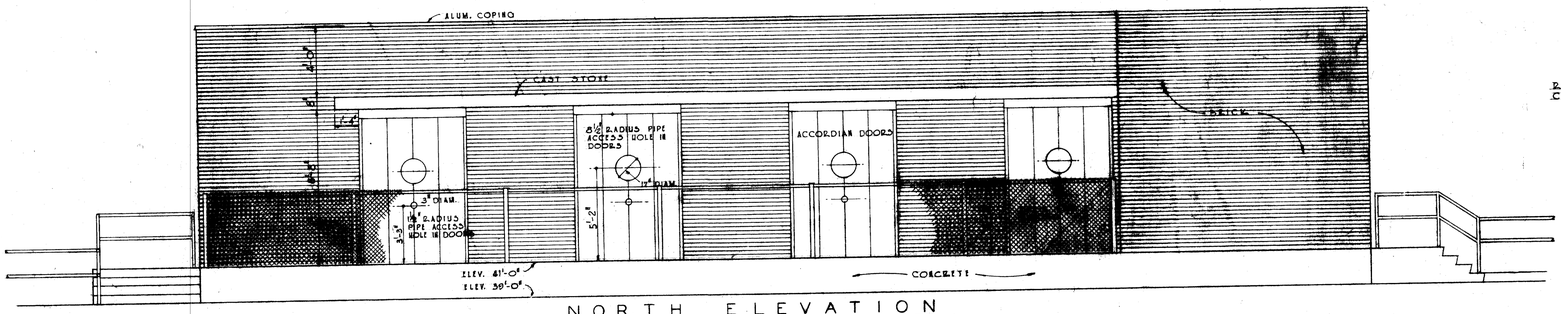
SHEET - REV 2

070-D31A SH 2 of 2

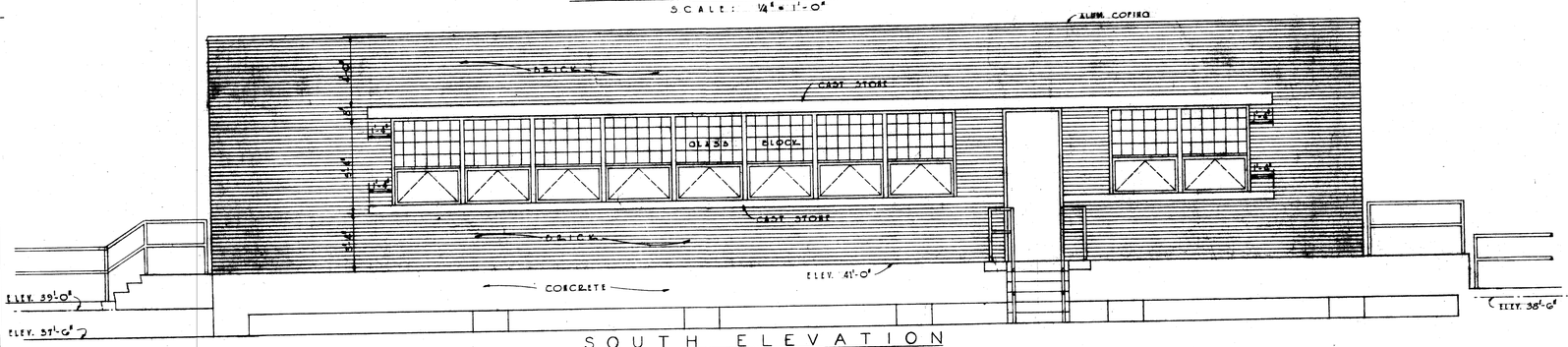
NOTE:
ALL DIMENSIONS ON THIS SHEET ARE MODULAR.
ARROWHEADS ⟶ TO GRID LINE DIMENSIONS
DOT POINTS ⟶ TO NON-GRID DIMENSIONS



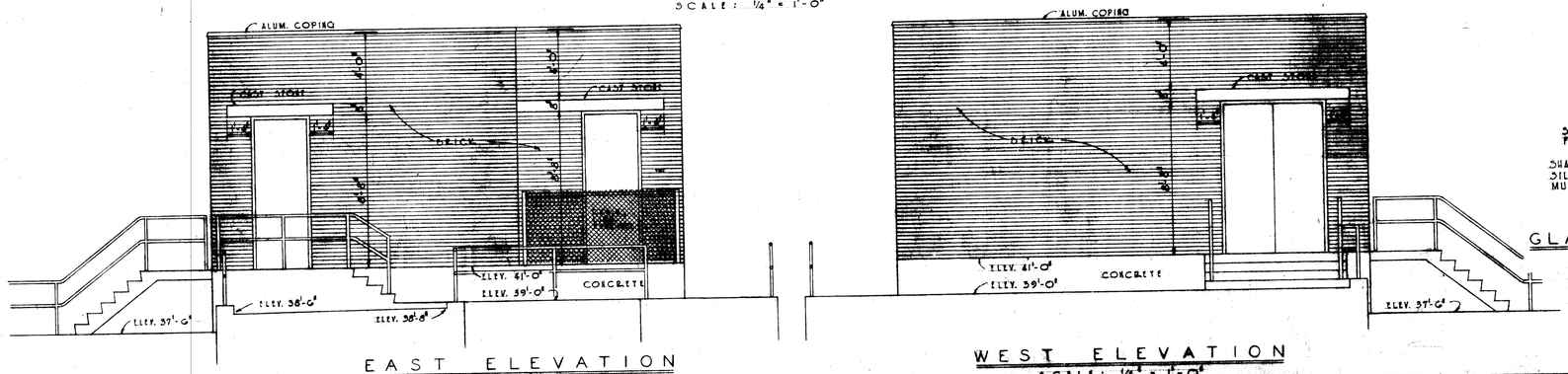
FLOOR PLAN
SCALE: 1/4" = 1'-0"



NORTH ELEVATION
SCALE: 1/4" = 1'-0"

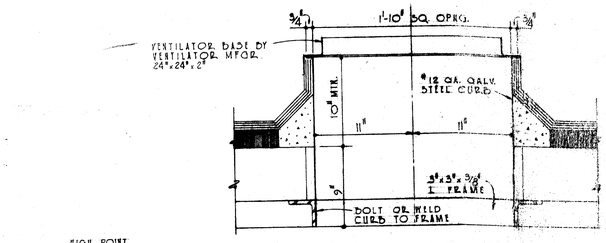


SOUTH ELEVATION
SCALE: 1/4" = 1'-0"

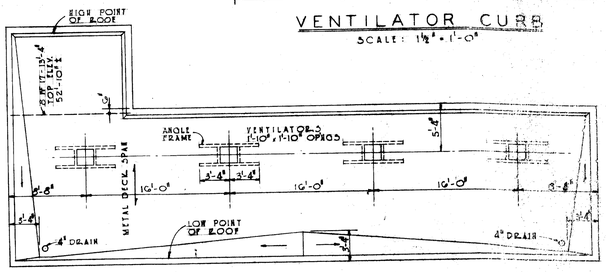


EAST ELEVATION
SCALE: 1/4" = 1'-0"

WEST ELEVATION
SCALE: 1/4" = 1'-0"

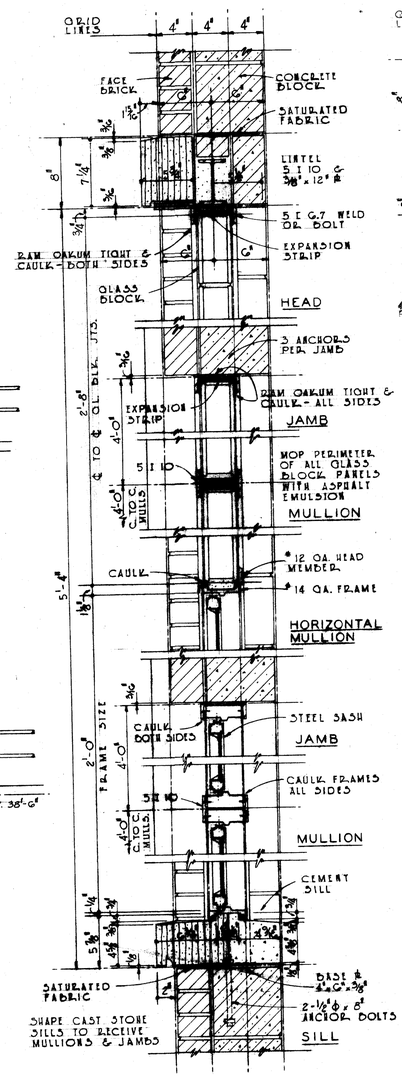


VENTILATOR CURB
SCALE: 1½" = 1'-0"

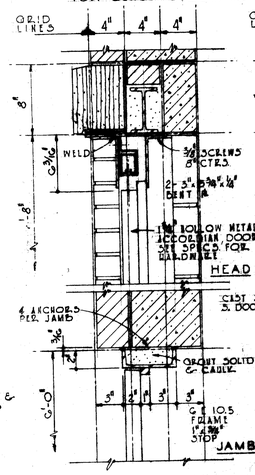


ROOF PLAN
SCALE: 1/8" = 1'-0"

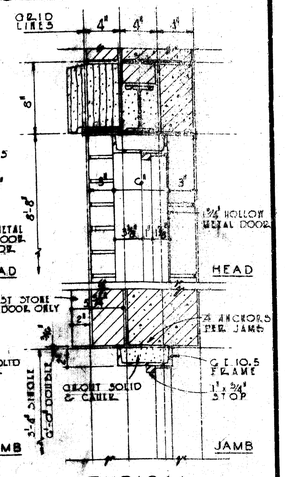
CAST STONE TRIM AT HEADS OF ALL WALL OPENINGS TO BE AS DETAILED FOR GLASS BLOCK & SASH



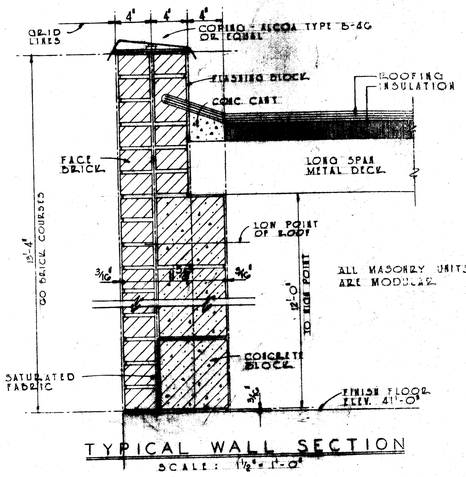
GLASS BLOCK & SASH DETAIL
SCALE: 1½" = 1'-0"



ACCORDIAN DOOR DETAIL
SCALE: 1½" = 1'-0"



TYPICAL DOOR DETAIL
SCALE: 1½" = 1'-0"



TYPICAL WALL SECTION
SCALE: 1½" = 1'-0"

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

AS BUILT

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
1	6-25-53	As Built Corrections	JRH

DESIGNED J.R.B. CHECKED J.R.B.
DETAILED J.R.B. APPROVED G.E.H.

JOB NO. 52-340 1953

SCALE 1" = AS NOTED

SHEET -REV 3 -

670-031A Sh #30

MICROFILMED

SECONDARY BASIN NO.1

RECARBONATION BASIN NO.1-A

FINAL BASIN NO.1

Existing Drainage Chamber

Elev. 39'-0"

Elev. 27'-0"

Elev. 36'-0"

Elev. 38'-6"

Elev. 39'-1"

Elev. 21'-0"

Elev. 23'-0"

Elev. 39'-0"

Elev. 38'-6"

2'-4"x4'-10" 1/4" Grating

2'-0"x4'-6" Ophg Cut In Ex. Flume

6"x6"x12" Beam Slots

3' Stop Logs

18"x1/2" Grating Over Exist. MH.

Neenah R-6660J Or Equal

Exist. Electrical Manhole To Be Removed. Existing Duct Bank To Remain To Inside Face Of Wall. See Electrical Details Sh.#26.

Stop Curb at This Point #Add 3 Trs @ 10"℄ & D.I.'s @ 7½"

Remove 6 Operators & Conc. Platforms.

Existing Const. Jt.

16'-0" New Section

PLAN AT ELEV. 39'-0"

New Stop Logs See Detail Sh.8

Add 2 #5 x 5'-0" @ 6" T.C.C. Alt With Long Bars

Existing Valve MH Remove To Elev. 25'-6"±

#5 @ 10" T.C.C.

14" Grating

Cut 12 New 30" Sq. Openings

Close Or Remove 6 Exist. Gates As Shown.

See Plan @ El. 21'-0" Sh. #9

Constr. Jt.

Expose Existing Steps 2'-0" For Ladder See Section D-14 For Steps.

Exist. Flume & Wall Removed

PLAN AT ELEV. 27'-0"

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
3			
2			
1	9-27-68	As Built Corrections	JDJ

DESIGNED LDB CHECKED LDB
DETAILED RDF APPROVED GEH

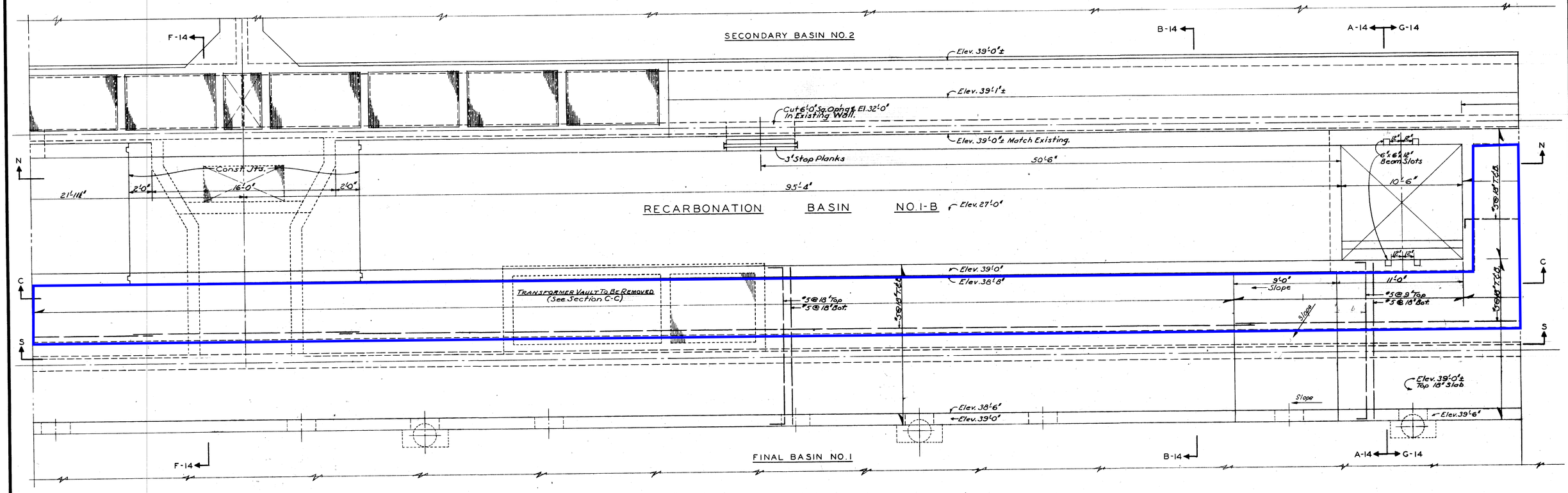
JOB NO. 52-34D

1953

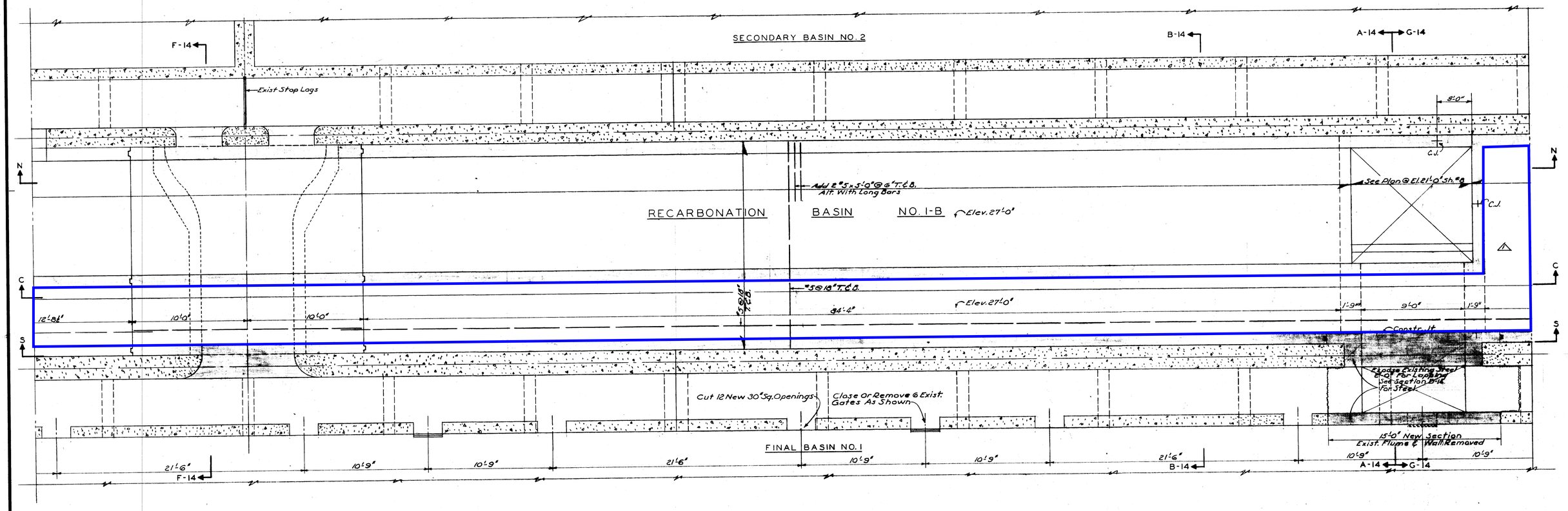
SCALE : 1/4" = 1'-0"

SHEET NO. 4

MICROFILMED



PLAN AT ELEV. 39'-0"



PLAN AT ELEV. 27'-0"

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.
As Built 1-B - Slope Reinforcing
BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

AS BUILT

NO.	DATE	REVISIONS	BY
1	9-21-55	As Built Corrections	J.R.J.

DESIGNED L D B | CHECKED L D B
DETAILED R D F | APPROVED G E H

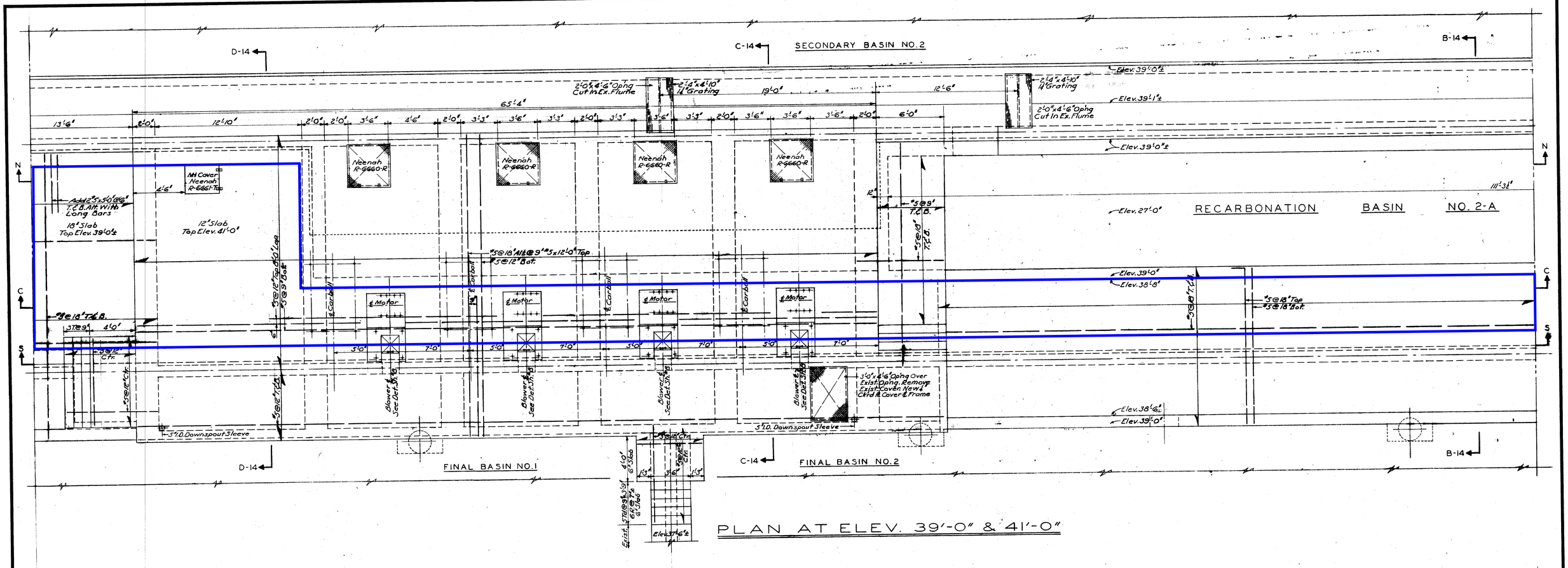
JOB NO. 52-34D

1953

SCALE : 1/4"=1'-0"

SHEET NO. 5

MICROFILMED



CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.
Producer Building & Basin B-6 - Steps Beginning

AS BUILT

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
1			
2			
3	6-27-53	As Built Corrections	J.D.J.

DESIGNED L D B | CHECKED L D B
DETAILED R D F | APPROVED G E H

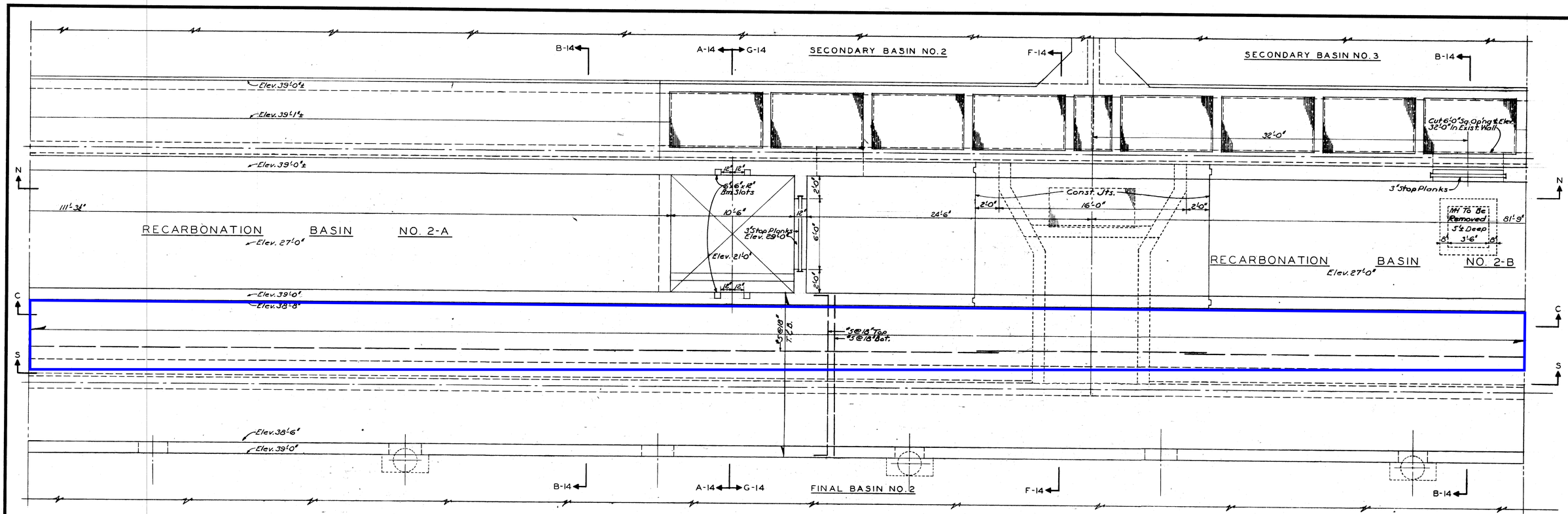
JOB NO. 52-34D

1953

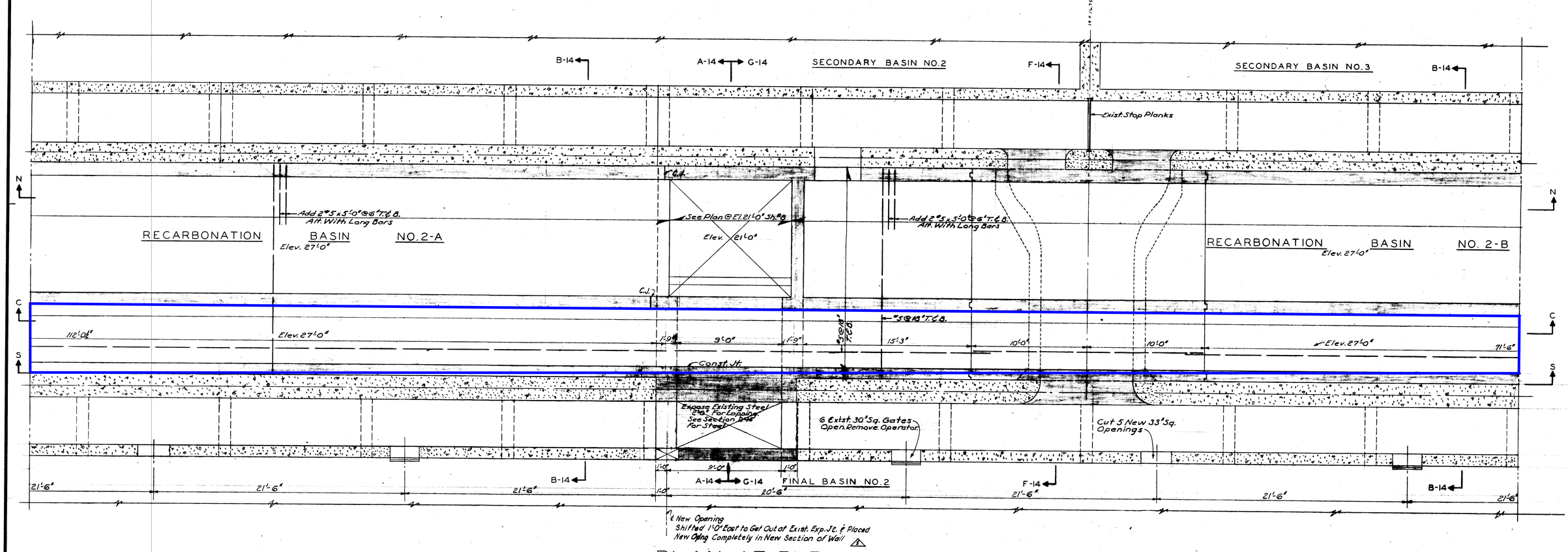
SCALE : .146"= 1'-0"

SHEET 6

570-D31A Sh 30



PLAN AT ELEV. 39'-0"



PLAN AT ELEV. 27'-0"

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
KANSAS CITY, MO.

AS BUILT

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

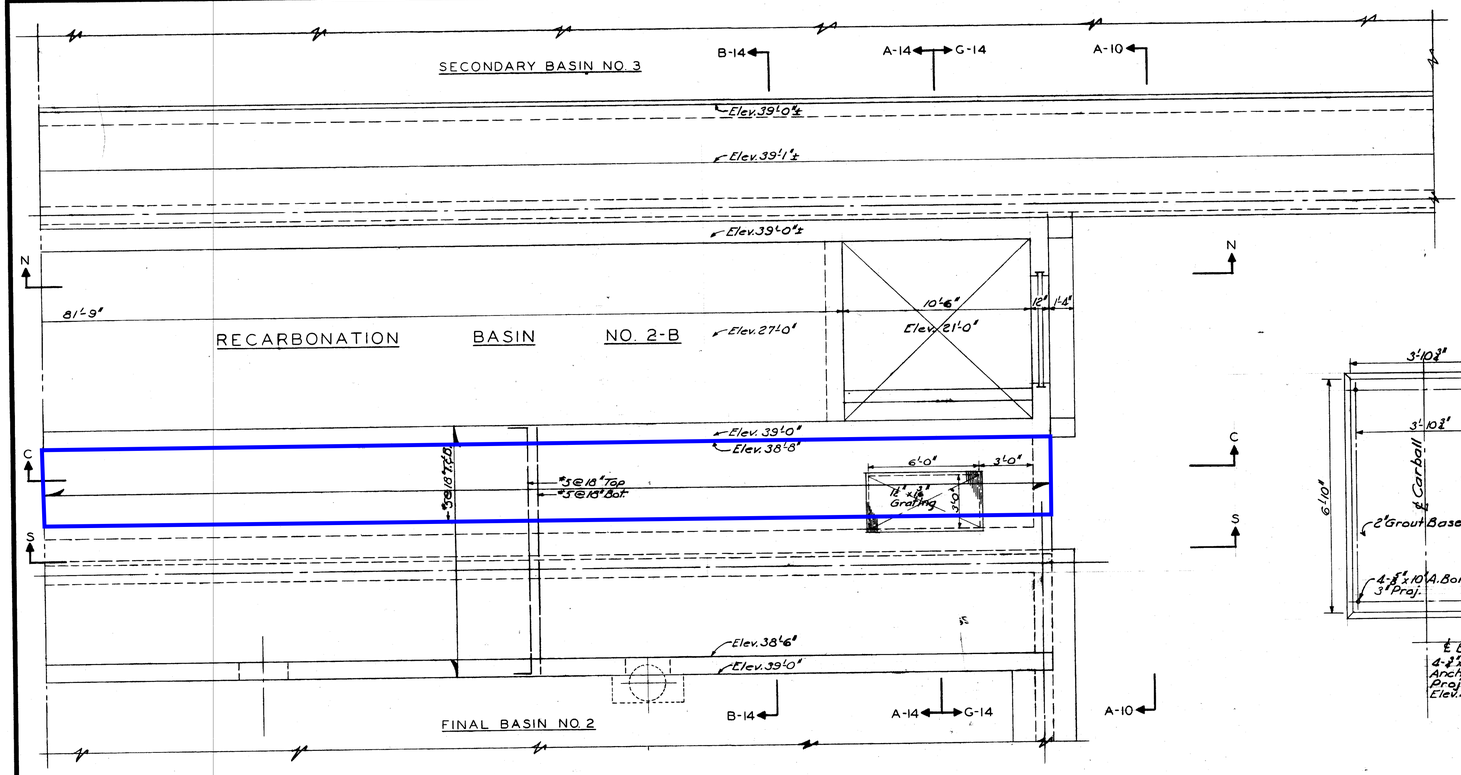
NO.	DATE	REVISIONS	BY
1			
2			
3	9-27-55	As Built Corrections	W.D.M.

DESIGNED L.D.B. CHECKED L.D.B.
DETAILED R.D.F. APPROVED G.E.H.

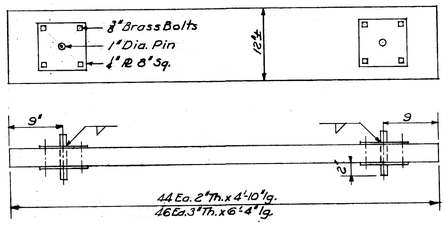
JOB NO. 52-34D
1953
SCALE : 1/4"=1'-0"
SHEET NO. 7-

13+79.75

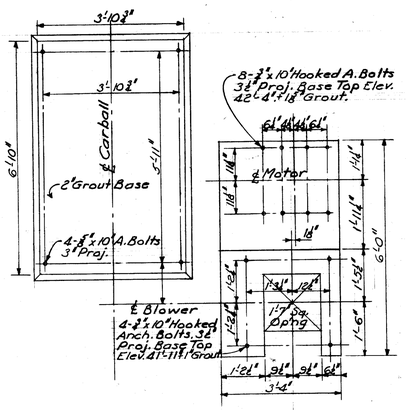
MICROFILMED



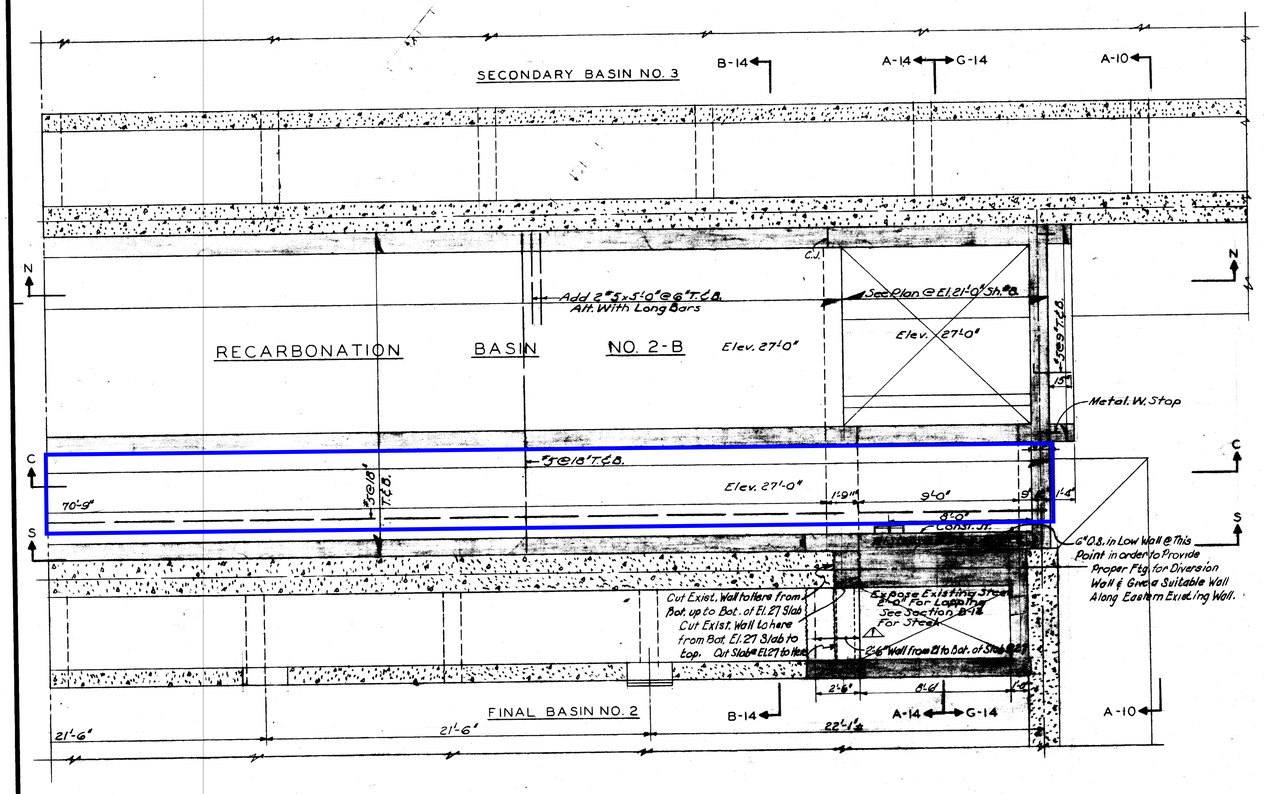
PLAN AT ELEV. 39'-0"



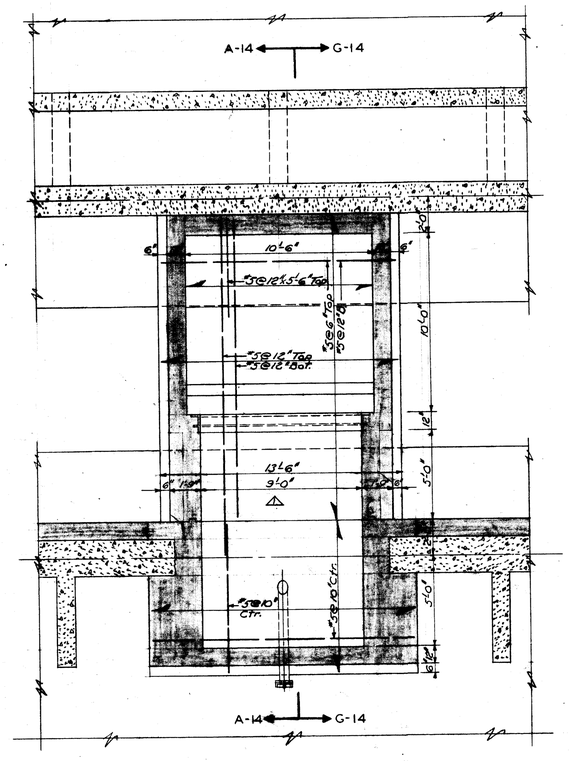
STOP PLANK DETAILS



CARBALL BASE DETAILS
Scale 1" = 1'-0"



PLAN AT ELEV. 27'-0"



PLAN AT ELEV. 21'-0"
Typical Reinf. - See Section A-14

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

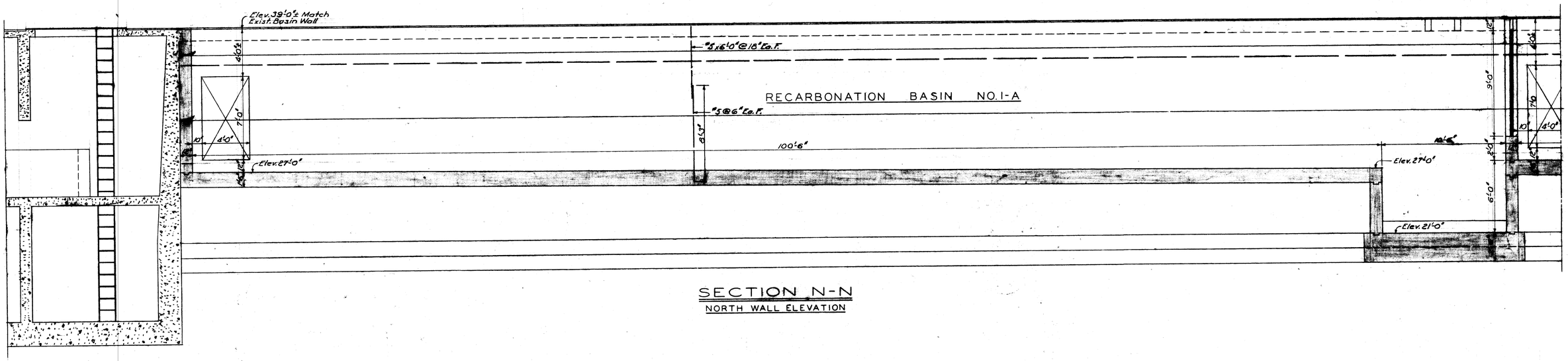
NO.	DATE	REVISIONS	BY
1	9-7-55	As Built Corrections	LDB

DESIGNED L D B | CHECKED L D B
DETAILED R D F | APPROVED G E H

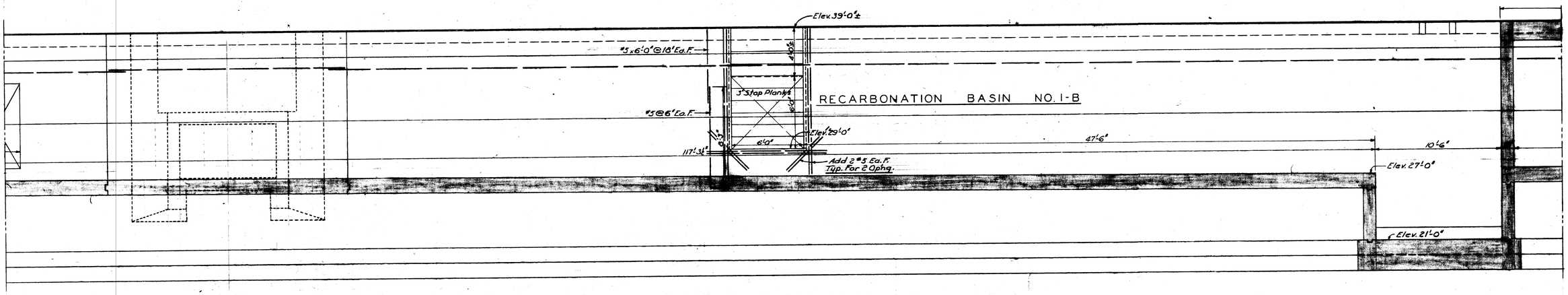
JOB NO. 52-34D
1953
SCALE : 1/4" = 1'-0"
SHEET -REV. 8 -

D-314 5-1-30

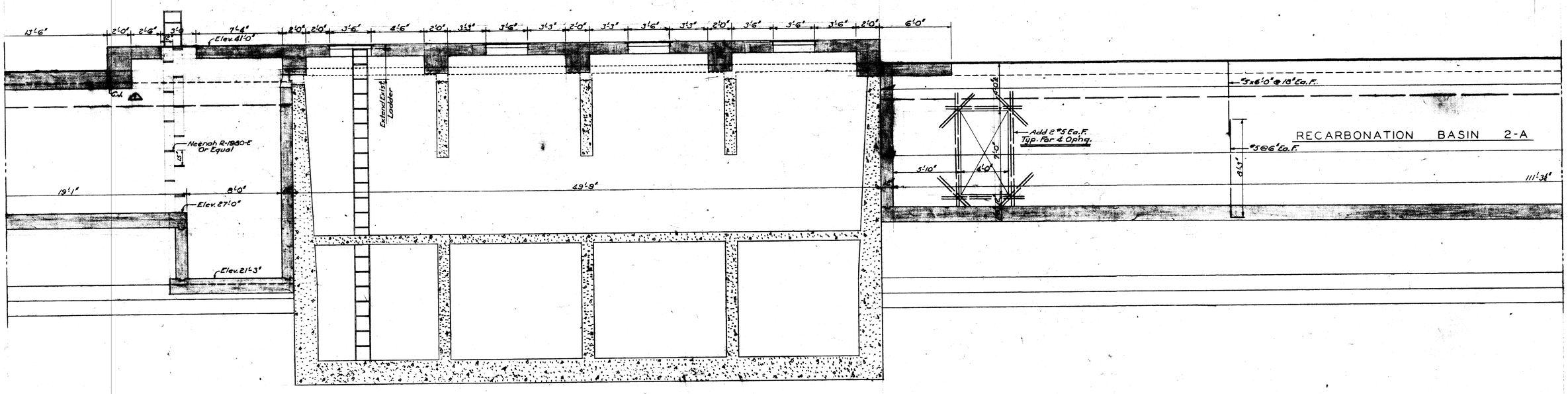
MIDWEST BLUEPRINT CO., INC.



SECTION N-N
NORTH WALL ELEVATION



SECTION N-N
NORTH WALL ELEVATION



SECTION N-N
NORTH WALL ELEVATION

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
3			
2			
1	9-27-55	As Built Corrections	J.D.J.

DESIGNED L.D.B. CHECKED L.D.B.
DETAILED R.D.F. APPROVED G.E.H.

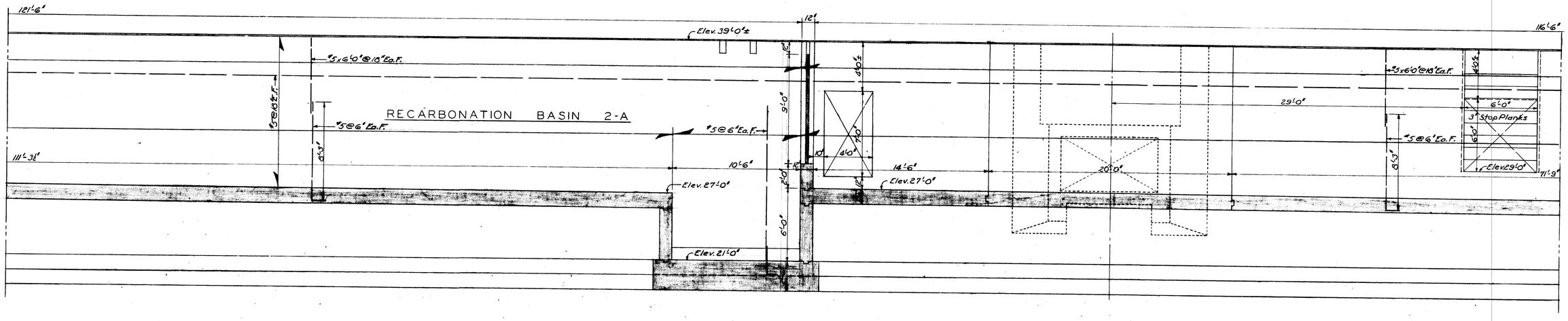
JOB NO. 52-34D

1953

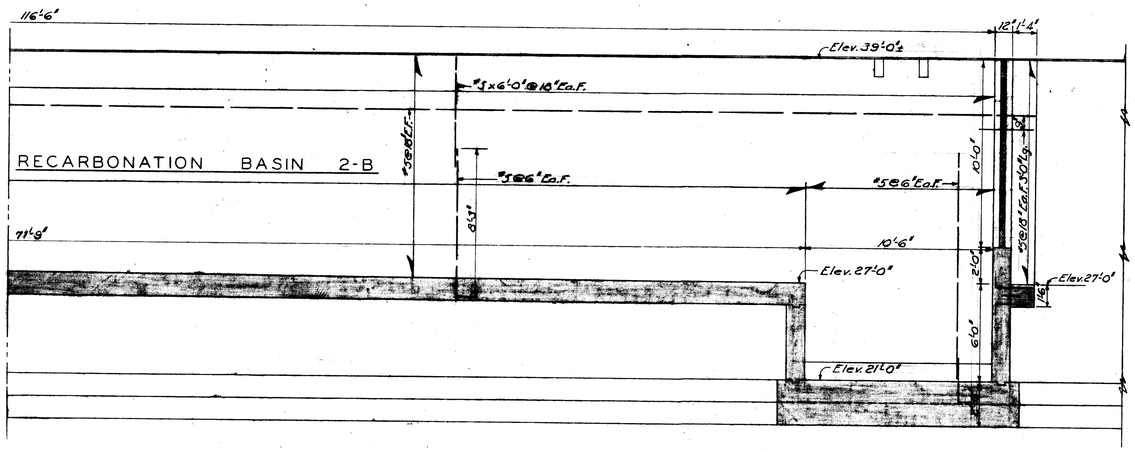
SCALE : 1/4"=1'-0"

SHEET NO. 9

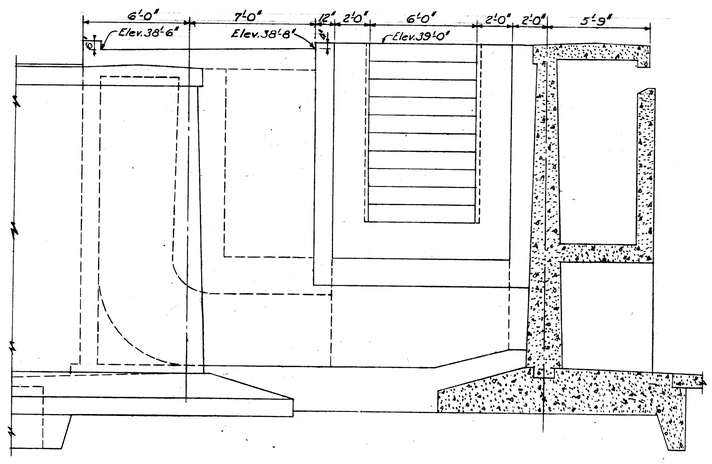
MICROFILMED
10-03/A 54 19/30



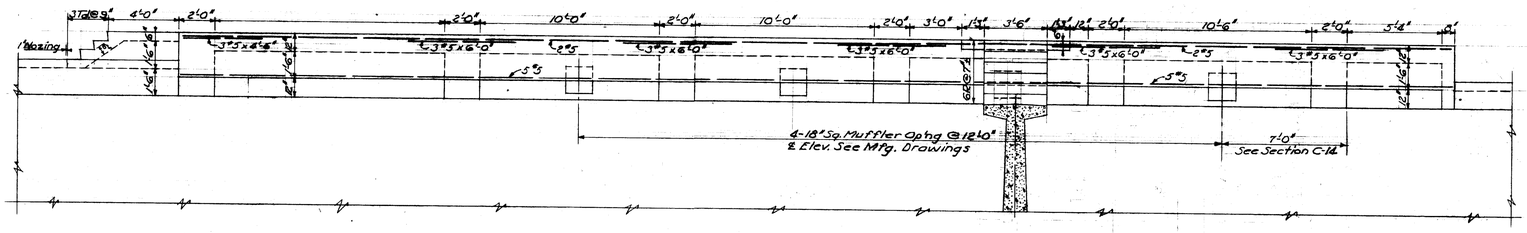
SECTION N-N
NORTH WALL ELEVATION



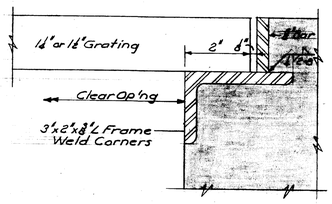
SECTION N-N
NORTH WALL ELEVATION



SECTION A-10



SECTION C-10
See Section C-14



GRATING FRAME DETAIL

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.
[redacted]
BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

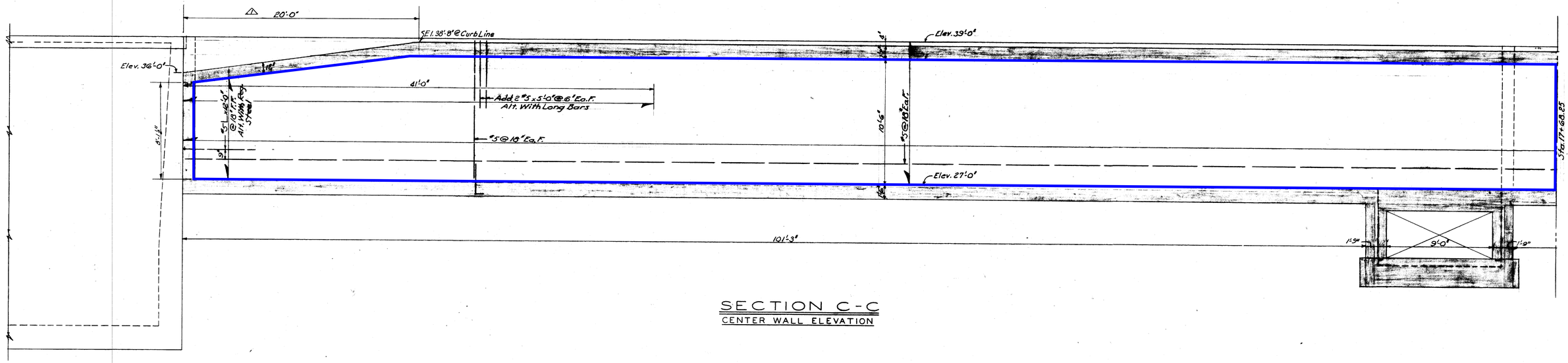
NO.	DATE	REVISIONS	BY
1			
2			
3	2-25-58	As Built Corrections	LDB

DESIGNED	L D B	CHECKED	L D B
DETAILED	R D F	APPROVED	G E H

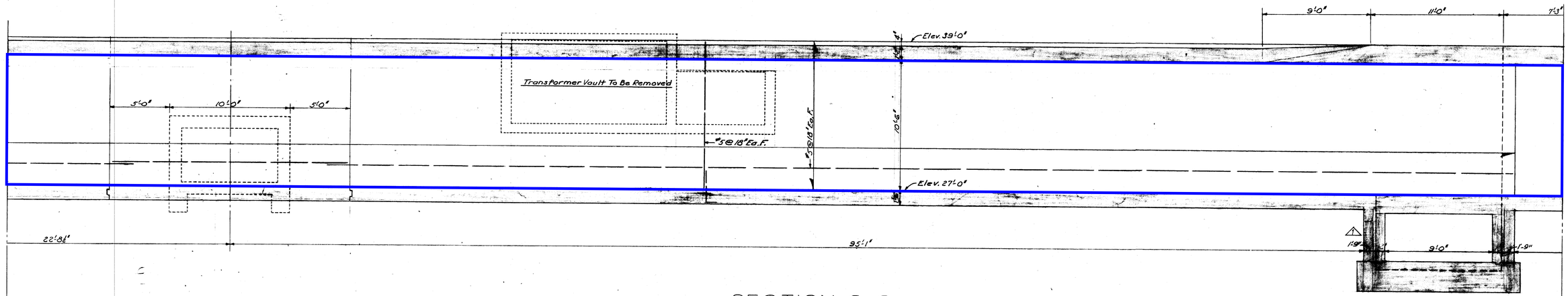
JOB NO. 52-34D
1953
SCALE : 1/4" = 1'-0"
SHEET -REV. 10 -

C10-D31A SH 10

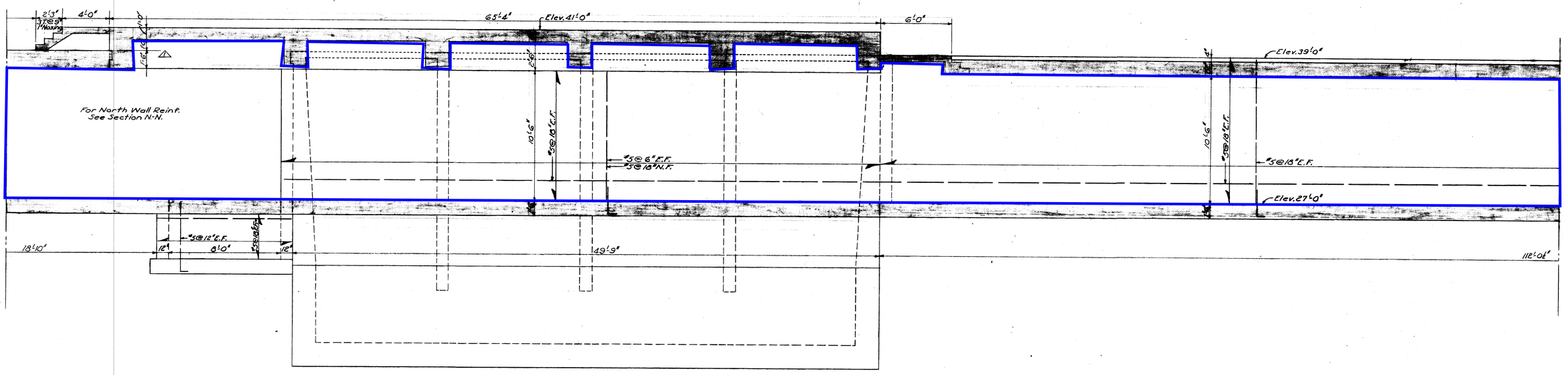
MICROFILMED



SECTION C-C
CENTER WALL ELEVATION



SECTION C-C
CENTER WALL ELEVATION



SECTION C-C
CENTER WALL ELEVATION

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

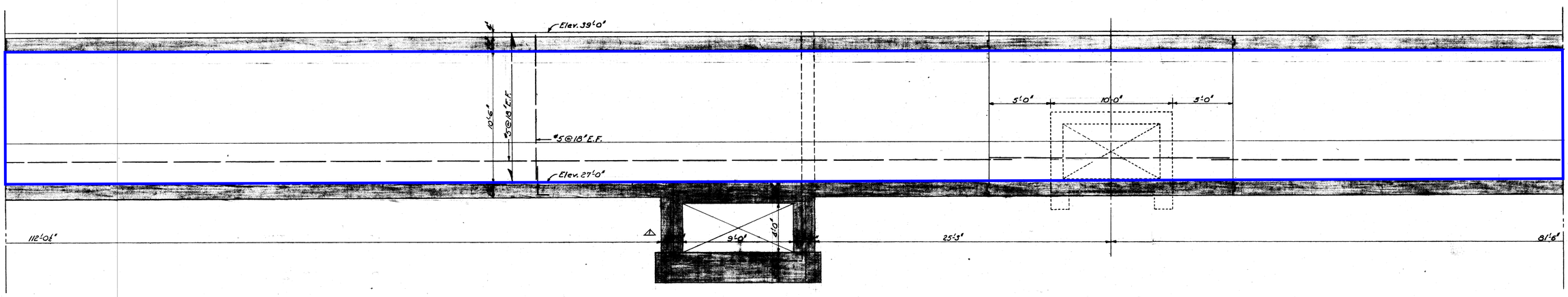
NO.	DATE	REVISIONS	BY
3			
2			
1	6-27-55	As Built Corrections	J.D.J.

		JOB NO.	SHEET - REV.
DESIGNED L D B	CHECKED L D B	52-34D	11 -
DETAILED R D F	APPROVED G E H	1953	

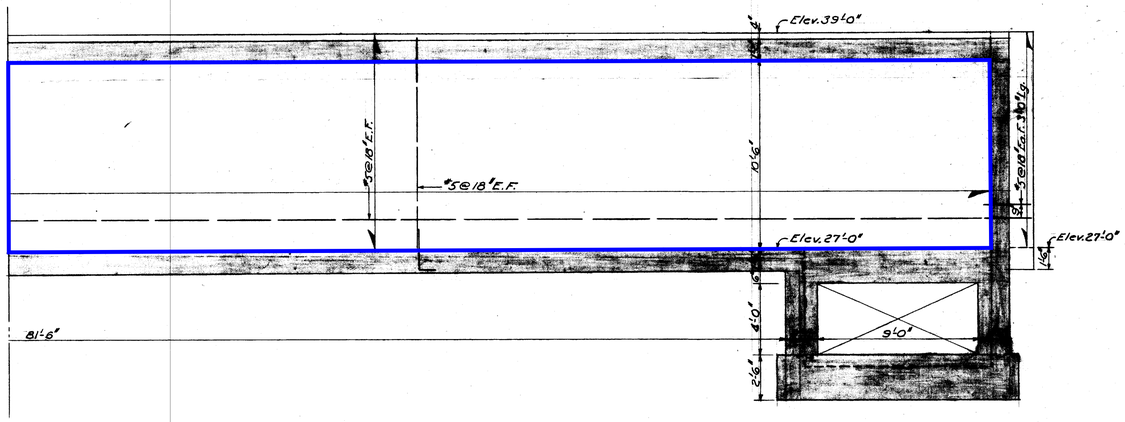
SCALE : 1/4" = 1'-0"

MICROFILMED

340-D-314 Sh 13/30



SECTION C-C
CENTER WALL ELEVATION



SECTION C-C
CENTER WALL ELEVATION

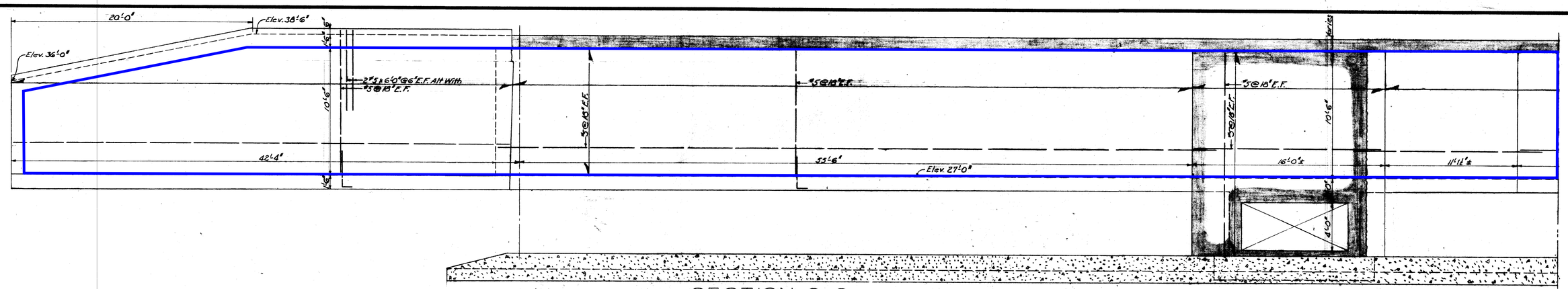
CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

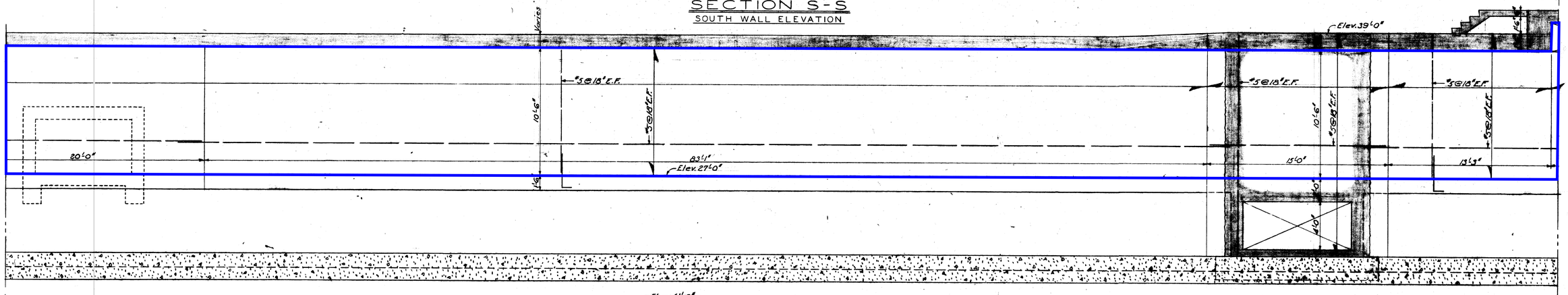
NO.	DATE	REVISIONS	BY
3			
2			
1	8-27-53	As Built Corrections	LDA

DESIGNED	L D B	CHECKED	L D B
DETAILED	R D F	APPROVED	G E H

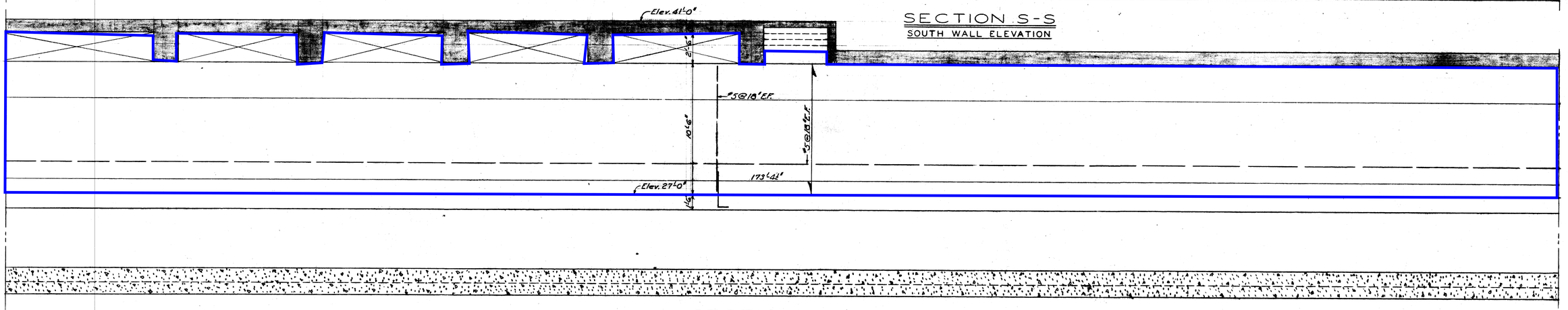
JOB NO. 52-34 D
1953
SCALE : 1/4" = 1'-0"
SHEET - REV. 12-



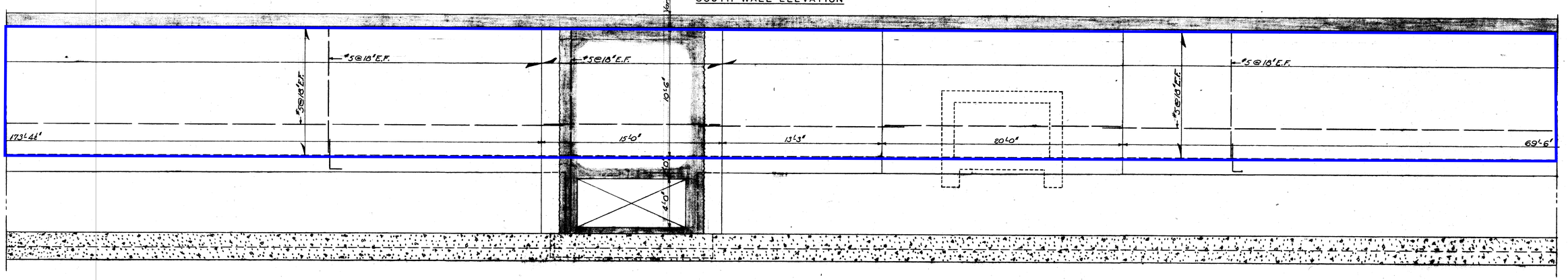
SECTION S-S
SOUTH WALL ELEVATION



SECTION S-S
SOUTH WALL ELEVATION



SECTION S-S
SOUTH WALL ELEVATION



SECTION S-S
SOUTH WALL ELEVATION

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
1	6-27-55	As built Corrections	LBB

DESIGNED LDB CHECKED LBB
DETAILED RDF APPROVED GEH

JOB NO. 52-34D

1953

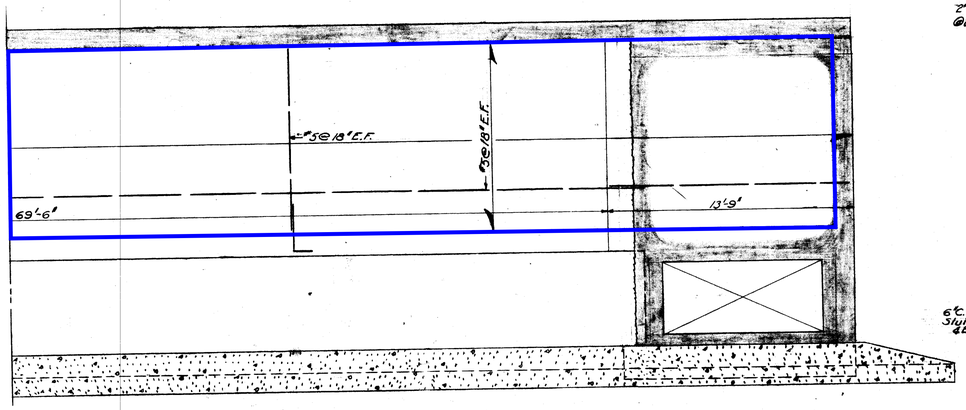
SCALE : 1/4" = 1'-0"

SHEET -REV 13 -

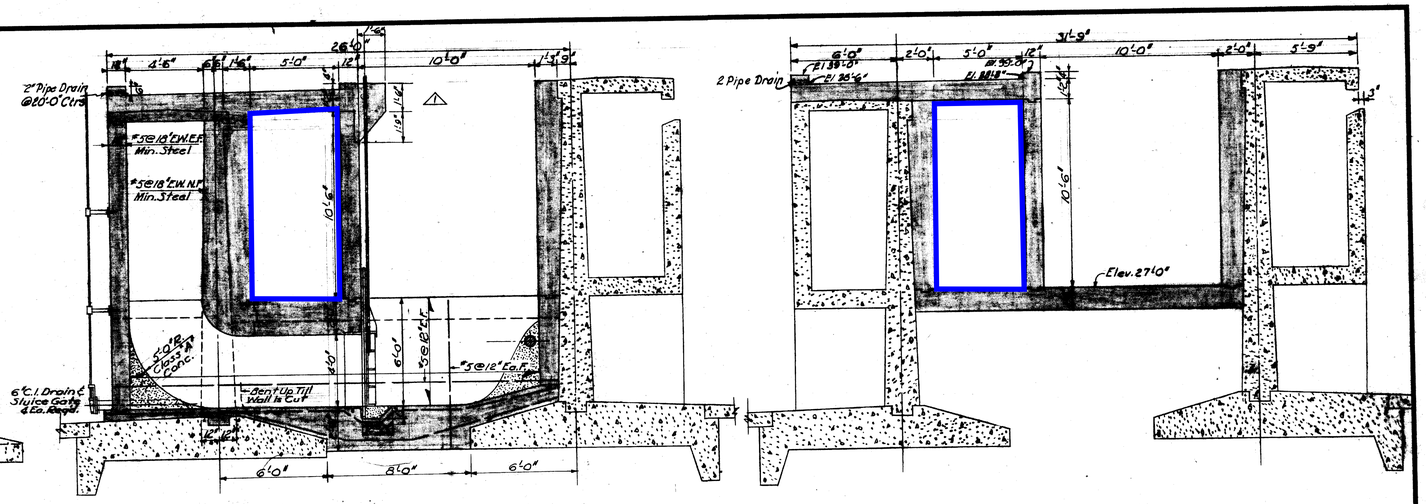
MICROFILMED

OFFICE OF FLAMING, NO

92-34D - 44-

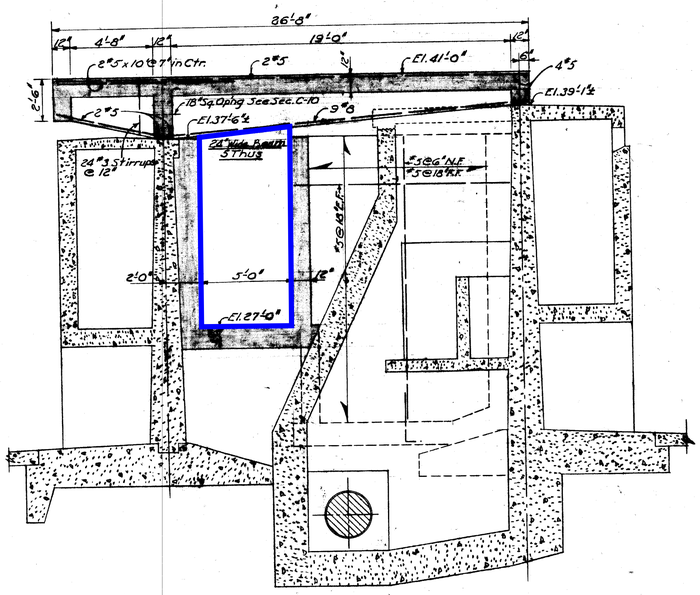


SECTION S-S
SOUTH WALL ELEVATION

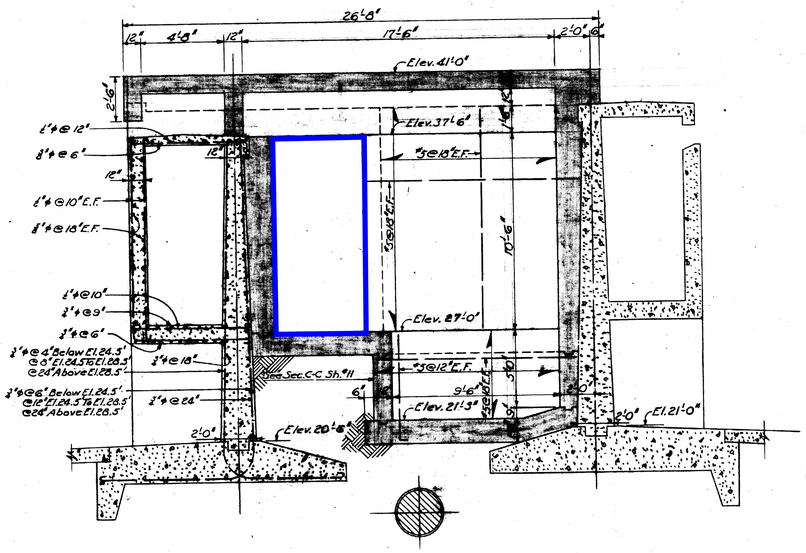


SECTION A-14

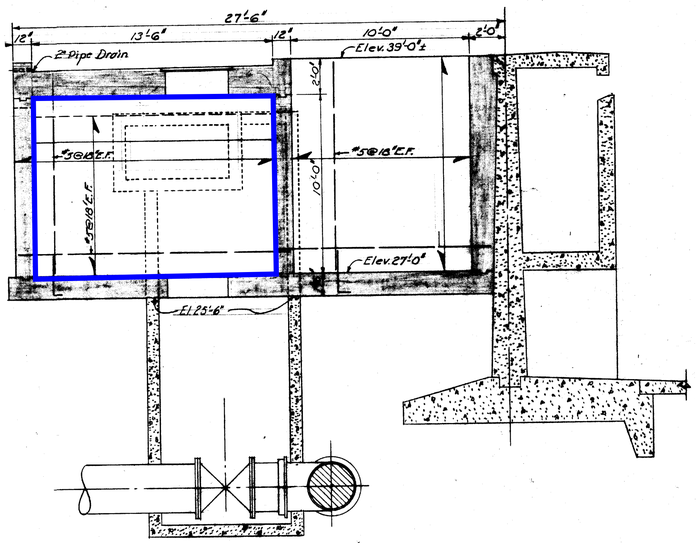
SECTION B-14



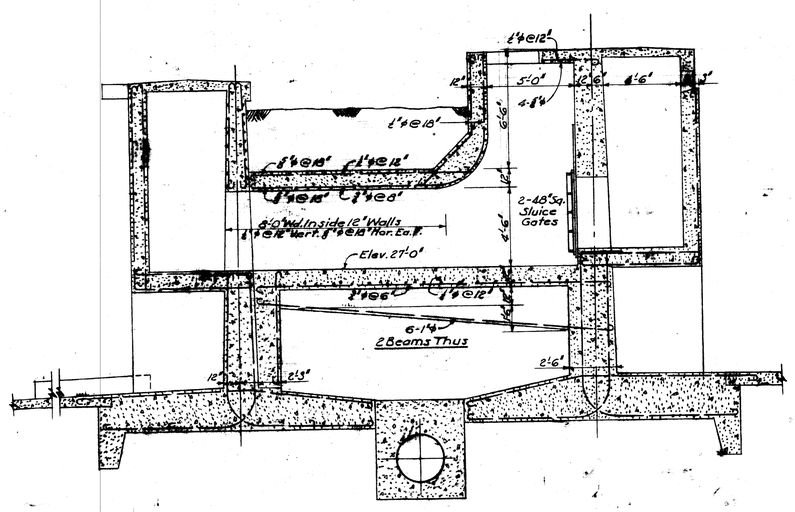
SECTION C-14



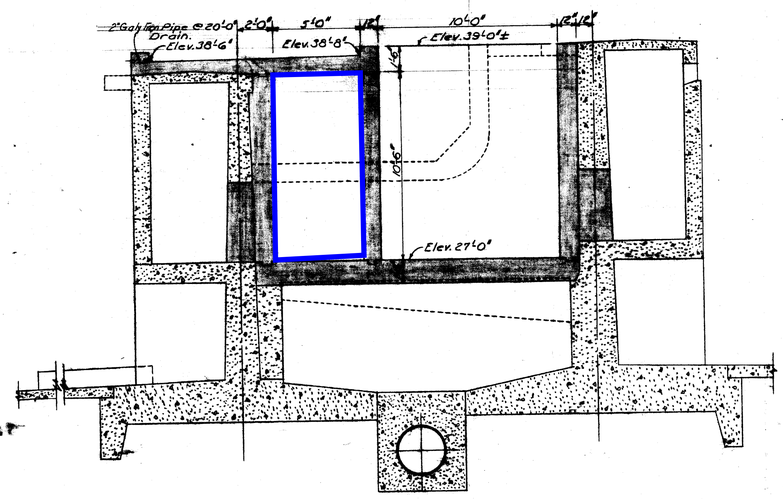
SECTION D-14



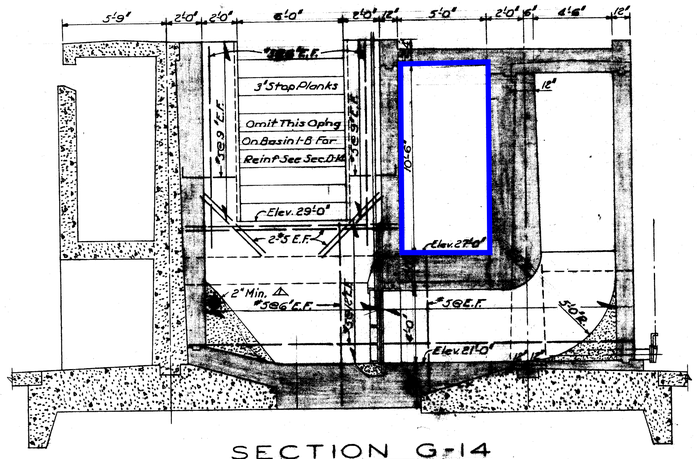
SECTION E-14



SECTION F-14
BEFORE NEW CONSTR.



SECTION F-14



SECTION G-14

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
1	9-2003	As built Corrections	JWH

DESIGNED L D B · CHECKED L D B
DETAILED R D F · APPROVED G E M

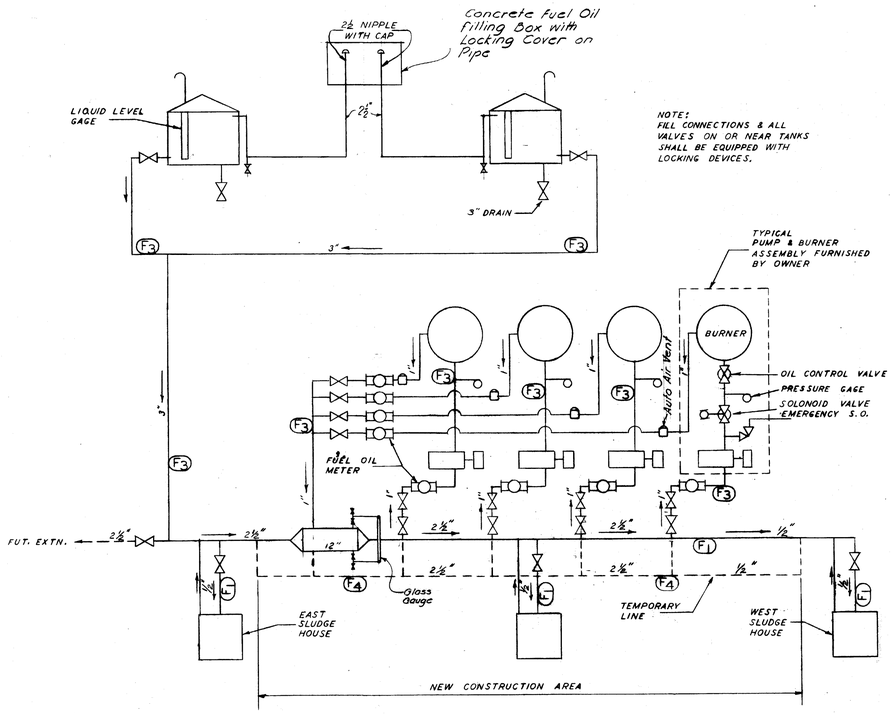
JOB NO. 92-34D

1953

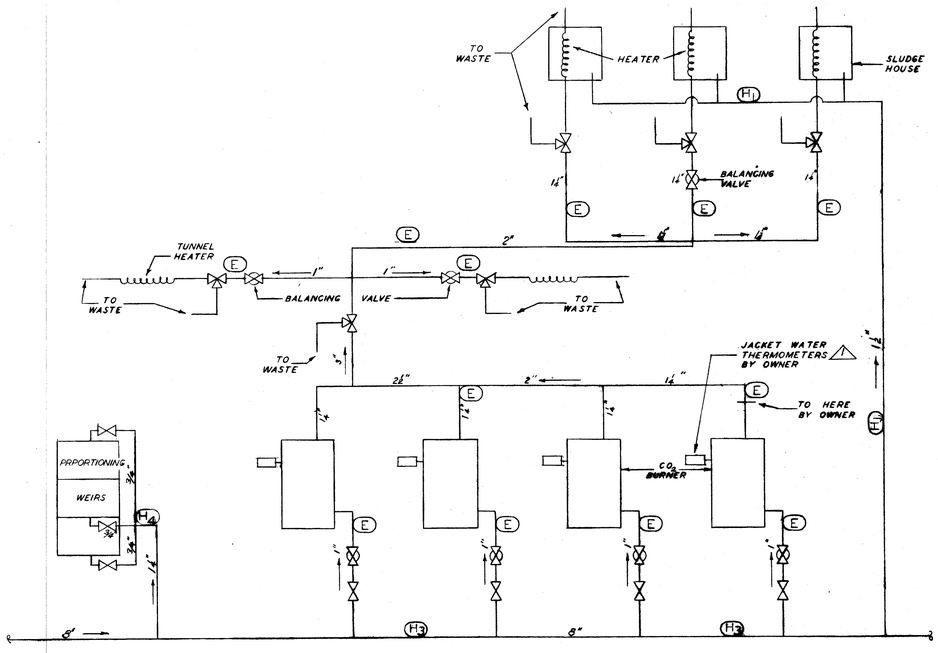
SCALE : 1/8" = 1'-0"

SHEET NO. 14

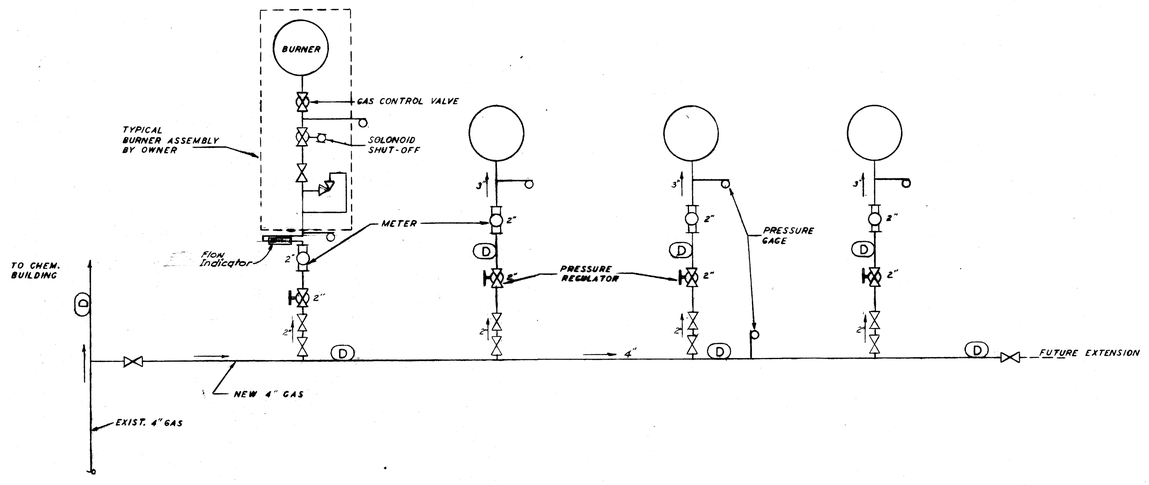
MICROFILM



FUEL OIL SYSTEM - LINES $F_1, F_2, F_3, \& F_4$



SERVICE WATER - LINES $H_1, H_3 \& H_4$
JACKET WATER - LINE E



NATURAL GAS FUEL SYSTEM - LINE D

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.
[redacted]
BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
1			
2			
3	9-24-53	As Built Corrections	JBM

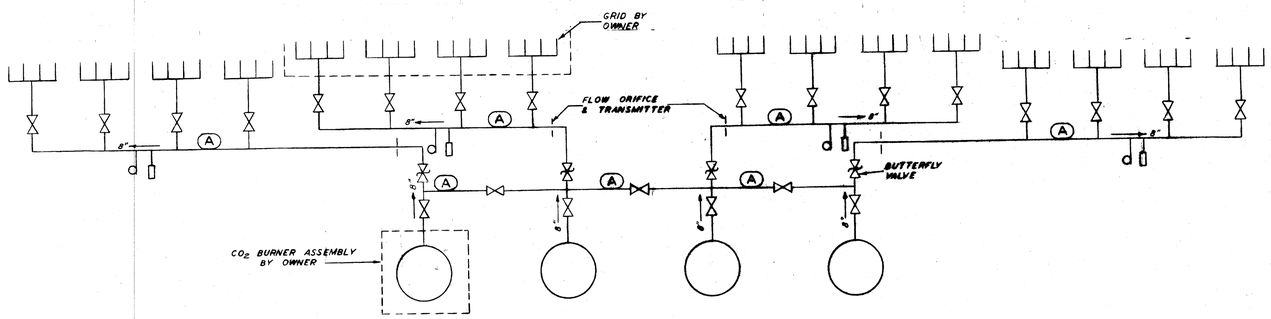
DESIGNED L K S | CHECKED L K S
DETAILED J T S | APPROVED G E H

JOB NO. 52-34D | 1953 | SCALE : NONE | SHEET - REV. 15 -

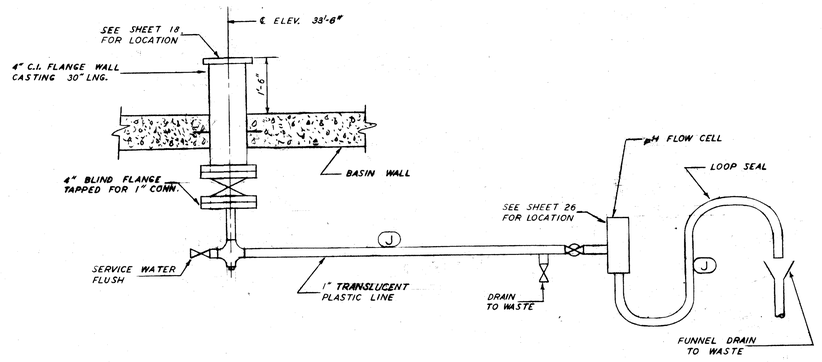
5670-D-31-A SH 16/30

MICROFILMED
23-34D -43-

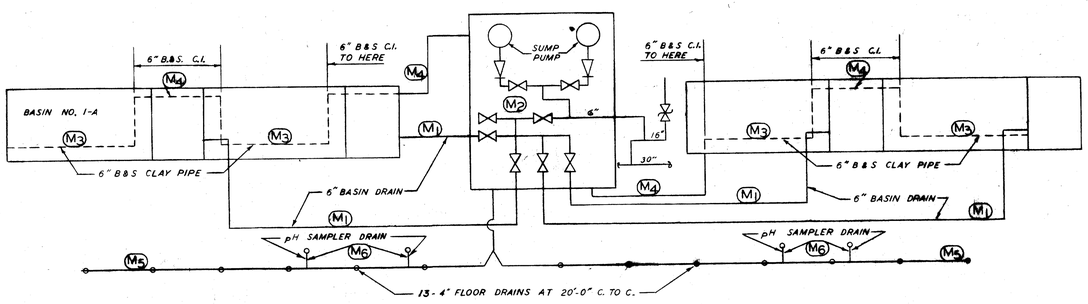
23-310



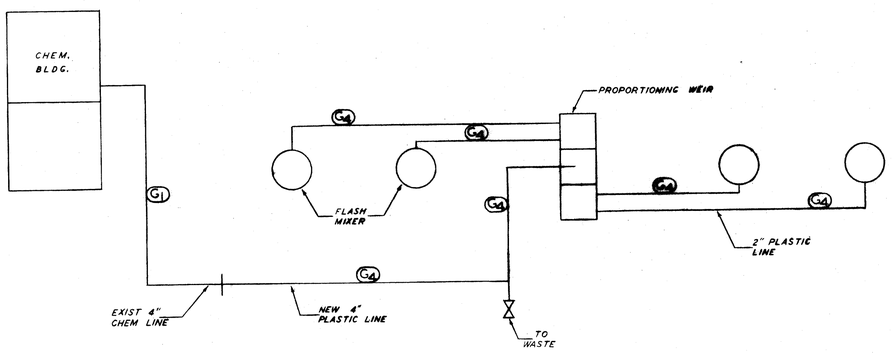
DIFFUSION WATER - LINE B
CARBON DIOXIDE - LINE A



pH SAMPLER - LINE J



MISCELLANEOUS DRAIN - LINES $M_1, M_2, M_3, M_4, M_5, \& M_6$



COAGULANT - LINES G_1 & G_4

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
3			
2			
1	9-20-55	As Built Corrections	JPS

DESIGNED L K S | CHECKED L K S
DETAILED J T S | APPROVED G E H

JOB NO. 52-34D

SCALE 1" = NONE

SHEET NO. 16

1955

5870-D3/A 54/136

MICROFILMED

Piping Diagrams (No. 2)

Ground Elev. 36'-0"

10% Slope

℄ Elev. 39'-0"

℄ Elev. 38'-6" to 38'-8"

10'-0" | 10'-0" | 11'-0" | 9'-0" | 10'-0" | 10'-0" | 10'-0" | 10'-0" | 10'-0" | 2'-9" | 7'-3" | 5'-9" | 4'-3"

1-2" Coag. Line

To existing 8" Service Line

To existing 4" Coag.

Add 4" Coag. Blind Flange

To existing 4" Gas

To existing Sludge Pump House (¾" Oil)

27'-0"

℄ Elev. 27'-0"

℄ 4" Floor Drain - Elev. 26'-5"
See Sh't. #18 for details

1-2" Coag. Line

℄ Elev. 39'-0"

℄ Elev. 38'-6" to 38'-8"

3 - Req'd. (See Sh't. #19 for location of fire hydrants)

Flush Type Fire Hydrant

See "Typical Rock Detail" this Sh't. (10'-0" centers)

8" Service Line

Future 4" Silica Line

℄ Elev. 27'-0"

2'-0"

Access ladder from Pipe Tunnel to Sump Pump See Sh't. #E-23 for Details.

℄ 8" C.I. Floor Drain & Pipe - Elev. 26'-5"
℄ 6" C.I. Recarb. Basin Drain Line - Elev. 26'-0"
See Sh't. #18

℄ 4" Coag. Lines See Sh't. #22

4" Gas

℄ 4" Comp.

℄ 4" CO_2 Unit

Floor Elev. 41'-0"

℄ Elev. 39'-0"

℄ Elev. 38'-6" to Elev. 38'-8"

℄ ¾" Oil Line

℄ 2½" Oil Line

℄ Elev. 27'-0"

Note:
For Schematic Piping to Producer Station & location - See Sh't. #13, 16, & #22.

Fuel Oil Return Sump - See Sheet #22 for Details

3'-0"

P-1326

Pipe Clamps

Anchor to Pipe Vault Wall @ 1'-0" ctrs as shown.

Note: Use "Unistrut" metal framing, or equal.

3'-6" ± (Anchor to ceiling) Varies

1'-0"

P-1001

Future Silica

P-1000

P-1066

Gas

Oil

P-1326

1" Htg. Line (Cross Supply & return Lines to opposite sides of rack at 20'-0"± intervals to provide expansion loops).

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
1	9-24-57	As Built Corrections	MW

DESIGNED | CHECKED
DETAILED R G S | APPROVED G E H

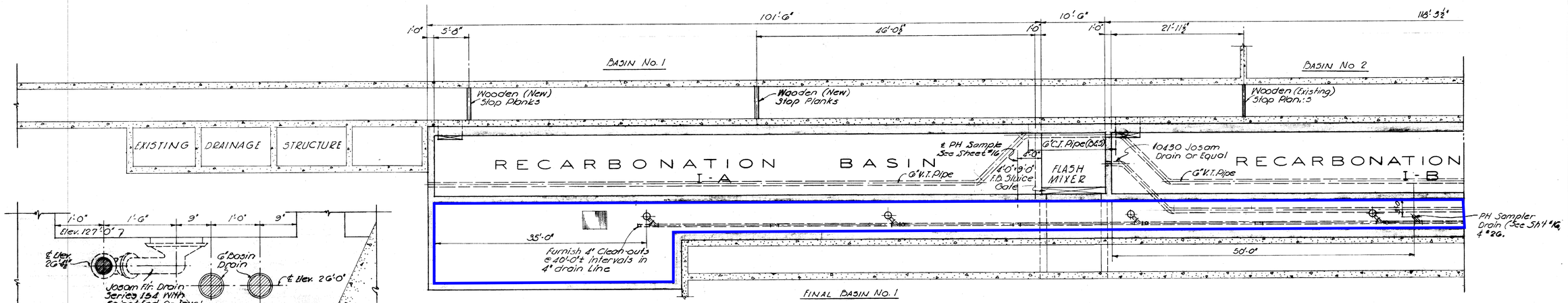
JOB NO. 52-34D

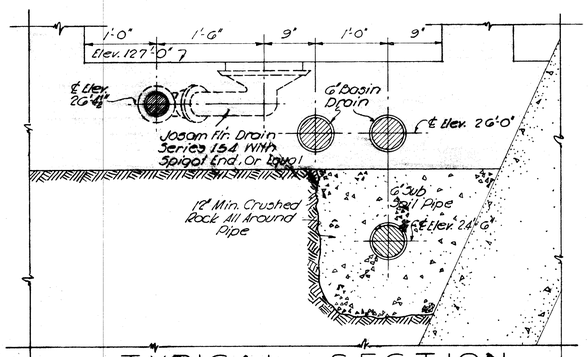
1953

SCALE : ¼" = 1'-0"

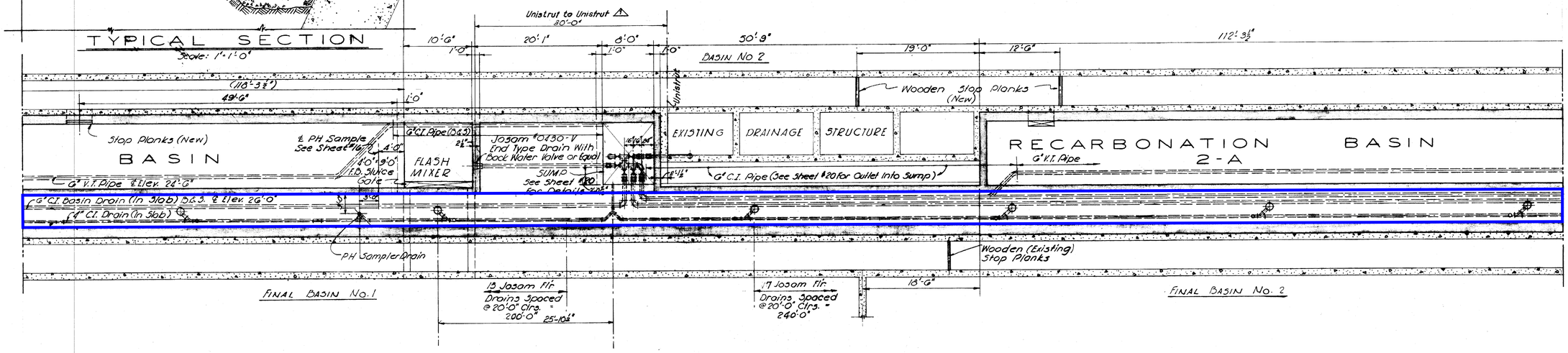
SHEET 17

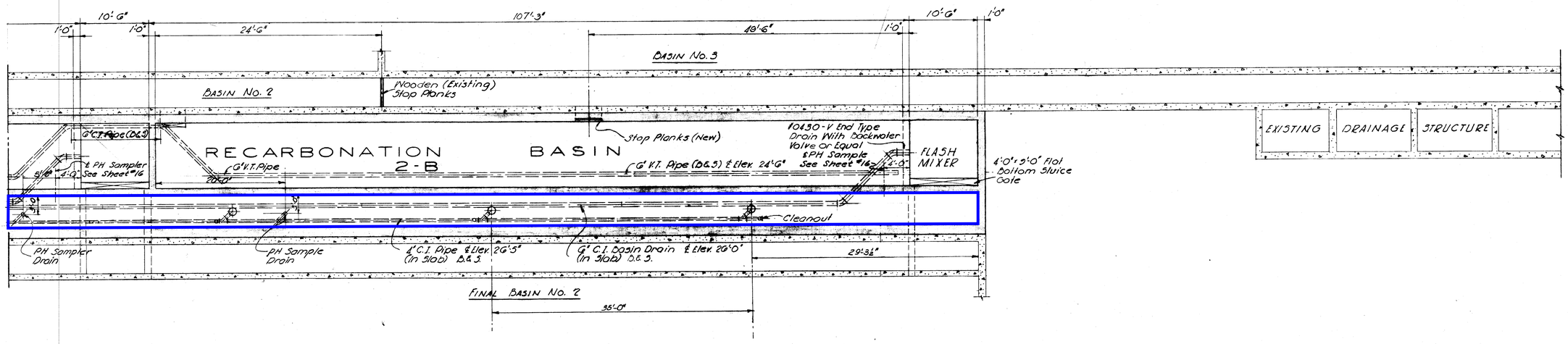
D-70-D-314 Sh 17/30





TYPICAL SECTION
Scale: 1"=1'-0"





CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.

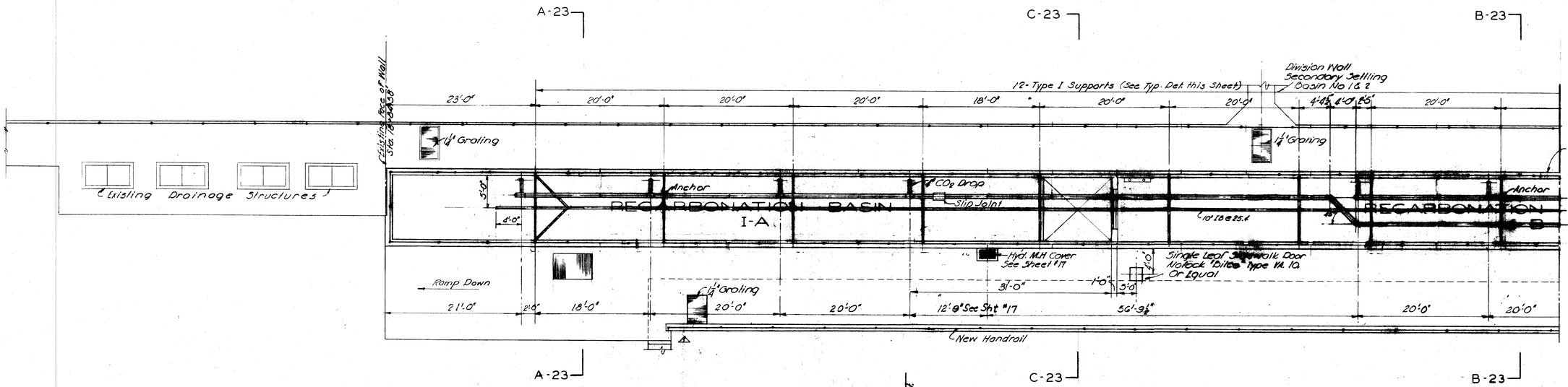
BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
1	12-28-55	As Built Corrections	J.Del

DESIGNED | CHECKED
DETAILED R R F | APPROVED G E H

JOB NO. 52-34D
1953
SCALE : 1/4" = 1'-0"
SHEET -REV 15 -

5670-D-3/A Sh 15/30



CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

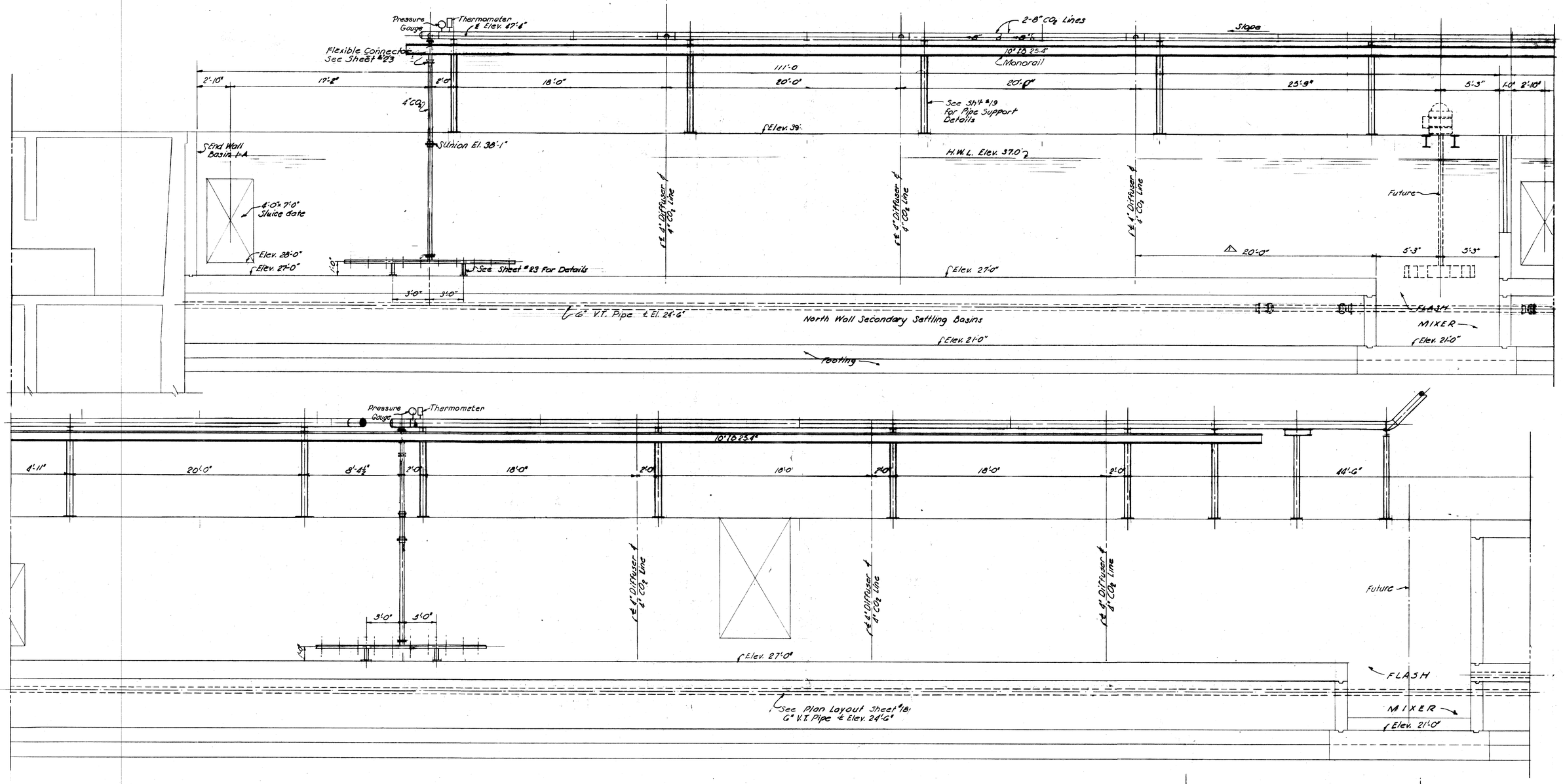
NO.	DATE	REVISIONS	BY
1	8-8-57	As Built Corrections	JPH

DESIGNED — CHECKED
DETAILED R G S — APPROVED G E H

JOB NO. 52-340
1953
SCALE : 1/8" = 1'-0"
SHEET - REV. 19 -

5670-D-31A Sht #20

MICROFILMED



SECTION A-20

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

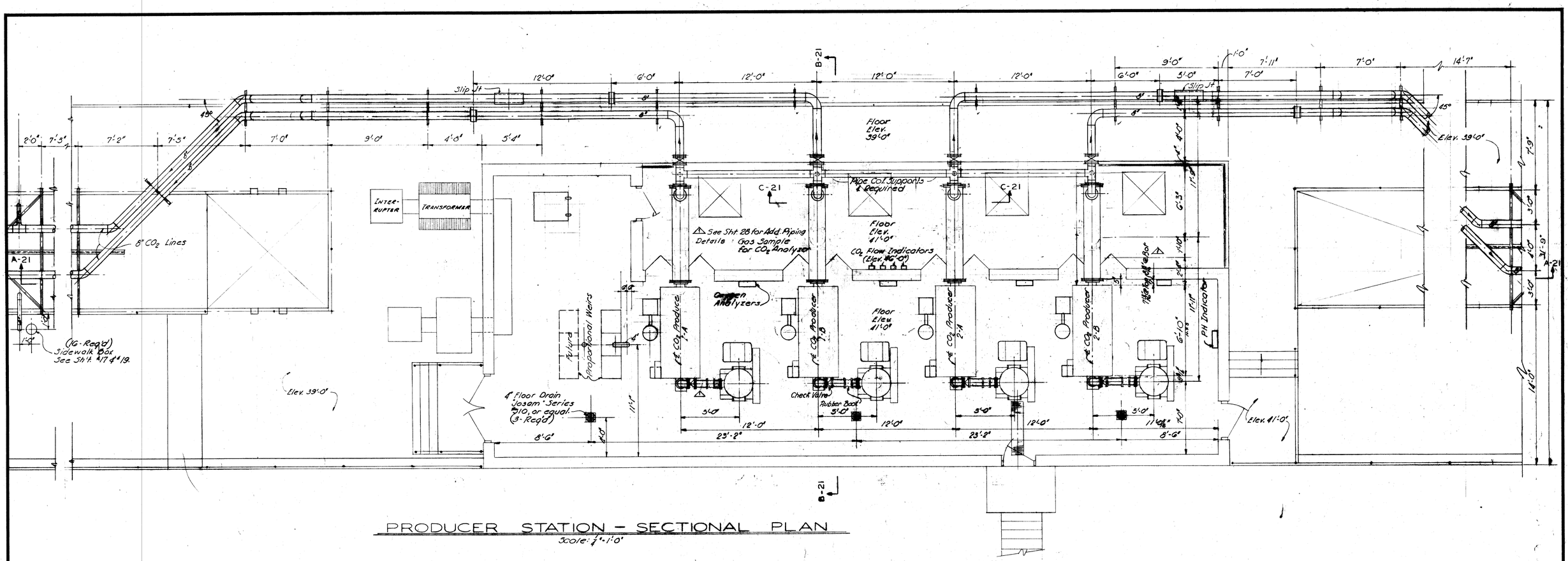
NO.	DATE	REVISIONS	BY
1			
2			
3	2-25-55	As Built Corrections	J.D.H.

DESIGNED
DETAILED R G S
CHECKED
APPROVED G E H

JOB NO. 52-34D
1953
SCALE : 1/4" = 1'-0"
SHEET -REV. 20 -

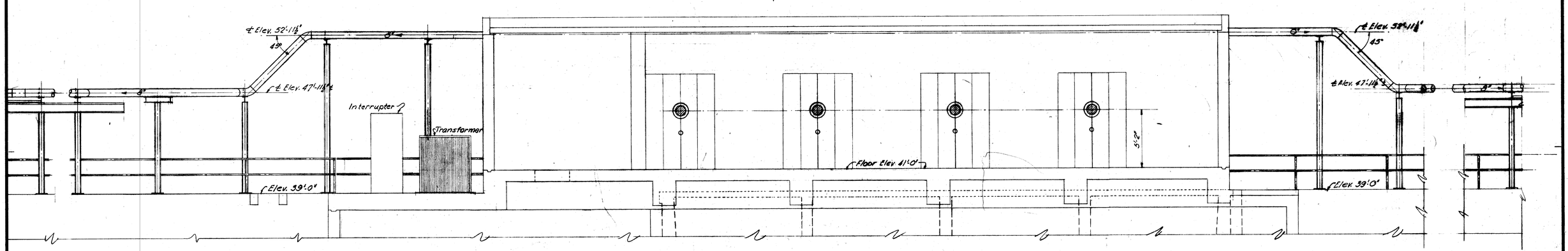
5670-D 31A 54 2/30

MICROFILMED



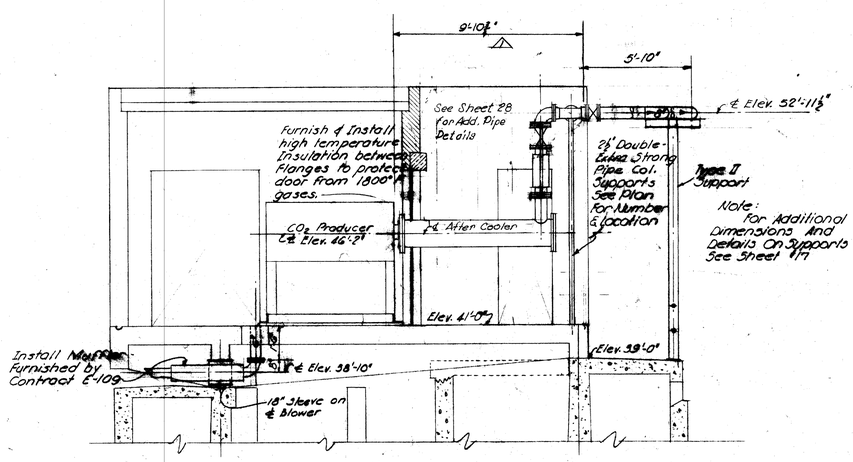
PRODUCER STATION – SECTIONAL PLAN

Scale: 1/4"-1'-0"



SECTION A-21

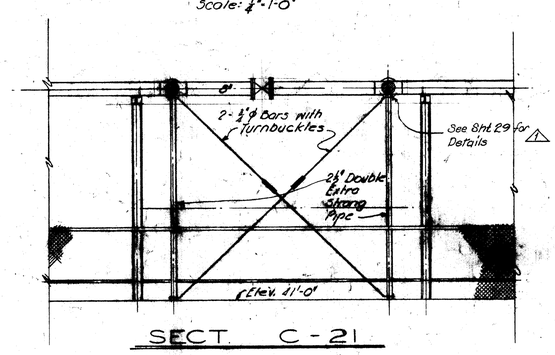
Scale: 1/4"-1'-0"



SECTION B-21

Scale: 1/4"-1'-0"

(Typical all CO_2 Producers)



SECT C-21

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
1	6-24-55	As Built Corrections	J.D.A.

DESIGNED	CHECKED
DETAILED R.G.S	APPROVED

JOB NO. 52-340

1953

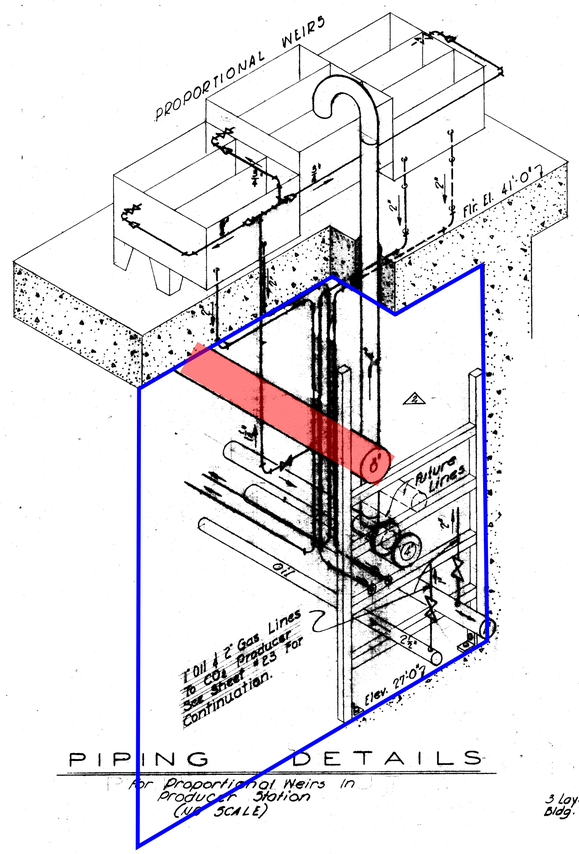
SCALE : 1/4" = 1'-0"

SHEET NO. 22/30

5670-D-31A SH 22/30

MICROFILMED

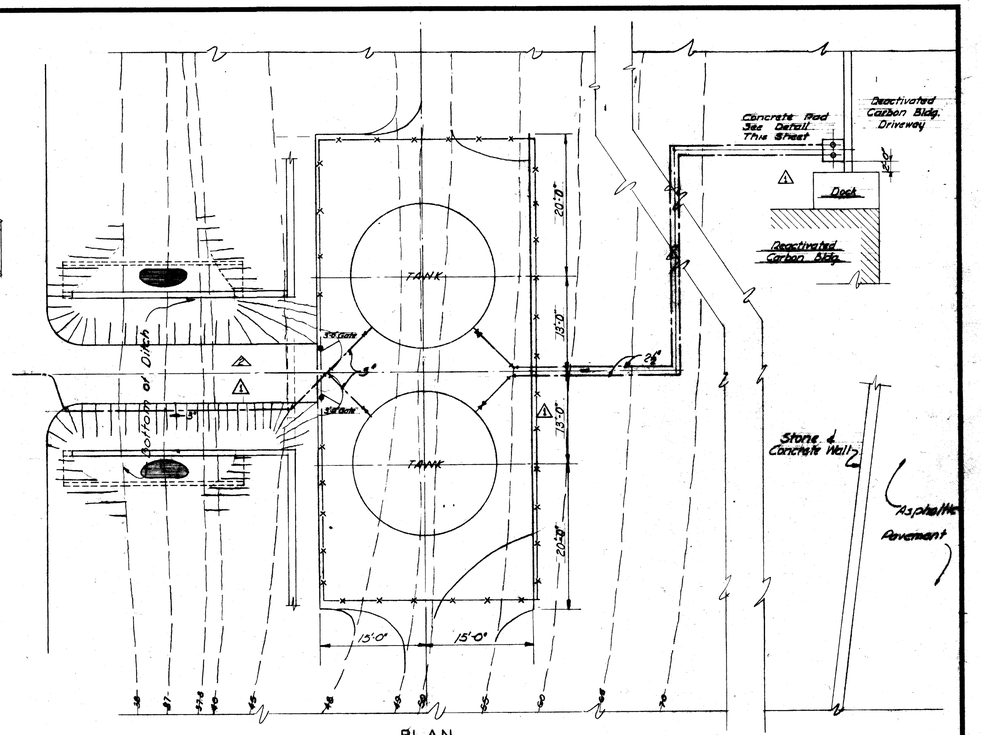
52-34D -22-



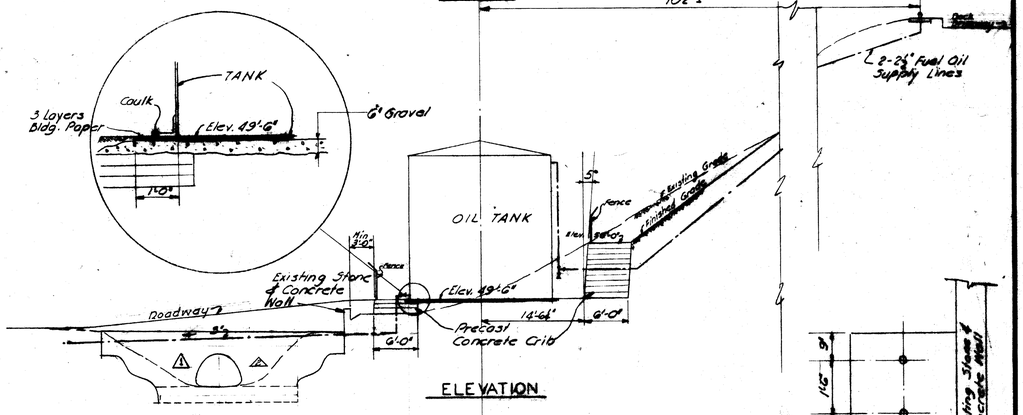
PIPING DETAILS

for Proportional Weirs in Producer Station

(No SCALE)

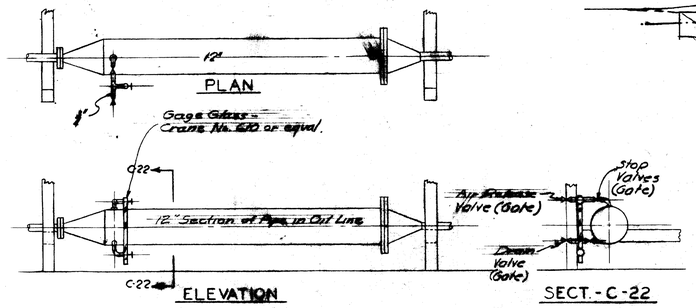


PLAN

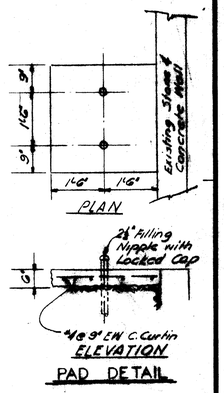


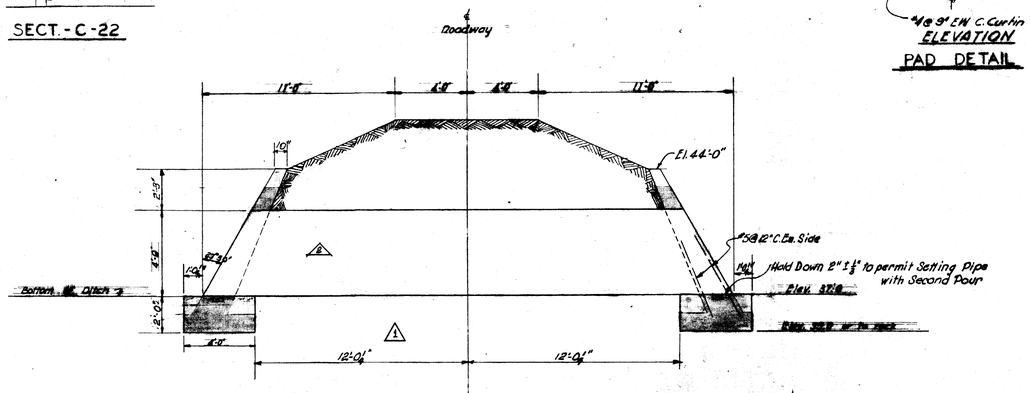
ELEVATION

FUEL OIL SUPPLY SYSTEM



FUEL OIL RETURN SUMP





SECTION THRU DRAIN

CONTRACT C-109

CONSTRUCTION OF RECARBONATION FACILITIES

WATER WORKS IMPROVEMENTS

AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.

KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
2	6-25-53	As Built Corrections	W.D.J.
1	12-8-52	General Revisions	W.D.J.

DESIGNED	W & G	CHECKED	W.E.C.
DETAILED	R.R.P.	APPROVED	G.S.H.

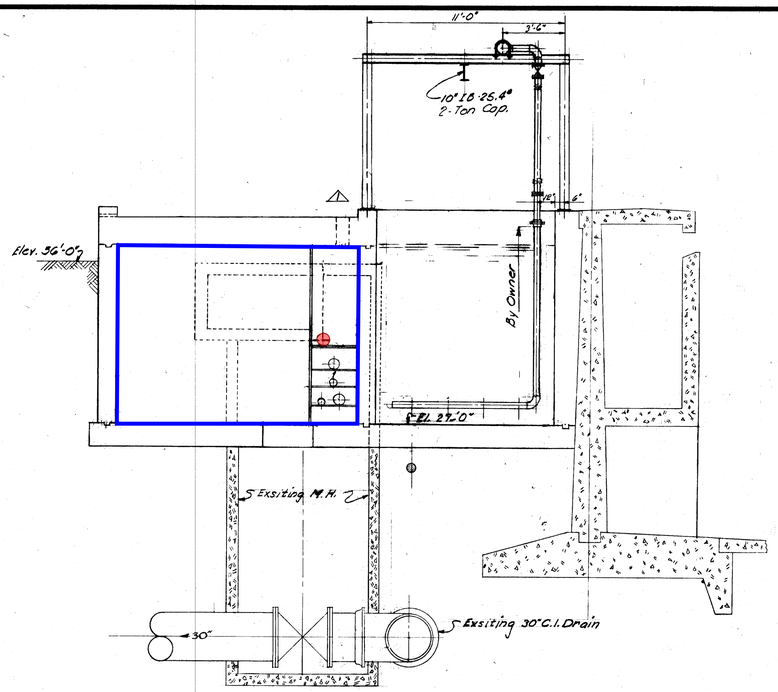
JOB NO. 52-34B

1953

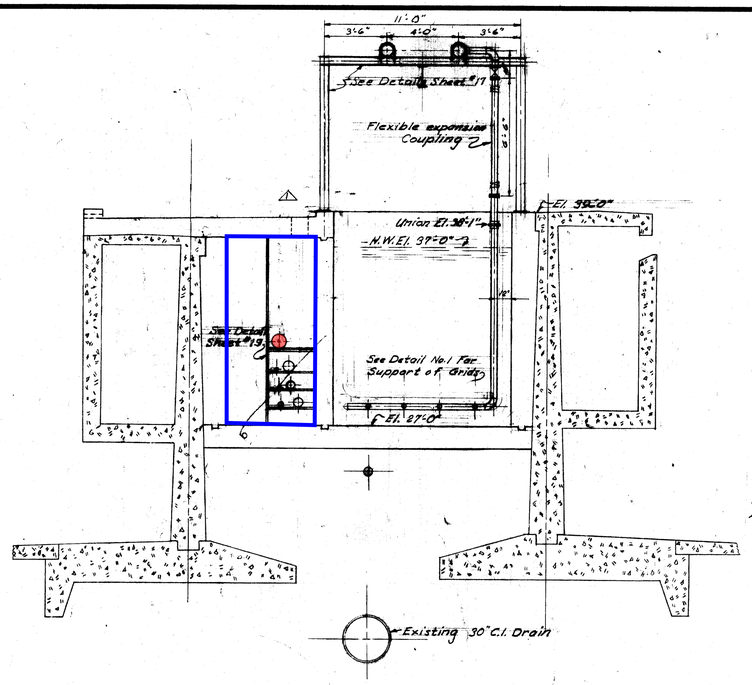
SCALE : NOTED

SHEET NO. 22-1

MICROFILMED

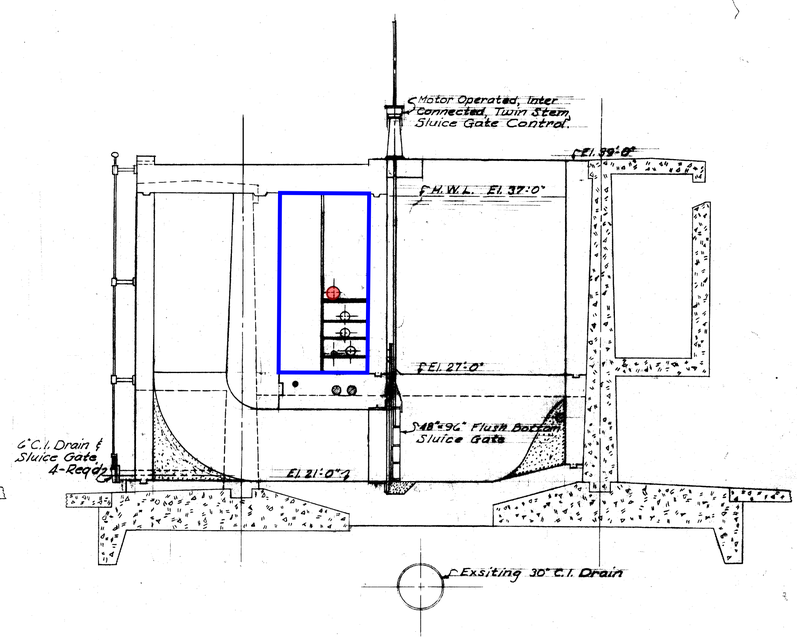


SECTION A-23

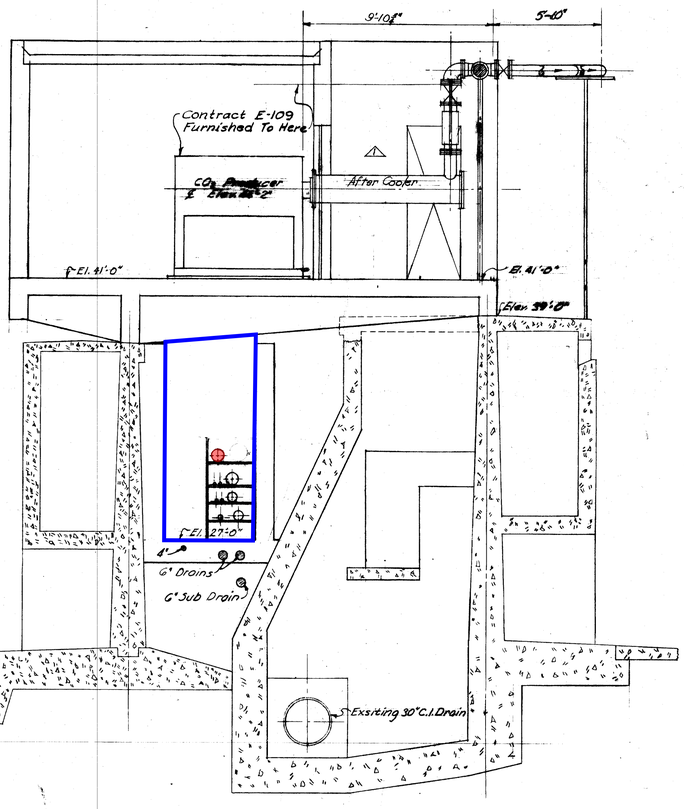


SECTION B-23

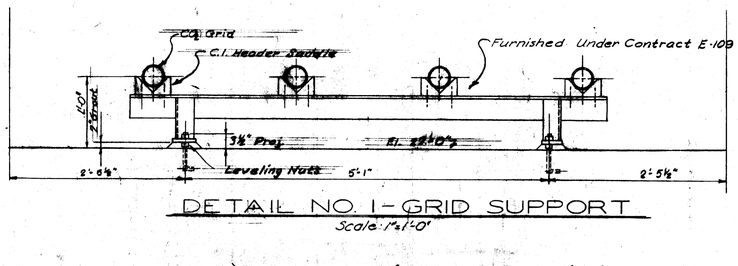
Typical Section Thru Recarbonation Basins



SECTION C-23

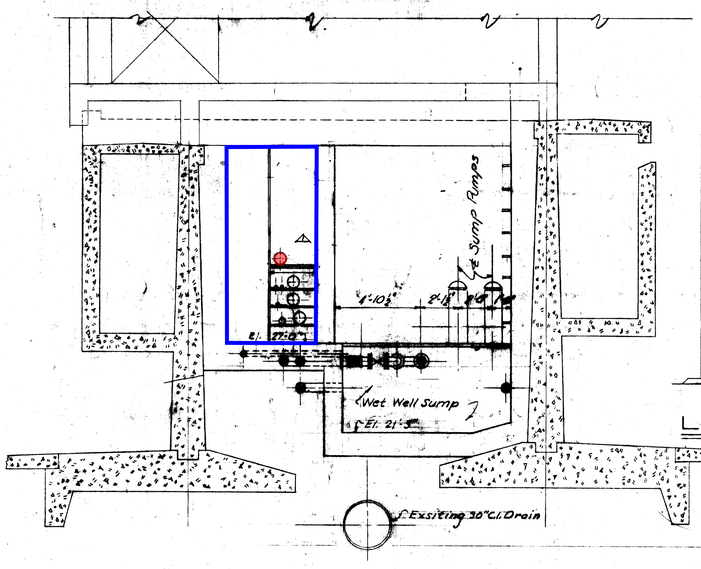


SECTION D-23



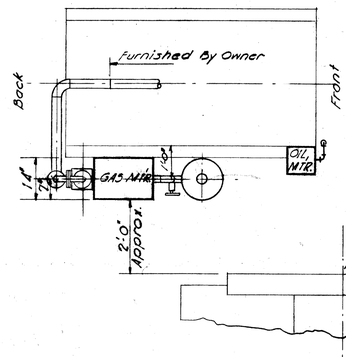
DETAIL NO. 1 - GRID SUPPORT

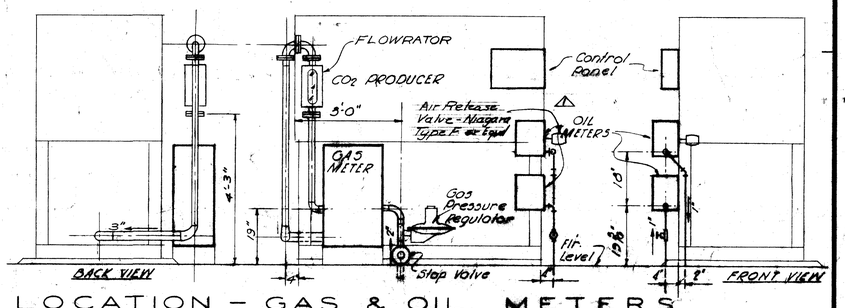
Scale: 1"=1'-0"



SECTION E-23

Note: See Sh'ts #18 & #20 for Sump Discharge Details.





LOCATION - GAS & OIL METERS

Scale: ½" 1'-0"

CONTRACT C-109

CONSTRUCTION OF RECARBONATION FACILITIES

WATER WORKS IMPROVEMENTS

AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.

KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
1	9-24-53	As Built Corrections	J.B.H.

DESIGNED	CHECKED
DETAILED	APPROVED G E M

JOB NO. 52-34D

1953

SCALE 1" = 1'-0"

SHEET NO. 23

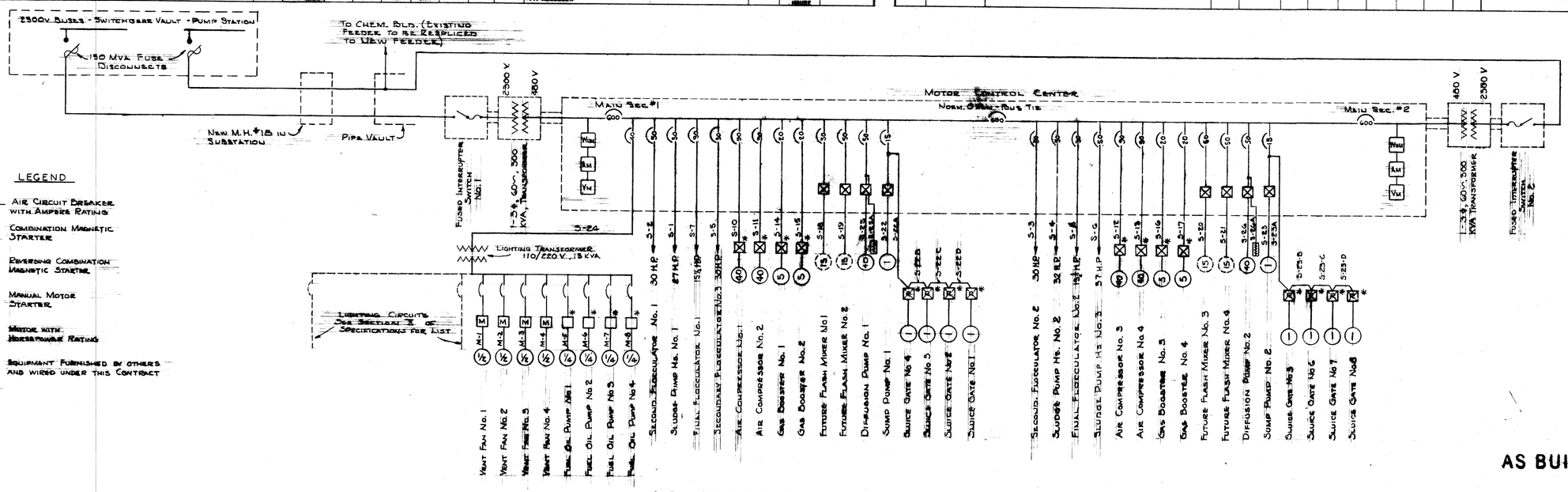
25-340 -25-

CIRCUIT NUMBER	FROM EQUIPMENT: EQUIPMENT DESCRIPTION	MANUFACTURER & MFR'S TYPE DWG. NO.	LOCATION	TO EQUIPMENT: EQUIPMENT DESCRIPTION	APPROXIMATE CIRCUIT LENGTH	MANUFACTURER & MFR'S TYPE DWG. NO.	LOCATION	EQUIPMENT RATING: HP OR KVA	VOLTS	PHASE	FREQ.	AMPS	POWER CIRCUIT DATA: NO. OF CONDUCTORS	SIZE AWG OR MCM	TYPE	CABLE INSUL. VOLTAGE	SIZE CONDUIT	OTHER RACEWAY	DISCONNECT DEVICE: F.S.D. A.C.B. AMPS	D.S.C.B. AMPS	D.S. SW. AMPS		LOCATION	MOTOR STARTER DATA: TYPE	NEMA SIZE		LOCATION	CONTROL SWITCH DATA: TYPE	NEMA ENCLOSURE	IND. LIGHTS	LOCATION	MISCELLANEOUS
HV-1	2300v Bus - North wall		Pump Sta.	Interrupter Switch #1	1400'		Producer House	300	2300v	x	75		3	2/0	VCL	5 Kv	3"	5" Duct	x	x	x	Fuse Disconn.	Pump Station	x	x		x	x	x		x	
HV-2	2300v Bus - South wall		Pump Sta.	Interrupter Switch #2	1400'		Producer House	300	2300v	x	75		3	2/0	VCL	5 Kv	3"	5" Duct	x	x	x	Fuse Disconn.	Pump Station	x	x		x	x	x		x	
S-1	Motor Control Center		Producer House	Sludge Pump House No.1 Splice Box	300'		See Layout	27	440v	x	35		3	6	SRN	600 v	2"	x	x	50*	x	1	MTR.C.C.	x	x		x	x	x		x	
S-2	Motor Control Center		Producer House	Secondary Flocculators No.1 Splice Box	130'		See Layout	30	440v	x	39		3	6	SRN	600 v	2"	x	x	50*	x	2	MTR.C.C.	x	x		x	x	x		x	
S-3	Motor Control Center		Producer House	Secondary Flocculators No.2 Splice Box	130'		See Layout	30	440v	x	39		3	6	SRN	600 v	x	x	x	50*	x	3	MTR.C.C.	x	x		x	x	x		x	
S-4	Motor Control Center		Producer House	Sludge Pump House No.2 Splice Box	50'		See Layout	32	440v	x	44		3	6	SRN	600 v	1½"	x	x	50*	x	4	MTR.C.C.	x	x		x	x	x	Run in conduit with S-2	x	
S-5	Motor Control Center		Producer House	Secondary Flocculators No.3 Splice Box	230'		See Layout	30	440v	x	39		3	6	SRN	600 v	1½"	x	x	50*	x	5	MTR.C.C.	x	x		x	x	x		x	Extensions to Existing Circuits
S-6	Motor Control Center		Producer House	Sludge Pump House No.3 Splice Box	420'		See Layout	37	440v	x	48		3	4	SRN	600 v	2"	x	x	50*	x	6	MTR.C.C.	x	x		x	x	x		x	
S-7	Motor Control Center		Producer House	Final Flocculation No.1 Splice Box	100'		See Layout	15	440v	x	20		3	8	SRN	600 v	1"	x	x	30*	x	7	MTR.C.C.	x	x		x	x	x		x	
S-8	Motor Control Center		Producer House	Final Flocculation No.2 Splice Box	200'		See Layout	15	440v	x	20		3	8	SRN	600 v	1"	x	x	30*	x	8	MTR.C.C.	x	x		x	x	x		x	
S-10	Motor Control Center		Producer House	Air Compressor No.1 Starter	30'		Producer House	40	440v	x	52		3	6	SRN	600 v	1½"	x	x	50*	x	10	MTR.C.C.	Comb.*	1	On Unit	P.B.*	1	x	On Unit		
S-11	Motor Control Center		Producer House	Air Compressor No.2 Starter	40'		Producer House	40	440v	x	52		3	6	SRN	600 v	1½"	x	x	50*	x		MTR.C.C.	Comb.*	1	On Unit	P.B.*	1	x	On Unit		
S-12	Motor Control Center		Producer House	Air Compressor No.3 Starter	50'		Producer House	40	440v	x	52		3	6	SRN	600 v	1½"	x	x	50*	x		MTR.C.C.	Comb.*	1	On Unit	P.B.*	1	x	On Unit		
S-13	Motor Control Center		Producer House	Air Compressor No.4 Starter	65'		Producer House	40	440v	x	52		3	6	SRN	600 v	1½"	x	x	50*	x		MTR.C.C.	Comb.*	1	On Unit	P.B.*	1	x	On Unit		
S-14	Motor Control Center		Producer House	Gas Booster No.1 Starter	30'		Producer House	5	440v	x	7.5		3	12	SRN	600 v	¾"	x	x	20*	x		MTR.C.C.	Comb.*	1	On Unit	P.B.*	1	x	On Unit		
S-15	Motor Control Center		Producer House	Gas Booster No.2 Starter	40'		Producer House	5	440v	x	7.5		3	12	SRN	600 v	¾"	x	x	20*	x	15	MTR.C.C.	Comb.*	1	On Unit	P.B.*	1	x	On Unit		
S-16	Motor Control Center		Producer House	Gas Booster No.3 Starter	50'		Producer House	5	440v	x	7.5		3	12	SRN	600 v	¾"	x	x	20*	x		MTR.C.C.	Comb.*	1	On Unit	P.B.*	1	x	On Unit		
S-17	Motor Control Center		Producer House	Gas Booster No.4 Starter	60'		Producer House	5	440v	x	7.5		3	12	SRN	600 v	¾"	x	x	20*	x		MTR.C.C.	Comb.*	1	On Unit	P.B.*	1	x	On Unit		
S-18	Motor Control Center		Producer House	Flash Mixer No.1 Junction Box	120'		Pipe Vault	15	440v	110v AC	20		3	8	SRN	600 v	1	x	x	50*	x		MTR.C.C.	Comb.*	1	MTR.C.C.	P.B.*	1	R-G*	MTR.C.C.		
S-19	Motor Control Center		Producer House	Flash Mixer No.2 Junction Box	20'		Pipe Vault	15	440v	110v AC	20		3	8	SRN	600 v	1	x	x	50*	x		MTR.C.C.	Comb.*	1	MTR.C.C.	P.B.*	1	R-G*	MTR.C.C.	Circuits terminate at junction box	
S-20	Motor Control Center		Producer House	Flash Mixer No.3 Junction Box	140'		Pipe Vault	15	440v	110v AC	20		3	8	SRN	600 v	1	x	x	50*	x	20	MTR.C.C.	Comb.*	1	MTR.C.C.	P.B.*	1	R-G*	MTR.C.C.	in pipe vault. Feeders for	
S-21	Motor Control Center		Producer House	Flash Mixer No.4 Junction Box	240'		Pipe Vault	15	440v	110v AC	20		3	8	SRN	600 v	1	x	x	50*	x		MTR.C.C.	Comb.*	1	MTR.C.C.	P.B.*	1	R-G*	MTR.C.C.	future flash mixers	
S-22	Motor Control Center		Producer House	Sump Pump No.1	20'		Pipe Vault	1	440v	110v AC	1.8		3	12	SRN	600 v	½"	x	x	15*	x		MTR.C.C.	Comb.*	1	MTR.C.C.	P.B.*	1	R-G*	MTR.C.C.		
S-22A	Motor Control Center		Producer House	Sluice Gate No.4 Starter	30'		Basin 1-B	1	440v	x	1.8		3	12	SRN	600 v	½"	x	x	15*	x		x	Rev. Comb.*	111	At Gate	P.B.*	111	x	At Gate		
S-22B	Sluice Gate No.4 Starter		Basin 1-B	Sluice Gate No.3 Starter	140'		Basin 1-B	1	440v	x	1.8		3	12	SRN	600 v	½"	x	x	15*	x		x	Rever. Comb.*	111	At Gate	P.B.*	111	x	At Gate	See one-line diagram	
S-22C	Sluice Gate No.3 Starter		Basin 1-B	Sluice Gate No.2 Starter	20'		Basin 1-A	1	440v	x	1.8		3	12	SRN	600 v	½"	x	x	15*	x		x	Rever. Comb.*	111	At Gate	P.B.*	111	x	At Gate		
S-22D	Sluice Gate No.2 Starter		Basin 1-A	Sluice Gate No.1 Starter	120'		Basin 1-A	1	440v	x	1.8		3	12	SRN	600 v	½"	x	x	15*	x		x	Rever. Comb.*	111	At Gate	P.B.*	111	x	At Gate		
S-23	Motor Control Center		Producer House	Sump Pump No.2	20'		Pipe Vault	1	440v	110v AC	1.8		3	12	SRN	600 v	½"	x	x	15*	x		MTR.C.C.	Comb.*	1	MTR.C.C.	P.B.*	1	R-G*	MTR.C.C.		
S-23A	Motor Control Center		Producer House	Sluice Gate No.5 Starter	100'		Basin 2-A	1	440v	x	1.8		3	12	SRN	600 v	½"	x	x	15*	x		x	Rever. Comb.*	111	At Gate	P.B.*	111	x	At Gate		
S-23B	Sluice Gate No.5 Starter		Basin 2-A	Sluice Gate No.6 Starter	120'		Basin 2-A	1	440v	x	1.8		3	12	SRN	600 v	½"	x	x	15*	x		x	Rever. Comb.*	111	At Gate	P.B.*	111	x	At Gate		
S-23C	Sluice Gate No.6 Starter		Basin 2-A	Sluice Gate No.7 Starter	38'		Basin 2-B	1	440v	x	1.8		3	12	SRN	600 v	½"	x	x	15*	x		x	Rever. Comb.*	111	At Gate	P.B.*	111	x	At Gate	See one-line diagram	
S-23D	Sluice Gate No.7 Starter		Basin 2-B	Sluice Gate No.8 Starter	140'		Basin 2-B	1	440v	x	1.8		3	12	SRN	600 v	½"	x	x	15*	x		x	Rever. Comb.*	111	At Gate	P.B.*	111	x	At Gate		
S-24	Motor Control Center		Producer House	Lighting Transformer & Panelboard	15'		Producer House	15	440v	x	34		2	6	SRN	600 v	1"	x	x	40*	x		MTR.C.C.	x	x		x	x	x		x	
S-25	Motor Control Center		Producer House	Diffusion Pump No.1	35'		See Layout	40	440v	110v AC	52		3	4	SRN	600 v	3"	x	x	50*	x		MTR.C.C.	Comb.*	1	MTR.C.C.	P.B.*	1	R-G*	MTR.C.C.	Delete Under	
S-26	Motor Control Center		Producer House	Diffusion Pump No.2	380		"	40	440v	110v AC	52		3	4	SRN	600 v	x	x	x	50*	x		MTR.C.C.	Comb.*	1	MTR.C.C.	P.B.*	1	R-G*	MTR.C.C.	Alterations Here	
S-25A	Motor Cont. Cent. - Diffusion Pump #1 Starter		Pump Sta.	Diffusion Pump No.1 Heater	1250		"	600w	440v	x	4		2	12	SRN	600v	x	x	x	x	x	Fuse Sw	On Starter	x	x		x	x	x	Run in Conduit w/ S-25		
S-25A'	Motor Cont. Cent. - Diffusion Pump #2 Starter		Pump Sta.	Diffusion Pump No.2 Heater	1250		"	600w	440v	x	4		2	12	SRN	600v	x	x	x	x	x	Fuse Sw	On Starter	x	x		x	x	x			
M-1	Lighting Panelboard		Producer House	Producer House Vent. Fan No.1	110'		Producer House	½	110 v	x	7.4		2	12	AVA	600	½	x	15	R	x		Ltg.Pnl.Bd.	Manual	1	South Wall	x	x	x		x	
M-2	Lighting Panelboard		Producer House	Producer House Vent. Fan No.2	95'		Producer House	½	110 v	x	7.4		2	12	AVA	600	½	x	15	x	x		Ltg.Pnl.Bd.	Manual	1	South Wall	x	x	x		x	
M-3	Lighting Panelboard		Producer House	Producer House Vent. Fan No.3	75'		Producer House	½	110 v	x	7.4		2	12	AVA	600	½	x	15	x	x		Ltg.Pnl.Bd.	Manual	1	South Wall	x	x	x		x	
M-4	Lighting Panelboard		Producer House	Producer House Vent. Fan No.4	95'		Producer House	½	110 v	x	7.4		2	12	AVA	600	½	x	15	x	x		Ltg.Pnl.Bd.	Manual	1	South Wall	x	x	x		x	
M-5	Lighting Panelboard		Producer House	Fuel Oil Pump No.1	30'		Producer House	½	110 v	x	4.6		2	12	SRN	600	½	x	15	x	x		Ltg.Pnl.Bd.	Manual*	1	On Unit	x	x	x		x	
M-6	Lighting Panelboard		Producer House	Fuel Oil Pump No.2	40'		Producer House	½	110 v	x	4.6		2	12	SRN	600	½	x	15	x	x		Ltg.Pnl.Bd.	Manual*	1	On Unit	x	x	x		x	
M-7	Lighting Panelboard		Producer House	Fuel Oil Pump No.3	50'		Producer House	½	110 v	x	4.6		2	12	SRN	600	½	x	15	x	x		Ltg.Pnl.Bd.	Manual*	1	On Unit	x	x	x		x	
M-8	Lighting Panelboard		Producer House	Fuel Oil Pump No.4	65'		Producer House	½	110 v	x	4.6		2	12	SRN	600	½	x	15	x	x		Ltg.Pnl.Bd.	Manual*	1	On Unit	x	x	x		x	
M-9	Lighting Panelboard		Producer House	Existing lights - N. Basin, secondary basins	1200'		See Layout	3.69	110 v	x	.29		2	2	SRN	600			40	x	x		Ltg.Pnl.Bd.	x	x		x	x	x		x	

MISCELLANEOUS WIRING

CIRCUIT NO.	FROM EQUIPMENT: EQUIPMENT DESCRIPTION	MFR'S TYPE DWG. NO.	LOCATION	FROM TERMINAL BOARD	CIRCUIT DATA: CONDUCTORS	SIZE	INSULATION	TO TERMINAL BOARD	TO EQUIPMENT: EQUIPMENT DESCRIPTION	LOCATION	MFR'S TYPE DWG. NO.
C-1	CO_2 Flow Meter Transmitter #1		Gallery		2	12	SRN		CO_2 Flow Meter Indicator #1	Producer House	
C-2	CO_2 Flow Meter Transmitter #2		Gallery		2	12	SRN		CO_2 Flow Meter Indicator #2	Producer House	
C-3	CO_2 Flow Meter Transmitter #3		Gallery		2	12	SRN		CO_2 Flow Meter Indicator #3	Producer House	
C-4	CO_2 Flow Meter Transmitter #4		Gallery		2	12	SRN		CO_2 Flow Meter Indicator #4	Producer House	
C-5	PH Transmitter #1		Pipe Vault		4	12	SRN		PH Recorder	Producer House	

CIRCUIT NO.	FROM EQUIPMENT: EQUIPMENT DESCRIPTION	LOCATION	FROM TERMINAL BOARD	CIRCUIT DATA: CONDUCTORS	SIZE	INSULATION	TO TERMINAL BOARD	TO EQUIPMENT: EQUIPMENT DESCRIPTION	LOCATION
C-6	PH Transmitter #2	Pipe Vault		4	12	SRN		PH Recorder	
C-7	PH Transmitter #3	Pipe Vault		4	12	SRN		PH Recorder	
C-8	PH Transmitter #4	Pipe Vault		4	12	SRN		PH Recorder	



LEGEND

- Air Circuit Breaker with Ampere Rating
- Combination Magnetic Starter
- Reversing Combination Magnetic Starter
- Manual Motor Starter
- Motor with Horsepower Rating
- * Equipment Furnished by others and wired under this Contract

ONE LINE DIAGRAM
NO SCALE

Note: Motor C.C. Unit Substation Furnished Complete Under Cont. #102A Except the 1500 KVA Transformer Which is Existing.

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
1	9-26-58	As Built Corrections	JDJ

DESIGNED N A C | CHECKED N A C
DETAILED G A M | APPROVED B E

JOB NO. 52-340

1953

SCALE : NONE

SHEET NO. 24

5670-03/A 54 25/30

MICROFILMED

SECONDARY BASIN #2

CO_2 FLOW METER TRANSMITTERS IN PIPING

#1 C-1, L-9 L-10 · #2 C-2, L-9 L-10 · #3 C-3, L-9 L-10 · L-9, C-4 L-10 #4

SWITCH FOR PIPE VAULT LIGHTS

LIGHTING PANELBOARD

RECARBONATION BASIN 1B

#6 BARE COPPER GND. CABLE LOOP IN SLAB.

MOTOR CONTROL CENTER

LIGHTING PANELBOARD

15 KVA LIGHTING TRANSFORMER

CONDUIT IN SLAB

C-3, L-5 C-4, L-10

L-9, C-1 L-10, C-2

CO_2 FLOW METER INDICATORS

OXYGEN ANALYZERS

OXYGEN ANALYZERS

PH RECORDER

RECARBONATION BASIN 2A

CO_2 PRODUCER NO. 1 · CO_2 PRODUCER NO. 2 · CO_2 PRODUCER NO. 3 · CO_2 PRODUCER NO. 4

PIPE VAULT

2" STUB THRU FLR. FOR FUT. TELEPHONE

M-5 5-10 5-14 · M-6 5-11 5-15 · M-7 5-12 5-16 · M-8 5-13 5-17

VENT FAN STARTERS M-1 M-2 M-3 M-4

FINAL BASIN #1

FINAL BASIN #2

PLAN - PRODUCER HOUSE
SCALE: 1/4"=1'-0"

ALL CABLE ON N. SIDE TO BE REPLACED

FEEDERS TO REVERSE DEFLUSE LIGHTS

EXISTING 250 W FLOOD LIGHTS

EXISTING CABLE TO BE USED ON W. SIDE

SECONDARY SETTLING BASINS #1 #2 #3

CABLE ON S. SIDE TO BE REPLACED

M-5

PRODUCER HOUSE

S-25, S-25A S-26, S-26A

NOTE: DELETE S-25 & S-26 UNDER ALTERNATE B.I.D.

FINAL SETTLING BASINS #1 #2

EXISTING M.H.

S-25 #1 DIFFUSION WATER PUMPS #2 S-26

HV-1 HV-2

FILTER BLDG

NEW M.H. #18

SUB STA.

PUMP STATION

GENERAL LAYOUT WATER PLANT
SCALE 1"=80'

TO SWITCH ABOVE EL. 41'-0"

S-22 J · S-23 · #1 #2 SUMP PUMPS

L3 100W

GROUND RODS AND GND. CABLE LOOP TO TRANSFORMER ROD - 3/4"x8' COPPERWELD CABLE - #2 BARE STRANDED COPPER

GROUND ROD FOR LIGHTING CIRCUITS

PLAN - PIPE VAULT BELOW PRODUCER HOUSE
SCALE 1/4"=1'-0"

DETAIL - BASIN LIGHT

CO_2 PIPING OVER RECARBONATION BASINS

BENJAMIN "VAPOLET" W. - CLOSE & GUARD CAT. NO. 7121-A OR EQUAL

BENJAMIN SHALLOW DOME REFLECTOR NO. 148 OR EQUAL

1'-0"

TYPE "AVA" MYSTORS PROTECTED LINE "M" OR USED IN CONDUCTED PIPE SUPPORTS - SEE SPECIFICATIONS PART II

6'-3"

WEATHER PROOF CONVENIENCE OUTLET

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
3			
2			
1	9-2855	As Built Corrections	JPM

DESIGNED N A C · CHECKED N A C
DETAILED G A M · APPROVED B E

JOB NO. 52-340 · 1953 · SCALE : AS NOTED · SHEET - REV. 23 -

MICROFILMED

To Sludge Pump House No. 1

Secondary Basin No. 1

Temporary Route S-1 During Construction

Existing Flood Light 250W

To Secondary Flocculators No. 1 & No. 2

Temporary Main 480 Volt Feeder To Panelboard

M-5 To Existing Flood Lights on S. Wall Basin #1 & to Existing Flood and Reverse Deflux Lights Along N. Wall of Basins #1, #2, & #3. Bury Cable 2' Below Grade.

Existing "LB" at Splice Point

S-1 2'C

Gate No. 1

S-22D

M-5

Recarbonation Basin No. 1-A

HV-1 HV-2

100W

Existing Manhole To Be Removed

L-7 Pipe Vault

S-22C

Future Flash Mixer No. 1

Gate No. 5

S-22B

Install New Junction Box at Splice Point. See Detail "A"

S-2 & S-3 - Run in Same Conduit in Basin Wall

Existing 480 Volt Panelboard

Gate No. 2

C-15

Ph Transmitter #1

C-5

C-7

Existing Feeder to Chemical Building (2 Cables Pulled in Only One Spliced)

New Splice for Chemical Building Feeder

Existing 2300 V Feeders To Be Removed

Existing Transformer Vault To Be Removed

Existing "LB" Inside of Transformer Vault - Splice Point

2" Stub 1'-6" Below Grade for Future Telephone Cable

Existing 2300 Volt Feeder from Substation to Be Replaced by New Feeder HV-1 & HV-2 To Pump Station

Existing Flood Light

To Final Flocculators No. 1

Final Basin No. 1

To Sludge Pump House No. 2

Secondary Basin No. 2

Existing Flood Light

Temporary Location of Panelboard on Rail

Temporary Circuits During Construction

Future Flash Mixer No. 2

Motor Control Center Unit Substation

Junct. Box in Pipe Vault Wall at El. 32'-0"±

Install Splice Box Inside Existing Drainage Structure

Gate No. 5

S-25A

S-25B

Recarbonation Basin No. 1-B

Recarbonation Basin No. 2-A

S-1 S-7 S-18 S-22C

Gate No. 4

S-22A

Ph Transmitter #2

C-6

S-15

HV-1 HV-2

L-6

L-4

M-97

S-4 S-20, S-25

S-5 S-21

S-6 S-23

S-24

Ph Recorder

S-23, S-26A

S-26, S-26A

C-5 C-6 C-7 C-8

L-5

Pipe Vault

Ph Transmitter #3

Producer House

Delete Under Alternate Bid

Locate on Wall Below Bracket Mounted Light (4'-0" Above Fin)

Final Basin No. 1

Final Basin No. 2

To Secondary Flocculators No. 3

To Sludge Pump House No. 3

Secondary Basin No. 3

Existing Flood Light

Install New Junction Boxes

See Detail "B"

S-5

Future Flash Mixer No. 3

Gate No. 7

Splice Point See Detail "C"

S-23C

S-23D

Recarbonation Basin No. 2B

Future Flash Mixer No. 4

Gate No. 6

S-23B

S-20

S-5

Ph Transmitter #4

C-8

L-7

S-21

S-6

Existing "LB" at Splice Point

Existing Flood Light

To Final Flocculators No. 2

Final Basin No. 2

Existing 1½" Conduit (Possibly Two Conduits)

Existing Concrete

10"x10"x6" C.I. Junction Box with Gasketed Cover Equal to G.E. Supply Type T&B. Set Flush with Top of Walkway & Wall

Splice

New 2" Conduit

New Concrete or Basin Wall

Detail "A" Splice Box

Scale: 1"=1'-0"

4"x8"x6" C.I. Junction Box with Gasketed Cover Equal to G.E. Supply Type T&B. Set Flush with Top of Wall

1½" Conduit

New Concrete or Basin Wall

Detail "B"

Scale: 1"=1'-0"

Existing 1½" Conduit

6"x8"x6" C.I. Junction Box with Gasketed Cover Equal to G.E. Supply Type T&B. Set Flush with Top of Wall & Walkway

New 1½" Conduit

Splice

New Concrete or Basin Wall

Detail "C"

Note: This sheet, in General, Shows only Circuits Extending Outside or Outside the Producer House. For Circuits Completely Within the Producer House Area See "Elec. Layout - Sht. 1"

LEGEND

- Existing Circuits to Be Relocated, Removed or Reinstalled
- Temporary Circuits
- New Circuits (Hidden)
- New Circuits (Exposed)
- Existing Structures & Equipment to Be Removed or Relocated
- Lighting Circuits
- Symbol of Conductor Size
- Light or Conv. Outlet Mtd. on Col. Pilings Supports
- Light or Conv. Outlet in Pipe Vault

CONTRACT C-108

CONSTRUCTION OF RECARBONATION FACILITIES

WATER WORKS IMPROVEMENTS

AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.

KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
1	4-28-55	As Built Corrections	J.D.J.

DESIGNED N.A.C. CHECKED N.A.C.

DETAILED G.A.M. APPROVED B.E.

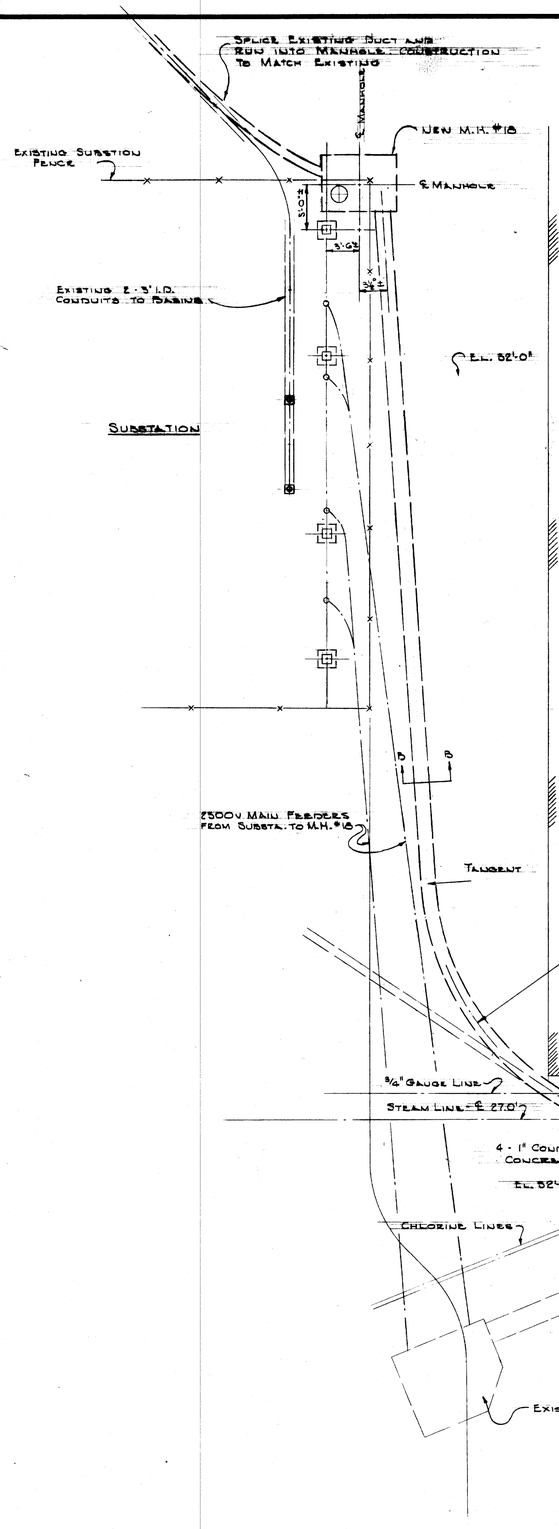
JOB NO. 52-24D

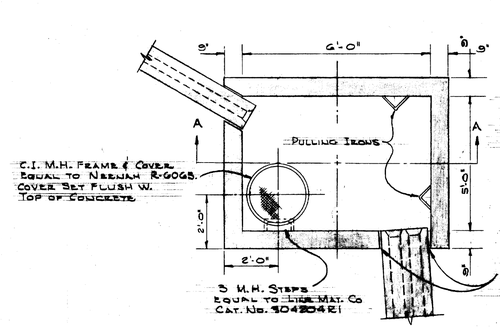
1953

SCALE 1"=60'

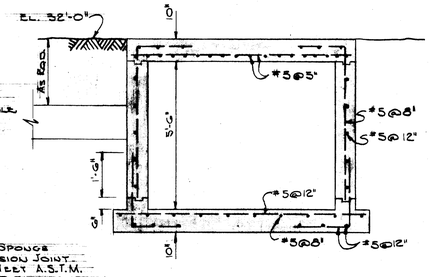
SHEET NO. 25

MICROFILMED

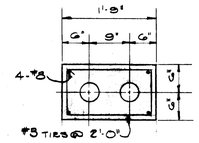




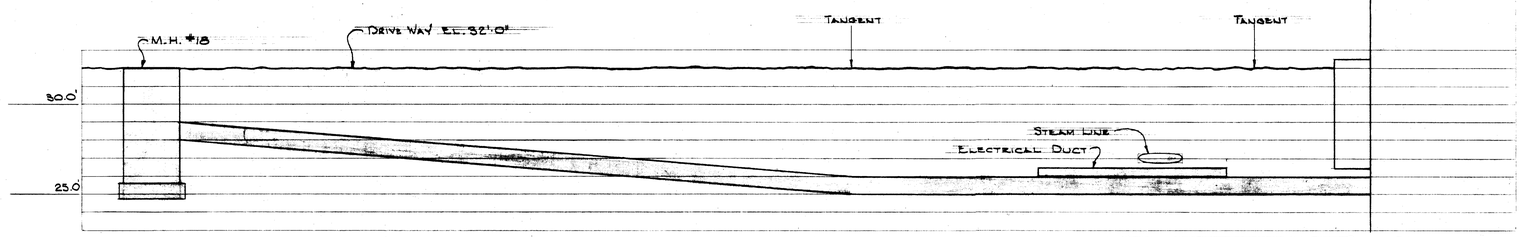
Plan - M.H. #18
3/8" = 1'-0"



Section A-A
3/8" = 1'-0"

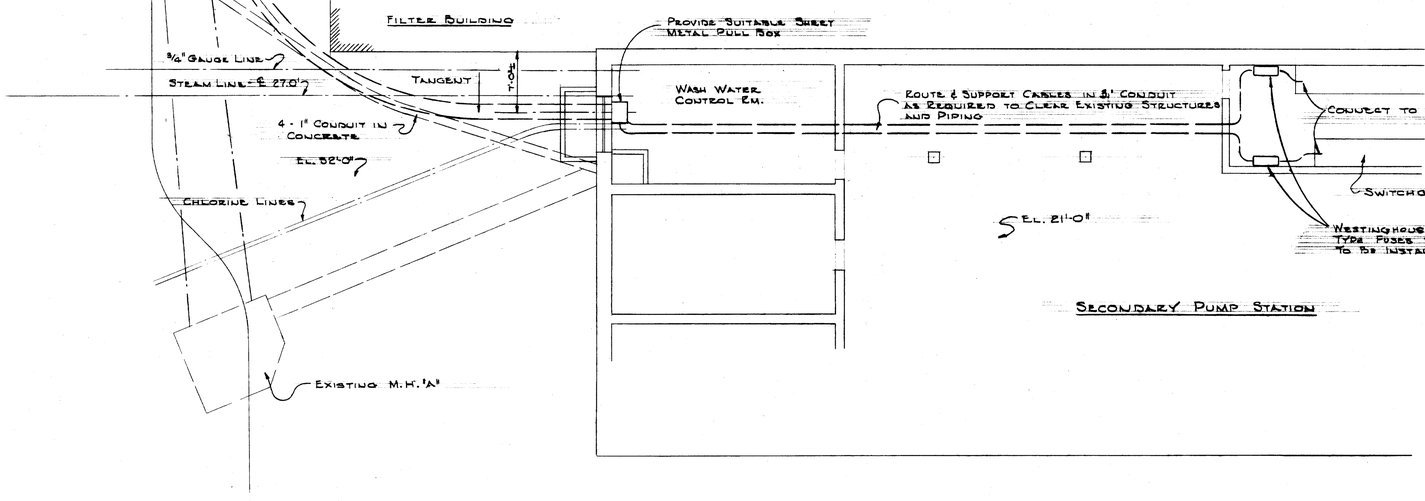


Section B-B
3/8" = 1'-0"



Profile - Duct Bank M.H. #18 to Pump Station
Scales: H 1/8" = 1'-0"
V 1/4" = 1'-0"

Note: If Possible Install Duct Over Steam Line & Electrical Duct But Maintain Minimum Depth of 3'-6".



Plan - 2300v Basin Feeders - Substation to Pump Station
1/8" = 1'-0"

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.

BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI
1953

NO.	DATE	REVISIONS	BY
1	9-1955	As Built Corrections	JDJ

DESIGNED N.A.C. | CHECKED B.E.
DETAILED N.A.C. | APPROVED G.E.H.

JOB NO. 52-340

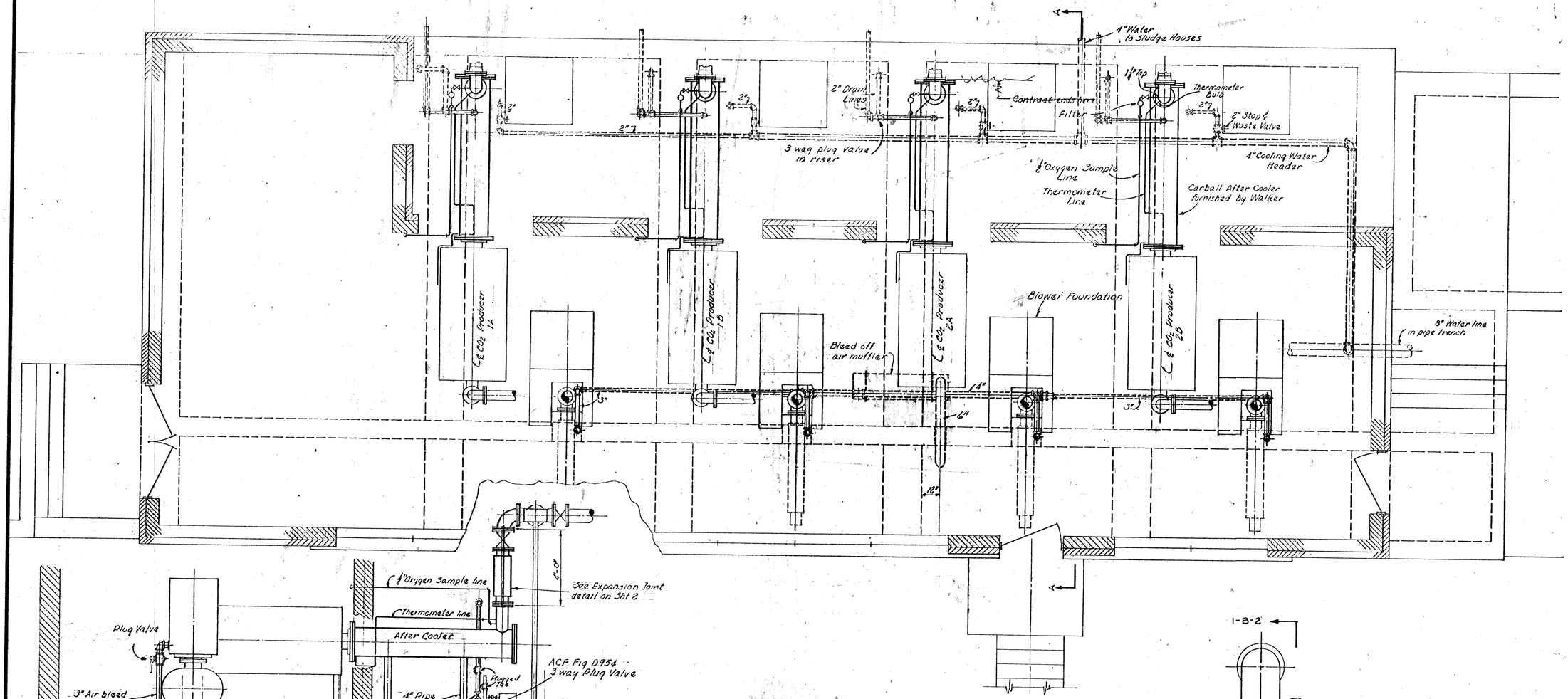
SCALE : AS NOTED

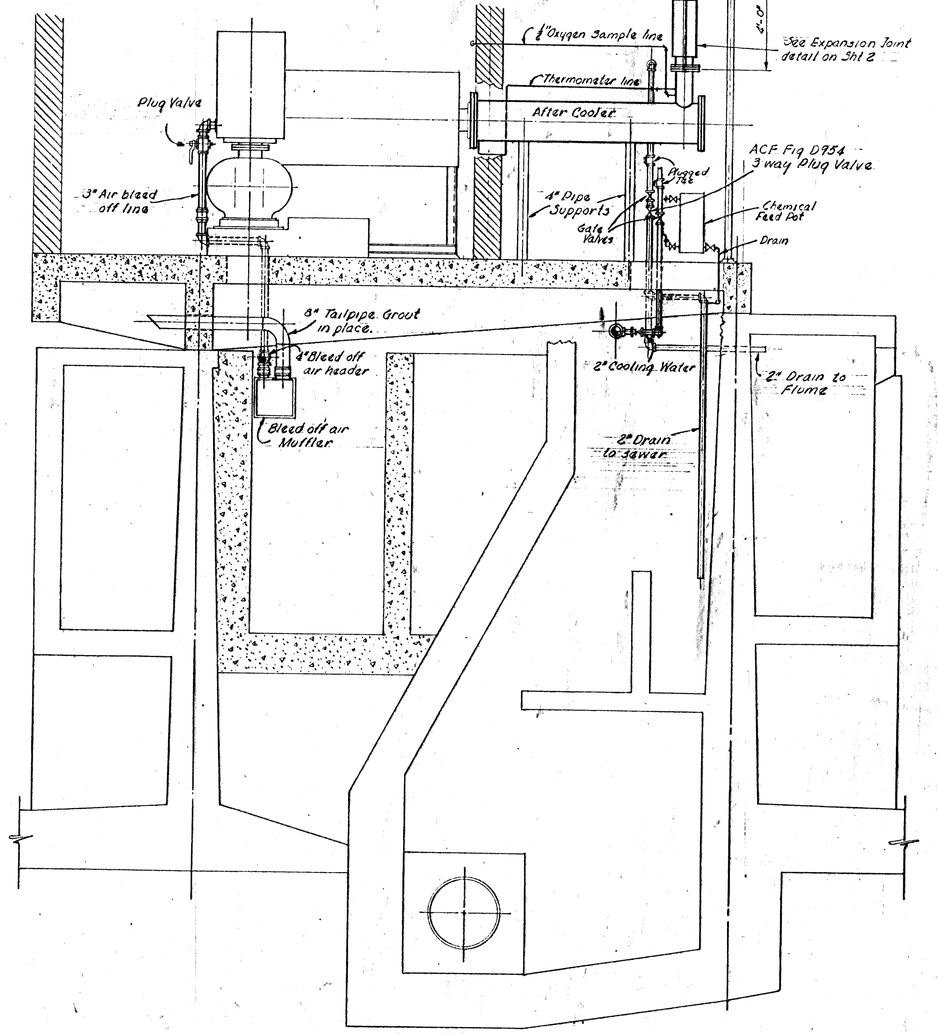
SHEET -REV. 27 -

MICROFILMED

5670-D31A Sh 28/30

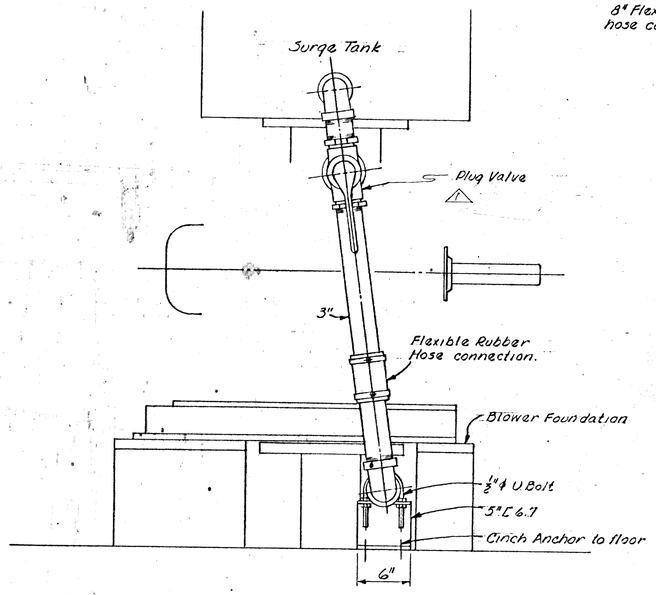
Electrical Circuit Layout



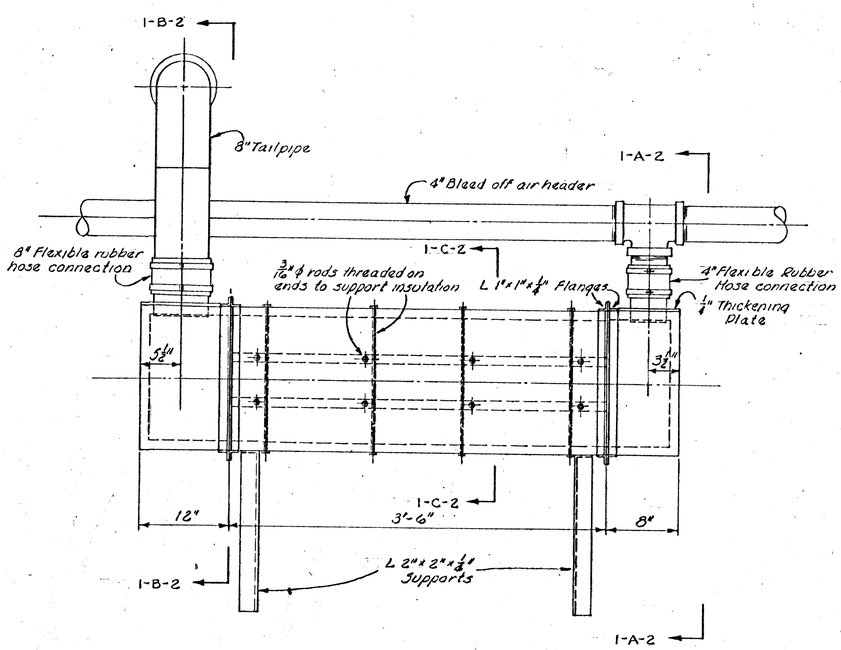


SECTION A-A
Scale: ⅜"=1'-0"

PRODUCER BLDG PIPING PLAN
Scale: ⅜"=1'-0"



FRONT VIEW OF BLOWER BLEED OFF CONNECTIONS
Scale: 1½"=1'-0"



BLEED OFF AIR MUFFLER
Scale: 1½"=1'-0"

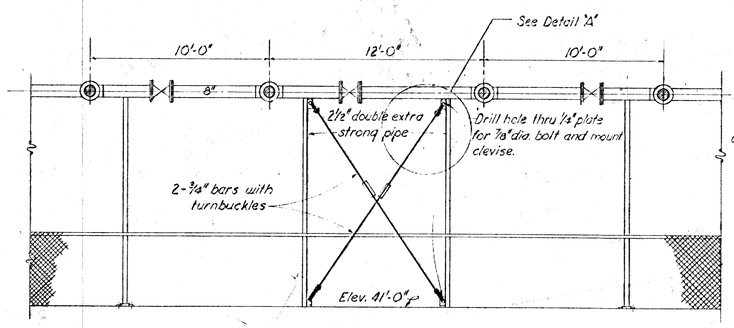
CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.
Miscellaneous Details
BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI

NO.	DATE	REVISIONS	BY
3			
2	10-3-55	As Built Corrections	JDJ
1			

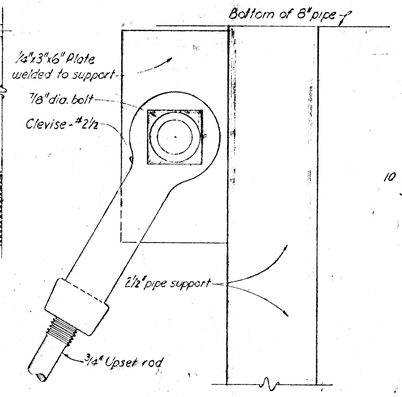
DESIGNED AAZ CHECKED AAZ
DETAILED GAM APPROVED GEH

JOB NO. 52-34D
1954
SCALE 1 AS NOTED
SHEET -REV 28 -

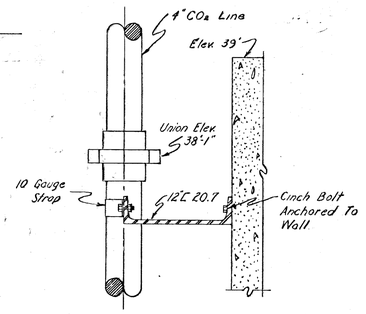
5670-D314 SH 28/30



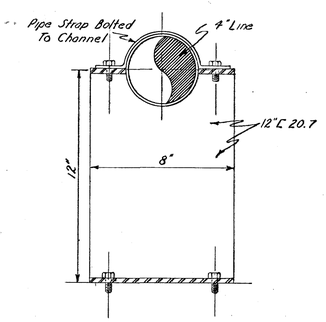
SECTION A-A
Scale: ½"=1'-0"



DETAIL A
Scale: ½"=1'-0"

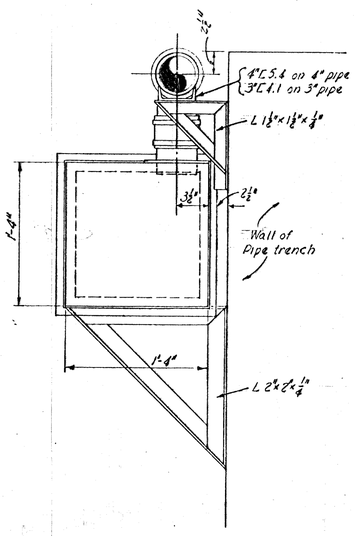


PLAN
Scale: 1½"=1'-0"

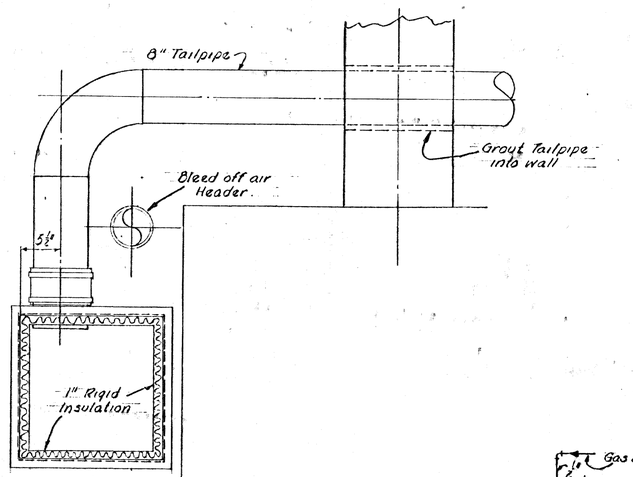


SECTION
Scale: 3"=1'-0"

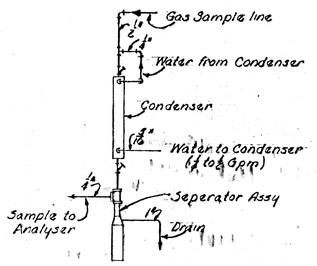
DETAILS OF DIFFUSER RISER GUIDES



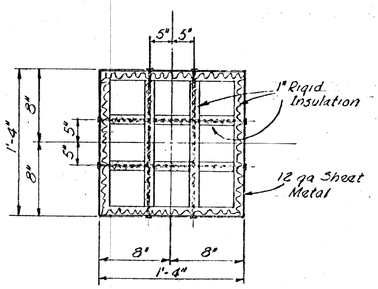
SECTION I-A-2
Scale: 1½"=1'-0"



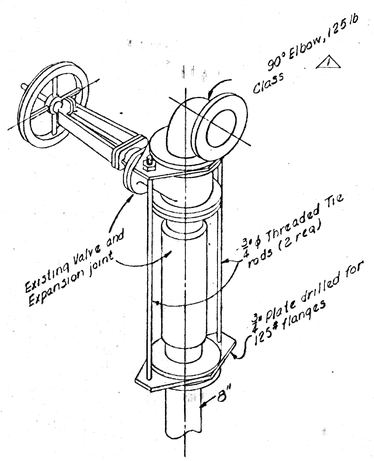
SECTION I-B-2
Scale: 1½"=1'-0"



OXYGEN SAMPLER



SECTION I-C-2
Scale: 1½"=1'-0"



EXPANSION JOINT TIE DOWN
Scale: ¾"=1'-0"

CONTRACT C-109
CONSTRUCTION OF RECARBONATION FACILITIES
WATER WORKS IMPROVEMENTS
AS BUILT KANSAS CITY, MO.
Miscellaneous Details
BURNS & McDONNELL ENGINEERING CO.
KANSAS CITY MISSOURI
1954

NO.	DATE	REVISIONS	BY
1	10-3-58	As Built Corrections	JDV

DESIGNED AAZ CHECKED AAZ
DETAILED GAM APPROVED GEH

JOB NO. 52-340

SCALE 1 AS NOTED

SHEET -REV 29 -

5670-D-31/A SH 30/30

AS BUILT

CONTRACT FOR DESIGN-BUILD SERVICES

This **CONTRACT FOR DESIGN-BUILD SERVICES** ("Agreement") is entered into this _____ day of _____, 20__ ("Agreement Date") by and between the City of Kansas City, Missouri ("Owner") and _____ ("Design-Builder"). In consideration of the mutual covenants and obligations contained herein, Owner and Design-Builder hereby agree as follows:

WITNESSETH:

WHEREAS, on or about _____, Owner issued a Request for Qualifications ("RFQ") soliciting interested parties to submit a Statement of Qualifications ("SOQ") to serve as the design-builder for the Project; and

WHEREAS, on or about _____, Design-Builder submitted its SOQ to Owner; and

WHEREAS, on or about _____, Owner notified Design-Builder that it was one of the shortlisted proposers invited to respond to a Request for Proposals ("RFP"); and

WHEREAS, on or about _____ ("Proposal Submittal Date"), Design-Builder submitted its proposal ("Proposal") in response to the RFP; and

WHEREAS, on or about _____, Owner notified Design-Builder that it was the successful proposer; and

WHEREAS, on or about _____, Owner awarded Design-Builder this Agreement.

NOW, THEREFORE, in consideration of the mutual covenants and obligations contained herein, Owner and Design-Builder hereby agree as follows:

Article 1
The Project

1.1 The Project is generally referred as _____ (Project No. _____), and is specifically defined in the Contract Documents.

Article 2
The Work

2.1 Design-Builder shall complete all Work as specified or indicated in the Contract Documents.

Article 3
Contract Times

3.1 Commencement Date. Design-Builder shall commence the Work upon receipt of the Notice to Proceed ("Commencement Date"). The Commencement Date shall be no later than fifteen (15) days after the Agreement Date, unless the Parties mutually agree otherwise in writing.

DRAFT

3.2 Contract Times

3.2.1 Scheduled Acceptance Date. Acceptance shall be achieved as expeditiously as reasonably practicable, but in no event later than _____ ("Scheduled Acceptance Date").

3.2.2 Scheduled Final Completion Date. Final Completion of the Work shall be achieved as expeditiously as reasonably practicable, but in no event later than sixty (60) days after the Acceptance Date (the last day of such 60-day period being referred to as the "Scheduled Final Completion Date").

3.3 Schedule Adjustments. All of the scheduled completion dates set forth in Section 3.2 above (collectively referred to as "Contract Time(s)") shall be subject to adjustment in accordance with the General Conditions of Contract.

3.4 Time of the Essence. Owner and Design-Builder mutually agree that the Scheduled Acceptance Date and Scheduled Final Completion Date, individually and collectively, are of the essence of this Agreement.

3.5 Delay Liquidated Damages. Design-Builder understands that if any of the Contract Times is not attained, Owner will suffer damages which are difficult to determine and accurately specify. To compensate Owner for such damages, Design-Builder hereby agrees to pay Owner Delay Liquidated Damages as follows:

3.5.1 Acceptance. If the Acceptance Date has not been achieved by the Scheduled Acceptance Date, then Design-Builder shall pay to Owner Delay Liquidated Damages of _____ Dollars ($_____) per day for each day between the Scheduled Acceptance Date and the Acceptance Date.

3.5.2. Final Completion. If the Final Completion Date has not been achieved by the Scheduled Final Completion Date, Designer-Builder shall pay to Owner Delay Liquidated Damages of _____ Dollars ($_____) per day for each day between the Scheduled Final Completion Date and the Final Completion Date.

3.6 Delay Liquidated Damages Not Penalty. The Parties acknowledge, recognize and agree on the following:

(a) that because of the unique nature of the Project, it is difficult or impossible to determine with precision the amount of damages that would or might be incurred by Owner as a result of Design-Builder's failure to complete the Work on or before the applicable Contract Time(s);

(b) that any sums which would be payable under this Agreement as Delay Liquidated Damages are in the nature of liquidated damages, and not a penalty, and are fair and reasonable, and such payment represents a reasonable estimate of fair compensation for the losses that may reasonably be anticipated from such failure;

(c) that any sums which would be payable under this Agreement as Delay Liquidated Damages shall be in lieu of all liability for any and all extra costs, losses, expenses, claims, penalties and any other damages, whether special or consequential, and of whatsoever nature

incurred by Owner which are occasioned by any delay in achieving the applicable Contract Time(s); and

(d) that, in recognition of the acknowledgments above, Design-Builder is expressly estopped from arguing, and waives any rights it may have to argue, that Delay Liquidated Damages are a penalty and that they are not enforceable.

For the avoidance of doubt, and notwithstanding anything to the contrary in Paragraph (c) above, Delay Liquidated Damages are not intended to excuse Design-Builder from liability for any other breach of its obligations under the Contract Documents.

Article 4
Contract Price

4.1 Contract Price. The Contract Price is the sum of _____ ($_____), as set forth in Design-Builder's Cost Proposal (attached hereto as Exhibit 4.1). The Contract Price is subject to adjustments made in accordance with Article 9 of the General Conditions of Contract. Except as specifically provided in this Agreement or the General Conditions of Contract, the Contract Price is deemed to include all sales, consumer, use and other taxes mandated by applicable Legal Requirements in effect as of the Agreement Date, as well as royalties and license fees in connection with the Work.

4.2 Allowance Payment Items and Allowance Payment Values

4.2.1 General. The Contract Price includes all Allowance Payment Items set forth in Exhibit 4.2. The corresponding Allowance Payment Values for the Allowance Payment Items are set forth in Design-Builder's Cost Proposal.

4.2.2 Performance of Work on Allowance Payment Items. No work shall be performed on any Allowance Payment Item without Design-Builder first obtaining in writing advanced authorization to proceed from Owner.

4.2.3 Reconciliation of Allowance Payment Values. If the actual costs for an Allowance Payment Item differ from the stated Allowance Payment Value, the Contract Price shall ultimately be adjusted accordingly by Change Order. If, at the time the Final Application for Payment, the actual costs for any Allowance Payment Value are less than the corresponding Allowance Payment Value, such difference shall be reflected in a Change Order that reduces the Contract Price by such difference.

Article 5
Payment Procedures

5.1 Progress Payments.

5.1.1 Submission. Design-Builder shall submit to Owner on the _____ (__) day of each month, beginning with the first month after the Commencement Date, Applications for Payment in accordance with Article 6 of the General Conditions of Contract.

5.1.2 Payment. Owner shall make payment within thirty (30) days after Owner's receipt of each properly submitted and accurate Application for Payment in accordance with Article 6 of the General Conditions of Contract, but in each case less the total of payments previously made,

and less amounts properly withheld under Section 6.3 of the General Conditions of Contract or otherwise.

5.2 Retainage on Progress Payments.

5.2.1 Retainage. Owner will withhold retainage in the amount of five percent (5%) on progress payments due Design-Builder. After fifty percent (50%) of the total Contract Price has been completed and requisitioned through Applications for Payment, and two and one-half (2.5%) of the Contract Price has been retained, Owner shall cease withholding any retainage from future progress payments owing to Design-Builder hereunder, *provided, however*, that Design-Builder's performance is deemed satisfactory by Owner, in its sole discretion. If Design-Builder is forecasting Acceptance to be forty-five (45) calendar days beyond the Scheduled Acceptance Date, the progress will be considered unsatisfactory and Owner shall resume withholding five percent (5%) of each invoiced amount from future payments until Owner and Design-Builder have agreed upon a plan for mitigating such delay.

5.2.2 Reduction of Retainage. Within thirty (30) days after the Acceptance Date, Owner shall release to Design-Builder all retainage, less an amount equal to: (a) two hundred percent (200%) of the reasonable value of all remaining Punch List items as of the Acceptance Date; and (b) all other amounts Owner is entitled to withhold pursuant to Section 6.3 of the General Conditions of Contract.

5.2.3 Letter of Credit. Design-Builder shall have the right to substitute an irrevocable letter of credit in lieu of cash for all or any portion of the retainage, provided that the letter of credit shall: (a) be a direct pay letter of credit payable immediately upon presentation by Owner, issued by a financial institution, and on a form, approved by Owner in its sole discretion; (b) permit partial draws and be in the amount of one hundred percent (100%) of the required retainage amount, or such lesser amount as Owner agrees in writing from time-to-time to reflect reductions in required retainage; and (c) name Owner as sole payee and beneficiary. Owner shall be entitled to draw upon the letter of credit to provide the requisite cash to satisfy any of Design-Builder's obligations under the Contract Documents. Owner shall further be entitled to draw upon the letter of credit, and hold the proceeds as retainage, if the letter of credit is not renewed or extended at least thirty (30) days prior to its expiration.

5.3 Final Payment. Owner shall pay the outstanding retention at Final Payment, in accordance with Section 6.6 of the General Conditions of Contract.

5.4 Interest. All amounts not paid when due as provided in Article 6 of the General Conditions of Contract shall bear interest in accordance with Mo. Rev. Stat. §34.057, at the rate of one and one-half percent (1.5%) per month.

5.5 Owner's Rights to Offset. Owner shall have the right to withhold Delay Liquidated Damages from any monies unpaid, otherwise due, or to become due, to Design-Builder, to demand and receive payment from Design-Builder of such Delay Liquidated Damages, and to initiate applicable dispute resolution procedures under Article 10 of the General Conditions of Contract to recover such Delay Liquidated Damages. The withholding of such damages from any monies unpaid, otherwise due, or to become due shall be in addition to retainage under the Contract Documents. Owner has the discretion to allow Delay Liquidated Damages to accrue without withholding and by doing so does not waive any rights to withhold them at a later time.

Article 6
Design-Builder's Representations

6.1 Representations. Design-Builder makes the following representations as of the Agreement Date:

(a) Design-Builder examined, carefully studied, and thoroughly understood the RFP Documents, including the Addenda.

(b) Design-Builder has visited the Site and has become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

(c) Design-Builder is familiar with and is satisfied as to all Legal Requirements that may affect cost, progress, or performance of the Work.

(d) Design-Builder has examined, carefully studied, and thoroughly understands: (1) the reports and drawings (if any) of explorations and tests of subsurface conditions at or contiguous to the Site; (2) all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified or made available by Owner; (3) environmental reports; and (4) conditions and restrictions of site access and egress.

(e) Design-Builder is aware of the nature of other work that will be undertaken by Owner's Separate Contractors, and of the relationship of such other work to the Work as indicated in the Project Requirements.

(f) Design-Builder has correlated the Project Requirements with the information known to Design-Builder, information obtained from the geotechnical and environmental reports, observations made during visits to the Site, reports and drawings identified in the RFP Documents, and all additional examinations, investigations, explorations, tests, studies and data made known to Design-Builder.

(g) Design-Builder has given Owner written notice of all conflicts, errors, ambiguities, or discrepancies that Design-Builder has discovered in the RFP Documents as of the Agreement Date and the written resolution thereof by Owner is acceptable to Design-Builder.

(h) The RFP Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

(i) Design-Builder shall be bound by and shall perform its obligations in full compliance with the Contract Documents.

Article 7
Insurance and Bonds

7.1 Insurance.

7.1.1 Insurance Requirements. Design-Builder shall procure and maintain the insurance required by Exhibit 7.1.

7.1.2 Evidence of Insurance. No later than seven (7) days after the Agreement Date,

Design-Builder shall deliver to Owner the certificates, endorsements, and other evidence of insurance required to be provided by Design-Builder in accordance with Section 5.1.3(a) of the General Conditions.

7.2 Performance and Payment Bonds.

7.2.1 Provision of the Bonds. No later than seven (7) days after the Agreement Date, Design-Builder shall deliver to Owner:

(a) a Performance Bond in the penal amount equal to one hundred percent (100%) of the Contract Price, which bond shall cover the faithful performance of all Design-Builder's obligations under the Contract Documents (the "Performance Bond"); and

(b) a Payment Bond in the penal amount equal to one hundred percent (100%) of the Contract Price (the "Payment Bond").

7.2.2 Surety Rating. The surety for the Performance and Payment Bonds shall: (a) have a rating of A- or better in the latest revision of the A.M. Best Owner's Insurance Report; (b) be authorized by law to do business in Missouri; and (c) be listed in the most recent U.S. Department of Treasury Circular 570.

7.2.3 Form of Bonds. The Performance Bond shall be in the form set forth in Exhibit 7.2.3(a) and the Payment Bond shall be in the form set forth in Exhibit 7.2.3(b).

7.2.4 Duration of Performance Bond. The Performance Bond shall remain valid for a period of two (2) years after Final Completion.

Article 8
Contract Documents

8.1 Contract Documents. The Contract Documents consist of the documents listed below:

1. This Agreement and all of the Exhibits;

2. General Conditions of Contract;

3. Attachment A (Project Requirements);

4. Addenda numbers __ through __ inclusive, to the extent such Addenda modify the other Contract Documents; and

5. Elements of Design-Builder's Technical Proposal (*to be identified and agreed upon*).

6. The following, which shall be designated, completed, delivered, prepared, or issued after the Agreement Date and are not attached hereto:

   (a) The Released for Construction Documents.

(b) Any and all written amendments, Change Orders, Work Change Directives, and Minor Changes amending, modifying, or supplementing the Contract Documents.

8.2 Amending the Contract Documents. The Contract Documents may only be amended, modified, or supplemented through a written amendment executed by the Parties or a Change Order, Work Change Directive, or Minor Change issued in accordance with Article 9 of the General Conditions of Contract.

8.3 Order of Precedence of the Contract Documents. The Contract Documents comprise the entire agreement between Owner and Design-Builder governing the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the laws of the State of Missouri. The following order of precedence shall apply in the case of direct, irresolvable conflicts between or among Contract Documents:

1. Written amendments and Change Orders
2. Work Change Directives
3. Minor Changes
4. This Agreement, and all of the Exhibits except for Exhibit 8.3 (Elements of Design-Builder's Technical Proposal).
5. The General Conditions of Contract
6. Released for Construction Documents
7. Attachment A (Project Requirements)
8. Exhibit 8.3 (Elements of Design-Builder's Technical Proposal)

8.4 Exceptions to the Order of Precedence. Notwithstanding the order of precedence set forth in Section 8.3 above, the betterments and higher and/or more stringent standards or specifications and design and construction criteria, concepts, and drawings contained in Exhibit 8.3 (Elements of Design-Builder's Technical Proposal) shall supersede the applicable requirements of the Project Requirements and shall apply to the performance of the Work.

Article 9
Miscellaneous

9.1 Defined Terms. Terms used in this Agreement will have the meanings indicated in the General Conditions of Contract.

9.2 Notice. Whenever the Contract Documents require that notice be provided to the other Party, notice will be deemed to have been validly given: (a) if delivered in person to the individual intended to receive such notice; or (b) four (4) days after being sent by registered or certified mail, postage pre-paid, with return receipt requested, to the address indicated in the Agreement, or (c) one (1) business day after being sent by overnight delivery via a nationally recognized courier

service (e.g., FedEx or UPS), postage, transmittal or shipping charges prepaid, to the addresses set forth below:

If to Design-Builder:	If to Owner:
_____	_____
_____	_____
_____	_____

9.3 Consequential Damages.

9.3.1 Waiver. To the fullest extent permitted by law, and notwithstanding any other provision of the Contract Documents other than those set forth in Section 9.3,2, in no event, whether arising out of contract, breach of warranty (express or implied), tort (including negligence), strict liability, indemnity, contribution, or any other cause of or form of action whatsoever, shall either Party be liable to the other for any consequential, incidental, indirect, special, exemplary, or punitive damages (including damages for loss of use, loss of profits or anticipated profits, loss of revenue or anticipated revenue, loss of goodwill, claims from Owner's customers, borrowing or financing, productivity or shop space, increased cost of capital, punitive damages, and loss of business opportunity) arising out of or in connection with the performance or non-performance of its obligations under the Contract Documents.

9.3.2 Exceptions to Waiver. The waiver of consequential damages set forth in Section 9.3.1 above shall not be deemed to affect or waive:

(a) Design-Builder's obligation to pay Delay Liquidated Damages in accordance with Section 3.5 above;

(b) Design-Builder's liability for fraud, fraudulent misrepresentation, intentional misconduct, Gross Negligence, or criminal acts of Design-Builder or any DB-Related Entity;

(c) Design-Builder's liability for its indemnity obligations under Article 7 of the General Conditions of Contract; and

(d) Design-Builder's liability for any loss, cost, or expense to the extent such loss, cost or expense is paid by the proceeds of insurance (excluding payment of deductibles) up to the specific amounts Design-Builder is required to carry under Exhibit 7.1 to this Agreement.

9.3.3 Binding on Other Persons and Entities. The provisions of this Section 9.3: (a) shall be binding on and extend to the benefit of all successors, assignees, employees, officers, directors and Affiliates of each Party; and (b) except to the extent prohibited by applicable Legal Requirements or specific terms to the contrary in this Section 9.3, shall apply even in the event of the fault, negligence (in whole or in part), tort, strict liability, breach of contract or otherwise, of the person or entity in whose favor such provisions operate.

9.4 Alternative Technical Concepts. The accepted Alternative Technical Concepts ("ATCs"), as set forth in Design-Builder's Technical Proposal, are intended to modify and/or replace, as applicable, the Project Requirements. Design-Builder acknowledges that Owner's acceptance of

such ATCs is not intended to shift any risk or responsibility to Owner in the event that any ATC fails to be available (e.g., Equipment or Material that is unavailable from a Supplier), fails to perform as proposed by Design-Builder, or is otherwise not able to be used. In such event, Design-Builder shall, at its sole cost and expense, and without any adjustment to the Contract Price or Contract Times, perform the Work as originally required by the Project Requirements (i.e., prior to the modification and/or replacement of the Project Requirements to account for the ATC), or as required to produce a result that is reasonably acceptable to Owner.

9.5 Self-Performance Requirements. Design-Builder shall perform with its own organization, or an Affiliate of Design-Builder, not less than _____ percent (__%) of the total Contract Price. The dollar value included in the above percentage shall include the value of labor, Equipment and Materials directly performed or procured by Design-Builder or its Affiliate and shall not include the value of work performed or provided by Design Consultants or Subcontractors.

9.6 MBE/WBE Requirements. Owner has adopted a Minority/Women Business Enterprise ("MBE/WBE") Program (Sections 3-421 through 3-469, Code of Ordinances). Design-Builder shall comply with all MBE/WBE requirements set forth in such Program in performing its obligations under the Contract Documents.

9.7 Workforce Program and Prevailing Wage Requirements

9.7.1 Workforce Program Requirements. Owner has adopted a Construction Employment ("Workforce") Program (Sections 3-501 through 3-525, Code of Ordinances). Design-Builder shall comply with all Workforce requirements set forth in such Program in performing its obligations under the Contract Documents.

9.7.2 Prevailing Wages. Design-Builder shall comply and require each of its Subcontractors to comply with:

(a) Sections 290.210 to 290.340, RSMO the State of Missouri Prevailing Wage Law (the "Law");

(b) 8 CSR 30-3.010 to 8 CSR 30-3.060, the Prevailing Wage Law Rules (the "Rules");

(c) The Annual Wage Order (the "Wage Order") issued by the State of Missouri's Department of Labor and Industrial Relations; and

(d) Any applicable Annual Incremental Wage Increase (the "Wage Increase") to the Annual Wage Order.

The Law, Rules, Annual Wage Order and any Wage Increase are incorporated into and made part hereof the Contract Documents and shall be collectively referred to in this Section 9.7.2 as the "Prevailing Wage Requirements." Design-Builder shall pay and require each of its Subcontractors to pay to all workers performing the Work not less than the prevailing hourly rate of wages for the class or type of work performed by the worker in accordance with the Prevailing Wage Requirements. Design-Builder shall take whatever steps are necessary to insure that the prevailing hourly wage rates are paid and that all workers for Design-Builder and each of its Subcontractors are paid for the class or type of work performed by the worker in accordance with the Prevailing Wage Requirements. If Design-Builder shall fail to start to perform Design-Builder's obligations under the Contract Documents within sixty (60) days from the Agreement Date,

Design-Builder and each of its Subcontractors shall be obligated to pay all workers in accordance with any new Wage Order, as subsequently amended by any applicable Wage Increase, issued by the Department of Labor and Industrial Relations within the aforementioned sixty (60) day period. The new Wage Order and any applicable Wage Increase shall govern notwithstanding the fact that the Wage Order being replaced might be physically attached or incorporated in the Contract Documents.

9.8 Attachments and Exhibits. The following attachments ("Attachments") and exhibits ("Exhibits") are specifically made part of, and incorporated by reference into, this Agreement:

Attachment A	Project Requirements
Exhibit 4.1	Design-Builder's Cost Proposal
Exhibit 7.1	Insurance Requirements
Exhibit 7.2.3(a)	Form of Performance Bond
Exhibit 7.2.3(b)	Form of Payment Bond
Exhibit 8.3	Elements of Design-Builder's Technical Proposal
Exhibit 9.8(a)	Mobilization and Engineering Schedule
Exhibit 9.8(b)	Proposed Baseline Schedule
Exhibit 9.8(c)	Schedule of Values for Mobilization and Engineering
Exhibit 9.8(d)	List of Key Personnel

IN WITNESS WHEREOF, Owner and Design-Builder have signed this Agreement in duplicate. One counterpart each has been delivered to Owner and Design-Builder.

OWNER:

City of Kansas City, Missouri

_____
(Signature)

_____
(Printed Name)

_____
(Title)

Date: _____

DESIGN-BUILDER:

_____
(Name of Design-Builder)

_____
(Signature)

_____
(Printed Name)

_____
(Title)

Date: _____

DRAFT

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Project Number: **80002542 / C9909**

Project Title: **WTP – House Service Main**

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BIDDING REQUIREMENTS

00410	Design-Build Bid Form	Attachment G – Cost Proposal Forms
00430	Bid Bond	Attachment G – Cost Proposal Forms
00435	Alternative Technical Concepts	Attachment G – Cost Proposal Forms

CIVIL RIGHTS and EQUAL OPPORTUNITY (CREO) DOCUMENTS

	CREO Form 06: HRD Instructions for Requests for Qualifications/Proposals	Attachment H – Submission Forms
00450	CREO Form 08: Contractor Utilization Plan/Request for Waiver	Attachment H – Submission Forms
00450.01	CREO KC Letter of Intent to Subcontract	Attachment H – Submission Forms
00460	CREO KC Form 10: Timetable for MBE/WBE Utilization	Attachment H – Submission Forms
00470	CREO KC Form 11: Request for Modification or Substitution	Attachment C – Draft Contract for DB Services
00485	CREO Monthly Reporting Instructions	Attachment H – Submission Forms
00485.04	CREO Employee Identification Report Form	Attachment H – Submission Forms
00485.05	CREO KC Affidavit of Training Program	Attachment H – Submission Forms

CONTRACTING REQUIREMENTS

00001a	Draft Contract for Design-Build Services	Attachment C – Draft Contract for DB Services
DB 00700	Design-Build General Conditions	Attachment C – Draft Contract for DB Services
DB 00800	Design-Build Supplementary Conditions	Attachment C – Draft Contract for DB Services
00490	Pre-Contract Bidder's Certification Form	Attachment H – CREO Forms
00515.01	Employee Eligibility Verification Affidavit	Attachment H – CREO Forms
00560	Missouri Project Exemption Certificate	Attachment C – Draft Contract for DB Services
00560.01	Kansas City Missouri Tax Exempt Certificate	Attachment C – Draft Contract for DB

		Services
00610	Performance and Maintenance Bond Form	Attachment C – Draft Contract for DB Services
00615	Payment Bond Form	Attachment C – Draft Contract for DB Services
00620	Insurance Certificate	Attachment C – Draft Contract for DB Services
00630	Revenue Clearance Release Authorization	Attachment C – Draft Contract for DB Services
00830	Wage Rate Requirements – Clay County	Attachment C – Draft Contract for DB Services
00910	Construction Addenda	Attachment C – Draft Contract for DB Services
00930	Request for Interpretation Form	Attachment C – Draft Contract for DB Services
00930.01	Request for Interpretation Log	Attachment C – Draft Contract for DB Services
00931	Supplemental Design Instructions	Attachment C – Draft Contract for DB Services
00932	Request for Proposal	Attachment C – Draft Contract for DB Services
00940	Change Order Form	Attachment C – Draft Contract for DB Services
00945	Work Change Directive	Attachment C – Draft Contract for DB Services

PROJECT REQUIRMENTS

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01021	Operation and Maintenance Data	Attachment B – Scope of DB Services
01110	Summary of Work	Attachment B – Scope of DB Services
01140	Work Restrictions	Attachment B – Scope of DB Services
01140.01	Process and System Shutdown Constraints Schedule	Attachment B – Scope of DB Services
01140.02	Operational Change Control Plan Documents	Attachment B – Scope of DB Services
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01290.02	Schedule of Values	Attachment B – Scope of DB Services
01290.03	Certified Payroll Report Instructions	Attachment B – Scope of DB Services
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01290.09	Subcontractors and Major Material Suppliers List	Attachment B – Scope of DB Services

01290.11	Daily Labor Force Report	Attachment B – Scope of DB Services
01290.12	Certificate of Substantial Completion	Attachment B – Scope of DB Services
01290.13	Punch List	Attachment B – Scope of DB Services
01290.14	Contractor Affidavit for Final Payment	Attachment B – Scope of DB Services
01290.15	Subcontractor Affidavit for Final Payment	Attachment B – Scope of DB Services
01300	Submittals	Attachment B – Scope of DB Services
01320	Construction Progress Documentation	Attachment B – Scope of DB Services
01320.01	Daily Field Observation Report	Attachment B – Scope of DB Services
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01320.03	Weekly Report of Working Days	Attachment B – Scope of DB Services
01322	Photographic Documentation	Attachment B – Scope of DB Services
01329	Safety Plan	Attachment B – Scope of DB Services
01330.01	Letter of Transmittal	Attachment B – Scope of DB Services
01335	Document Management	Attachment B – Scope of DB Services
01340	Project BIM Coordination	Attachment B – Scope of DB Services
01340.A	Attribute Standard	Attachment B – Scope of DB Services
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01354	Hazardous Material Procedures	Attachment B – Scope of DB Services
01400	Quality Control	Attachment B – Scope of DB Services
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01433	Manufacturer’s Field Service	Attachment B – Scope of DB Services
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01570.SWPP	Temp Erosion	Attachment B – Scope of DB Services
01580	Project Signs	Attachment B – Scope of DB Services
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01600	Product Delivery Storage and Handling	Attachment B – Scope of DB Services
01615	Equipment Identification and Tagging	Attachment B – Scope of DB Services
01630	Substitution Request	Attachment B – Scope of DB Services
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01700.C	Traffic control Application	Attachment B – Scope of DB Services
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01810	Project Design Criteria	Attachment F – Project Design Criteria
Form F-1	80002542 – Proj. Dgn. Specifications	Attachment F – Project Design Criteria

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DIV 2	Division 2 specifications not listed in Table of Contents	https://www.kcwater.us/projects/rulesandregulations/
02821	Fences and Gates	Attachment E – Technical Requirements
03000	Concrete	Attachment E – Technical Requirements
03100	Concrete Forms and Accessories	Attachment E – Technical Requirements
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15110	Process Valves	Attachment E – Technical Requirements
15200	Pipe & Fittings	Attachment E – Technical Requirements
15200.75PVC	PVC Pipe & Fittings	Attachment E – Technical Requirements
15200.150CS	ANSI 150 Carbon Steel Pipe & Fittings	Attachment E – Technical Requirements
15200.150DI	Ductile Iron Pipe & Fittings	Attachment E – Technical Requirements
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PROJECT BACKGROUND INFORMATION

D.1	Water Treatment Plant Basemap	Attachment D – Project Background Documents
D.2	Pipe Gallery Demo	Attachment D – Project Background Documents
D.3	16841 - Rehabilitation of Natural Gas, Fuel Oil, Water and Carbon Dioxide Piping at the Water Treatment Plant	Attachment D – Project Background Documents
D.4	5672 - New Final Basin No. 3 – Contract C-125	Attachment D – Project Background Documents
D.5	5670 - Recarbonation Facilities – Contract C-109	Attachment D – Project Background Documents

REQUEST FOR MODIFICATION OR SUBSTITUTION

*(This Form **must** be submitted to CREO KC to request substitutions for an MBE/WBE listed in the Contractor Utilization Plan or for modification of the amount of MBE/WBE participation listed in the Contractor Utilization Plan. This Form shall be an amendment to the Contractor Utilization Plan.)*

BIDDER/PROPOSER/CONTRACTOR: _____
ADDRESS: _____
PROJECT NUMBER OR TITLE: _____
AMENDMENT/CHANGE ORDER NO: (if applicable) _____

Project Goals:	_____% MBE	_____% WBE
Contractor Utilization Plan:	_____% MBE	_____% WBE

1. I am the duly authorized representative of the above Bidder/Contractor/Proposer and am authorized to request this substitution or modification on behalf of the Bidder/Contractor/Proposer.

2. I hereby request that the Director of CREO KC recommend or approve: (check appropriate space(s))

   a. ☐ A substitution of the certified MBE/WBE firm _____,
   (Name of new firm)
   to perform _____,
   (Scope of work to be performed by new firm)

   for the MBE/WBE firm _____ which is currently
   (Name of old firm)
   listed on the Bidder's/Contractor's/Proposer's Contractor Utilization Plan to

   perform the following scope of work: _____.
   (Scope of work of old firm)

   b. ☐ A modification of the amount of MBE/WBE participation currently listed on the Bidder's/Contractor's/Proposer's Contractor Utilization Plan from

   _____ % MBE_____% WBE *(Fill in % of MBE/WBE Participation currently listed on Contractor Utilization Plan)*

   TO

   _____% MBE _____% WBE *(Fill in New % of MBE/WBE Participation requested for Contractor Utilization Plan)*

   c. Attach 00450.01 Letter of Intent to Subcontract letter for each new MBE/WBE to be added.
   d. Attach a copy of the most recent 00485.01 or on-line M/WBE Monthly Utilization Report

3. Bidder/Contractor/Proposer states that a substitution or modification is necessary because: (check applicable reason(s))

☐ The MBE/WBE listed on the Contractor Utilization Plan is non-responsive or cannot perform.

☐ The MBE/WBE listed on the Contractor Utilization Plan has increased its previously quoted price without a corresponding change in the scope of work.

☐ The MBE/WBE listed on the Contractor Utilization Plan has committed a material default or breach of its contract.

☐ Requirements of the scope of work of the contract have changed and make subcontracting not feasible or not feasible at the levels required by the goals established for the contract.

☐ The MBE/WBE listed on the Contractor Utilization Plan is unacceptable to the City contracting department.

☐ Bidder/Contractor/Proposer has not attempted intentionally to evade the requirements of the Act and it is in the best interests of the City to allow a modification or substitution.

4. The following is a narrative summary of the Bidder's/Contractor's/Proposer's good faith efforts exhausted in attempts to substitute the MBE/WBE firm named above which is currently listed on the Contractor Utilization Plan with other qualified, certified MBE/WBE firms for the listed scope of work or any other scope of work in the project:

5. Bidder/Proposer/Contractor will present documentation when requested by the City to evidence its good faith efforts.

Dated:_____ _____
(Bidder/Proposer/Contractor)

_____
By: (Authorized Representative)

Reset Form Print Form

MISSOURI DEPARTMENT OF REVENUE
CUSTOMER SERVICES DIVISION

PROJECT EXEMPTION CERTIFICATE

FORM **5060** (REV. 1-2008)

TO BE GIVEN TO YOUR CONTRACTOR

NAME OF EXEMPT ENTITY ISSUING THE CERTIFICATE		MISSOURI TAX EXEMPTION NUMBER	
ADDRESS	CITY	STATE	ZIP
BEGIN DATE FOR PROJECT	PROJECTED COMPLETION DATE	PROJECT NUMBER	

DESCRIPTION OF PROJECT

PROJECT LOCATION	EXPIRATION DATE

THIS EXEMPTION DOES NOT APPLY TO THE PURCHASE OR RENTAL OF MACHINERY, EQUIPMENT, OR TOOLS BY THE CONTRACTOR OR SUB-CONTRACTOR.

Give a signed copy of this certificate, along with a copy of your Missouri Sales/Use Tax Exemption Letter to each contractor and/or subcontractor who will be purchasing tangible personal property for use in this project. It is your responsibility to ensure the validity of the certificate. You must issue a new certificate if any of the information changes.

EXEMPT ENTITY'S AUTHORIZED SIGNATURE	DATE

The Missouri exempt entity named above hereby authorizes the purchase, without sales tax, of tangible personal property to be incorporated or consumed in the construction project identified herein and no other, pursuant to Section 144.062, RSMo. I also declare under penalties of perjury that I employ no illegal or unauthorized aliens as defined under federal law and that I am not eligible for any tax exemption, credit or abatement if I employ such aliens.

NAME OF PURCHASING CONTRACTOR

ADDRESS	CITY	STATE	ZIP

Contractors present this to your supplier in order to purchase the necessary materials tax exempt.

NOTE: COMPLETE AND SIGN BOTTOM PORTION IF EXTENDING CERTIFICATE TO YOUR SUBCONTRACTOR.

NAME OF PURCHASING SUBCONTRACTOR

ADDRESS	CITY	STATE	ZIP

SIGNATURE OF CONTRACTOR	DATE

This publication is available upon request in alternative accessible format(s).

State of Missouri

EXEMPTION FROM MISSOURI SALES AND USE TAX ON PURCHASES

Issued to:

CITY OF KANSAS CITY
414 E 12TH ST 3RD FLOOR
KANSAS CITY MO 64106

Missouri Tax ID Number: 12490466

Effective Date: 07/11/2002

Your application for sales/use tax exempt status has been approved pursuant to Section 144.030.1, RSMo. This letter is issued as documentation of your exempt status.

Purchases by your Agency are not subject to sales or use tax if within the conduct of your Agency's exempt functions and activities. When purchasing with this exemption, furnish all sellers or vendors a copy of this letter. This exemption may not be used by individuals making personal purchases.

A contractor may purchase and pay for construction materials exempt from sales tax when fulfilling a contract with your Agency only if your Agency issues a project exemption certificate and the contractor makes purchases in compliance with the provisions of Section 144.062, RSMo.

Sales by your Agency are subject to all applicable state and local sales taxes. If you engage in the business of selling tangible personal property or taxable services at retail, you must obtain a Missouri Retail Sales Tax License and collect and remit sales tax.

This is a continuing exemption subject to legislative changes and review by the Director of Revenue. If your Agency ceases to qualify as an exempt entity, this exemption will cease to be valid. This exemption is not assignable or transferable. It is an exemption from sales and use taxes only and is not an exemption from real or personal property tax.

Any alteration to this exemption letter renders it invalid.

If you have any questions regarding the use of this letter, please contact the Division of Taxation and Collection, P.O. Box 3300, Jefferson City, MO 65105-3300, phone 573-751-2836.

(DI6030)

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

PERFORMANCE AND MAINTENANCE BOND

Project/Contract Numbers: 81000500/1626

Project Title: Birmingham Headworks and Electrical Improvements

KNOW ALL MEN BY THESE PRESENTS: That _____, as PRINCIPAL (CONTRACTOR), and _____, (SURETY), licensed to do business as such in the State of Missouri, hereby bind themselves and their respective heirs, executors, administrators, successors, and assigns unto Kansas City, Missouri, a constitutionally chartered municipal corporation, (OWNER), as obligee, in the penal sum of _____ Dollars ($ _____) for the payment whereof CONTRACTOR and SURETY bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

CONTRACTOR has entered into a Contract with OWNER for **Project/Contract Numbers 81000500/1626, Birmingham Headworks and Electrical Improvements**, which Contract, including any present or future amendment thereto, is incorporated herein by reference and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if CONTRACTOR shall promptly and faithfully perform said Contract including all duly authorized changes thereto, and including any maintenance requirements contained therein, according to all the terms thereof, including those under which CONTRACTOR agrees to pay legally required wage rates including the prevailing hourly rate of wages in the locality, as determined by the Department of Labor and Industrial Relations or by final judicial determination, for each craft or type of workman required to execute the Contract and, further, shall defend, indemnify, and hold harmless OWNER from all damages, including but not limited to, liquidated damages, loss and expense occasioned by any failure whatsoever of said CONTRACTOR and SURETY to fully comply with and carry out each and every requirement of the Contract, then this obligation shall be void; otherwise, it shall remain in full force and effect.

WAIVER. That SURETY, for value received, hereby expressly agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder, shall in any way affect the obligations of this Bond; and it does hereby waive notice of any such change, extension of time, or alteration or addition to the terms of the Contract or the Work to be performed thereunder.

IN WITNESS WHEREOF, the above parties have executed this instrument the ____ day of _____, 20__.

CONTRACTOR
Name, address and facsimile number of Contractor

_____
_____
_____
_____

I hereby certify that I have authority to execute
this document on behalf of Contractor.

By: _____
Title: _____

(Attach corporate seal if applicable)

SURETY
Name, address and facsimile number of Surety:

_____
_____
_____
_____

I hereby certify that (1) I have authority to execute this document on behalf of Surety; (2) Surety has an A.M. Best rating of A-, V, or better; (3) Surety is named in the current list of "Companies Holding Certificates of Authority as Acceptable Reinsuring Companies: as published in Circular 570 (most current revision) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury; and (4) Surety is duly licensed to issue bonds in the State of Missouri and in the jurisdiction in which the Project is located.

By:_____
Title:_____
Date:_____

(Attach seal and Power of Attorney)

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

PAYMENT BOND

Project/Contract Numbers: 81000500/1626

Project Title: Birmingham Headworks and Electrical Improvements

KNOW ALL MEN BY THESE PRESENTS: That _____, as PRINCIPAL (CONTRACTOR), and_____, (SURETY), licensed to do business as such in the State of Missouri, hereby bind themselves and their respective heirs, executors, administrators, successors, and assigns unto Kansas City, Missouri, a constitutionally chartered municipal corporation, (OWNER), as obligee, in the penal sum of _____ Dollars ($_____) for the payment whereof CONTRACTOR and SURETY bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

CONTRACTOR has entered into a contract with OWNER for **Project/Contract Numbers 81000500/1626, Birmingham Headworks and Electrical Improvements**, which Contract, including any present or future amendment thereto, is incorporated herein by reference and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if in connection with the Contract, including all duly authorized modifications thereto, prompt payment shall be made to all laborers, subcontractors, teamsters, truck drivers, owners or other suppliers or for equipment employed on the job, and other claimants, for all labor performed in such work whether done for CONTRACTOR, a subcontractor, SURETY, a completion contractor or otherwise (at the full wage rates required by any law of the United States or of the State of Missouri, where applicable), for services furnished and consumed, for repairs on machinery, for equipment, tools, materials, lubricants, oil, gasoline, water, gas, power, light, heat, oil, telephone service, grain, hay, feed, coal, coke, groceries and foodstuffs, either consumed, rented, used or reasonably required for use in connection with the construction of the work or in the performance of the Contract and all insurance premiums, both for compensation and for all other kinds of insurance on the work, for sales taxes and for royalties in connection with, or incidental to, the completion of the Contract, in all instances whether the claim be directly against CONTRACTOR, against SURETY or its completion contractor, through a subcontractor or otherwise, and, further, if CONTRACTOR shall defend, indemnify and hold harmless OWNER from all such claims, demands or suits by any such person or entity, then this obligation shall be void; otherwise, it shall remain in full force and effect.

Any conditions legally required to be included in a Payment Bond on this Contract, including but not limited to those set out in §107.170 RSMo.are included herein by reference.

SURETY agrees that, in the event that CONTRACTOR fails to make payment of the obligations covered by this Bond, it will do so and, further, that within forty-five (45) days of receiving, at the address given below, a claim hereunder stating the amount claimed and the basis for the claim in reasonable detail, it (a) will send an answer to the claimant, with a copy to OWNER stating the amounts that are undisputed and the basis for challenging any amounts that are disputed, and (b) will pay any amounts that are undisputed. The amount of this Bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder.

While this Bond is in force, it may be sued on at the instance of any party to whom any such payment is due, in the name of OWNER to the use for such party. OWNER shall not be liable for the payment of any costs or expenses of any such suit.

No suit shall be commenced or pursued hereunder other than in a state court of competent jurisdiction in Jackson, Clay or Platte County, Missouri, or in the United States District Court for the Western District of Missouri.

WAIVER. That SURETY, for value received, hereby expressly agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder, shall in any way affect the obligations of this Bond; and it does hereby waive notice of any such change, extension of time, or alteration or addition to the terms of the Contract or the Work to be performed thereunder.

IN WITNESS WHEREOF, the above parties have executed this instrument the _____ day of_____ _____, 20____.

CONTRACTOR
Name, address and facsimile number of Contractor

_____
_____
_____
_____

I hereby certify that I have authority to execute this document on behalf of Contractor.

By: _____
Title:_____

(Attach corporate seal if applicable)

SURETY
Name, address and facsimile number of Surety:

_____
_____
_____
_____

I hereby certify that (1) I have authority to execute this document on behalf of Surety; (2) Surety has an A.M. Best rating of A-. or better; (3) Surety is named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (most current revision) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury; and(4) Surety is duly licensed to issue bonds in the State of Missouri and in the jurisdiction in which the Project is located.

By:_____
Title:_____
Date:_____

(Attach seal and Power of Attorney)

ACORD®

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:
AGENT NAME AND ADDRESS	PHONE (A/C, No, Ext): / FAX (A/C, No):
	E-MAIL ADDRESS:
	INSURER(S) AFFORDING COVERAGE / NAIC #
	INSURER A : ABC INSURANCE COMPANY
INSURED	INSURER B :
CONTRACTOR NAME AND ADDRESS	INSURER C :
	INSURER D :
	INSURER E :
	INSURER F :

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	GENERAL LIABILITY ☑ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☑ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☑ PRO-JECT ☐ LOC	Y	Y	POLICY NUMBER	1/1/2011	Current	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG $	$ 1,000,000 $ 50,000 $ 10,000 $ 1,000,000 $ 2,000,000 $ 2,000,000 $
A	AUTOMOBILE LIABILITY ☑ ANY AUTO ALL OWNED AUTOS ☐ SCHEDULED AUTOS ☑ HIRED AUTOS ☑ NON-OWNED AUTOS	Y	Y	POLICY NUMBER	1/1/2011	Current	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) $	$ 1,000,000 $ $ $ $
A	☑ UMBRELLA LIAB ☑ OCCUR EXCESS LIAB ☐ CLAIMS-MADE DED ☑ RETENTION $ 10,000	Y	Y	POLICY NUMBER	1/1/2011	Current	EACH OCCURRENCE AGGREGATE $	$ 2,000,000 $ 2,000,000 $
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y/N [N] (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N/A	Y	POLICY NUMBER	1/1/2011	Current	☑ WC STATU-TORY LIMITS ☐ OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 1,000,000 $ 1,000,000 $ 1,000,000
A	Leased/Rented/Equip. Owned Equipment Builders Risk/Installation Floater	N/A	Y	POLICY NUMBER	1/1/2011	Current	Limit; Deductible Limit; Deductible Limit; Deductible	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

Project No. _____ [Title]. Certholder (City) and _____ (Design Professional) and any other entities named in 00800 SCs are named as primary, noncontributing Additional Insureds including products and completed operations, excluding workers compensation, employers liability and professional liability. Waiver of subrogation applies as allowed by law. [The policies required above shall contain no exclusions for work expressly within the subcontractors scope of work.]

CERTIFICATE HOLDER

City of Kansas City, Missouri

_____ [Department]

_____ [Address]

Kansas City, MO _____ [Zip]

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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AUTHORIZATION TO RELEASE
A
REVENUE CLEARANCE LETTER

Revenue Division
414 East 12th Street, 2nd floor, Room 202 W
Kansas City, MO 64106 Phone (816) 513-1135 Fax (816) 513-1077 email: revenue@kcmo.org

I authorize the City of Kansas City, Missouri, Finance Department, Revenue Division, to release a Revenue Clearance Letter for:

Name of Taxpayer: _____Tax I.D.#_____
(PRINT)

Address: _____

Check this box and the City will send the Clearance Letter to you or the contractor designated.

☐ **I authorize the City to provide a copy of the Taxpayer's Revenue Clearance Letter to the following:**

NAME *(PRINT)*	**BUSINESS NAME**	**TITLE**

ADDRESS	**CITY, STATE, ZIP CODE**

PHONE NUMBER	**FAX NUMBER**	**E-MAIL ADDRESS**

☐ **I authorize the City to provide the Taxpayer's Revenue Clearance Letter to all City Departments and to publish on the City's internet/intranet website that the Taxpayer is in compliance with the tax ordinances administered by the City's Commissioner of Revenue.**

Please send my 1st Revenue Clearance Letter to: _____
(Print Name of City Department/Contact Person/E-mail/Fax Number)

This authorization shall expire one (1) year from the date of the signature.

The City, Commissioner of Revenue and the Revenue Division personnel (hereinafter "the City"), are hereby held harmless from any and all liability relating to unauthorized disclosure of confidential tax information resulting from release of information under all applicable confidentiality laws including federal, state, or local including any damages sustained by wrongful transmission of confidential tax information to any other person.

UNDER PENALTIES OF PERJURY, I DECLARE THAT I HAVE EXAMINED THIS AUTHORIZATION, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT IS TRUE, CORRECT AND COMPLETE.

I hereby certify that I am the Taxpayer named herein or that I have the authority to execute this authorization and hold harmless agreement on behalf of the Taxpayer.

NAME *(PRINT)*	**TITLE** *(IF APPLICABLE)*	
SIGNATURE	**PHONE NUMBER**	**DATE**

A FACSIMILE OF THIS DOCUMENT SHALL CONSTITUTE AN ORIGINAL

SECTION 00830

PREVAILING WAGE

1. Annual Wage Order No. 31
2. **0830.03 Division of Labor Standards Rules & Regulations** are incorporated into and made part of this Contract and are available at http://s1.sos.mo.gov/cmsimages/adrules/csr/current/8csr/8c30-3.pdf.

Missouri
Division of Labor Standards
WAGE AND HOUR SECTION

MICHAEL L. PARSON, Governor

Annual Wage Order No. 31

Section 024
CLAY COUNTY

In accordance with Section 290.262 RSMo 2000, within thirty (30) days after a certified copy of this Annual Wage Order has been filed with the Secretary of State as indicated below, any person who may be affected by this Annual Wage Order may object by filing an objection in triplicate with the Labor and Industrial Relations Commission, P.O. Box 599, Jefferson City, MO 65102-0599. Such objections must set forth in writing the specific grounds of objection. Each objection shall certify that a copy has been furnished to the Division of Labor Standards, P.O. Box 449, Jefferson City, MO 65102-0449 pursuant to 8 CSR 20-5.010(1). A certified copy of the Annual Wage Order has been filed with the Secretary of State of Missouri.

Original Signed by
Todd Smith, Director
Division of Labor Standards

Filed With Secretary of State: **March 8, 2024**

Last Date Objections May Be Filed: **April 8, 2024**

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	$70.59
Boilermaker	$35.51*
Bricklayer-Stone Mason	$62.37
Carpenter	$64.44
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	$56.58
Plasterer	
Communication Technician	$61.30
Electrician (Inside Wireman)	$68.72
Electrician Outside Lineman	$35.51*
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	$35.51*
Glazier	$58.94
Ironworker	$69.61
Laborer	$50.47
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	$56.70
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	$63.28
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	$56.98
Plumber	$78.98
Pipe Fitter	
Roofer	$59.93
Sheet Metal Worker	$75.64
Sprinkler Fitter	$71.38
Truck Driver	$56.61
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

*The Division of Labor Standards received fewer than 1,000 reportable hours for this occupational title. The public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.
**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title as defined in RSMo Section 290.210.

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Carpenter	$64.52
Millwright	
Pile Driver	
Electrician (Outside Lineman)	$35.51*
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Laborer	$51.51
General Laborer	
Skilled Laborer	
Operating Engineer	$55.82
Group I	
Group II	
Group III	
Group IV	
Truck Driver	$51.36
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

Use Heavy Construction Rates on Highway and Heavy construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(3).

Use Building Construction Rates on Building construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(2).

If a worker is performing work on a heavy construction project within an occupational title that is not listed on the Heavy Construction Rate Sheet, use the rate for that occupational title as shown on the Building Construction Rate Sheet.

*The Division of Labor Standards received fewer than 1,000 reportable hours for this occupational title. Public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.

**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title.

OVERTIME
and
HOLIDAYS

OVERTIME

For all work performed on a Sunday or a holiday, not less than twice (2x) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work.

For all overtime work performed, not less than one and one-half (1½) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work or contractual obligation. For purposes of this subdivision, **"overtime work"** shall include work that exceeds ten hours in one day and work in excess of forty hours in one calendar week; and

A thirty-minute lunch period on each calendar day shall be allowed for each worker on a public works project, provided that such time shall not be considered as time worked.

HOLIDAYS

January first;
The last Monday in May;
July fourth;
The first Monday in September;
November eleventh;
The fourth Thursday in November; and
December twenty-fifth;

If any holiday falls on a Sunday, the following Monday shall be considered a holiday.

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

ADDENDUM NUMBER ___

Project Number _____

Project Title _____

_____

[NOTE: Add Month/Date/Year for which this Addendum is officially posted by City. Be certain to remove this note before final document is printed.]

ISSUE DATE: _____

[NOTE: Addenda are used to clarify, revise, add to, or delete information in the original bidding documents or in previous addenda prior to opening of bids. Items should be organized in the same order as the original bidding documents Table of Contents. Cite the specific bidding document and the specific location within it where each change is to be made followed by the detailed change. If entire pages or documents are replaced or added as accompanying attachments, state the title of the document and the specific page number(s) removed and/or added. (e.g., Delete Section 01011 - Summary pages 1-6 and add the attached Section 01011 - Summary pages 1-10.). Be certain to remove this note before final document is printed.]

[NOTE: Add Month/Date/Year. Be certain to remove this note before final document is printed.]

Bidders are hereby notified that the Bidding and Contract Documents for the above project, for which Bids are to be received on _____, are amended as follows:

[NOTE: If the bid date is being changed add Month/Day/Year; if not, delete this sentence. Be certain to remove this note before final document is printed.]

The Bid date for this Project stated in Document 00130 - Invitation to Bid shall be changed to: 2:00 PM, on _____.

Information to Bidders The following is provided to Bidders for information only:

[NOTE: Include items under this heading such as Pre-bid meeting attendance list, soils report, etc.; items that should not be contractual, but are useful information to Bidders. Delete this heading and introduction if not applicable for this Addendum. Be certain to remove this note before final document is printed.]

1.

2.

[NOTE: Include Bidder/Proposer questions and answers to those questions. If questions are resolved by a contractual change, reference the contract section and make the appropriate change in one of the sections below. Delete this heading and table if not applicable for this Addendum. Be certain to remove this note before final document is printed.]

Q1.	
A1.	
Q2.	
A2.	
Q3.	

A3.	

[NOTE: Under the following sections, include changes to those documents under the heading with this same title found in Document 00010 - Table of Contents, (including changes to previous addenda). Format for revisions provided below. Delete sections if not applicable to this addendum. Be certain to remove this note before final document is printed.]

Bidding Requirements

1. Add the following section(s):
    a. Document, Sec. __, Subparagraph __, Page ___
    b. Document, Sec. __, Subparagraph __, Page ___

[OR]

2. Delete the following section(s):
    a. Document, Sec. __, Subparagraph __, Page ___
    b. Document, Sec. __, Subparagraph __, Page ___

[OR]

3. Delete and replace the following section(s):
    a. Delete Document, Sec. __, Subparagraph __, Page ___ and replace with the following Document, Sec. __, Subparagraph __, Page ___:
    b. Delete Document, Sec. __, Subparagraph __, Page ___ and replace with the following Document, Sec. __, Subparagraph __, Page ___:

Contracting Requirements

1.

2.

Specifications

1.

2.

Drawings:

1.

2.

NOTE: Bidders must acknowledge receipt of this Addendum by listing the number and date, where provided, on the Bid Form - Document 00410.

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

REQUEST FOR INTERPRETATION

Project Number _____

Project Title _____

Contractor _____

RFI Number _____ Date _____

From: _____

To: _____

Re: _____

Spec. Sec. Ref: Paragraph: Drawing Ref: Detail:

Signed:

Response:

❑ Attachments

Response From: To: Date Transmitted:_____ Date Rec'd:_____

Signed:_____ Signed:_____
Design Professional Owner's Representative

Distribution:
- ❑ Owner
- ❑ Contractor
- ❑ Construction Manager
- ❑ Design Professional
- ❑ Consultant _____
- ❑ Other _____

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

REQUEST FOR INTERPRETATION LOG

Project Number _____

Project Title _____

CONTRACTOR _____

OWNER _____

RFI No.	Issue Date	Brief Description of issue and response	Respond Date

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

SUPPLEMENTAL DESIGN INSTRUCTION

Project Number _____

Project Title _____

To Contractor _____

From: _____ SDI No _____ Issue Date: _____

The Work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in Contract Price or Contract Times. Proceeding with the Work in accordance with these instructions indicates your acknowledgement that there will be no change in the Contract Price or Contract Times.

Description:

❑ Attachments *(List)*

(Signature) Design Professional Date

Distribution:
- ❑ Owner
- ❑ Contractor
- ❑ Construction Manager
- ❑ Design Professional
- ❑ Consultant _____
- ❑ Other _____

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

REQUEST FOR PROPOSAL

Project Number _____

Project Title _____

To Contractor _____

From: _____ RFP No _____ Issue Date: _____

Please submit an itemized proposal for changes in the Contract Price and Contract Times for proposed modifications to the Contract Documents described herein. Submit proposal within _____ days, or notify the Owner in writing of the date on which you anticipate submitting your proposal.

This is NOT a Change Order, a Work Change Directive or a direction to proceed with the work described in the proposed modifications.

Description:

❑ Attachments

Prepared by Design Professional

Prepared by Construction Manager

REQUESTED by OWNER'S Representative

Distribution:
- ❑ Owner
- ❑ Contractor
- ❑ Construction Manager
- ❑ Design Professional
- ❑ Consultant _____
- ❑ Other _____

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

CHANGE ORDER

Project Number _____

Project Title _____

Change Order No: _____ Date of Issuance: _____

Ordinance No: _____ Ordinance Effective Date: _____

Contract Notice To Proceed Date: _____

To CONTRACTOR:

The Contract is changed as follows: _____

This Change Order constitutes compensation in full on behalf of the Contractor and its subcontractors and suppliers for all costs, including impact costs and extended general conditions, and markups directly and indirectly attributable to the Work changes ordered herein, for all delays related thereto and for performance of the changes within the time stated. Contractor hereby releases all claims for delay, interruption, extended general conditions, impact and cumulative impact claims for this Work.

[**Note**: Identify the specific attachments; example:"Attachment A, Additional Scope of Services." Delete **all** notes before printing final]

□ See Attached Document(s).

[**Note:** If the CO does not change the Contract Price, use "Director" instead of "Director of Finance"]

Not valid until signed by the Director of Finance.

The original Contract Price was	$0.00
Net change by previously authorized Change Orders	$0.00
The Contract Price prior to this Change Order was	$0.00
The Contract Price will be (□ increased by) (□ decreased by) (□ unchanged)	$0.00
The new Contract Price including this Change Order will be	$0.00
[Note: If revised, establish and enter new dates. If unchanged, enter current contract dates.	
If you are only changing the Final Completion date, add the following reference:	
"The Contract Time for Final Completion will be . . ."]	
The Contract Time will be (□ increased by) (□ decreased by) (□ unchanged)	( ) calendar days
The date of Substantial Completion as of the date of this Change Order therefore is	Enter Date
The date of Final Completion as of the date of this Change Order therefore is	Enter Date

Project No. & Title
Change Order No.
[**Note:** Include any required additional signatures.]

DESIGN PROFESSIONAL:	**By:** **Title:**	**Date:**
CONTRACTOR:	**By:** **Title:**	**Date:**
CITY:	**By** **Title:**	**Date:**

Approved as to form: _____
Assistant City Attorney

[**Note**: If this CO does not change the Contract Price, delete the cert. of funds by Finance Director but send signed copy to Finance.]

I certify there is a balance otherwise unencumbered to the credit of the appropriation to which the above amount is chargeable, and a cash balance otherwise unencumbered in the treasury to the credit of the fund from which payment is to be made, each sufficient to meet the above obligation.

By: _____
Director of Finance Date

Distribution:
- ❑ CITY
- ❑ CONTRACTOR
- ❑ DESIGN PROFESSIONAL

REMINDER: CONTRACTOR is responsible for considering the effect this Change Order may have on its ability to meet or exceed the D/M/WBE participation amounts in its Contractor Utilization Plan (CUP) as amended by any previously approved Request for Modification/Substitution. If CONTRACTOR will not be able to achieve the approved participation amounts in performing the work included within this Change Order, or if CONTRACTOR needs to retain the services of additional D/M/WBEs not previously listed in its CUP, CONTRACTOR is advised to submit a Request for Modification/Substitution.

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

WORK CHANGE DIRECTIVE

Project Number _____

Project Title _____

No.: _____ Date of Issuance: _____

TO:
(CONTRACTOR)

You are directed to proceed promptly with the following work:

Description:

Purpose of Work Change Directive:

Attachments: *(List documents supporting change)*

If the above work results on a change in the Contract Price or Contract Times, any request for a Change Order based thereon will involve one or more of the following methods of determining the effect of the change(s).

Method of determining change in Contract Price:	Method of determining change in Contract Times:
❑ Unit Prices	❑ CONTRACTOR's Records
❑ Lump Sum	❑ DESIGN PROFESSIONAL's Records
❑ As Stipulated in General Conditions	❑ City's Records
❑ Other _____	❑ Other _____
Estimated increase (decrease) in Contract Price:	Estimated increase (decrease) in Contract Times:
$ _____	Substantial Completion: _____ days;
If the change involves an increase, the estimated Amount is not to be exceeded without further authorization.	Final Completion: _____ days. If the change involves an increase, the estimated times are not to be exceeded without further authorization.

Recommended:	Recommended:	Recommended:
DESIGN PROFESSIONAL	Construction Manager	City
By (Authorized Signature)	By (Authorized Signature)	By (Authorized Signature)

Distribution:
❑ City
❑ Contractor
❑ Construction Manager
❑ Design Professional
❑ Consultant
❑ Other

WORK CHANGE DIRECTIVE ("WCD") INSTRUCTIONS

[Note: Do not attach these instructions to the WCD Form]

A. GENERAL INFORMATION

This document was developed for use in situations involving changes in the Work which, if not processed expeditiously, might delay the Project. These changes are often initiated in the field and may affect the Contract Price or the Contract Times. This is not a Change Order, but only a directive to proceed with Work that may be included in a subsequent Change Order. If the WCD may result in an increase in the Contract Price, a contract impact cost analysis must be performed prior to issuing the WCD. Availability of funds and authorization to expend funds must be part of the analysis.

For supplemental instructions and minor changes not involving a possible change in the Contract Price or the Contract Times a Supplemental Design Instruction may be used.

B. COMPLETING THE WORK CHANGE DIRECTIVE FORM

Based on conversations between Design Professional, City's Representative and CONTRACTOR, Design Professional must complete the following:

DESCRIPTION: shall include a summary of the Work included in the WCD. Additional information may be attached to the WCD to further define the scope.

PURPOSE OF WORK CHANGE DIRECTIVE: will identify clearly if the Work included in the WCD is an addition, deletion, revision, or some combination.

ATTACHMENTS: shall identify all attachments included in and made a part of the WCD. Be certain that attachments are clearly labeled.

METHOD OF DETERMINING CHANGE, IF ANY, IN CONTRACT PRICE: Mark the method to be used in determining the final cost of Work involved and the estimated net effect on the Contract Price. If the change involves an increase in the Contract Price and the estimated amount is approached before the additional or changed Work is completed, another WCD must be issued to change the estimated price. Do not leave blank spaces or write "To be determined" (or "TBD"). An estimated dollar figure must be assigned to the Work. If the WCD is not likely to change the Contract Price, the space for estimated increase (decrease) should be marked "No Change in Price".

METHOD OF DETERMINING CHANGE, IF ANY, IN CONTRACT TIMES: Mark the method to be used in determining the change in Contract Times and the estimated increase or decrease in Contract Times. If the change involves an increase in the Contract Times and the estimated times are approached before the additional or changed Work is completed, another WCD must be issued to change the times or CONTRACTOR may stop the changed Work when the estimated times are reached. Do not leave blank spaces or write "To be determined" (or "TBD"). If the WCD is not likely to change the Contract Times, the space for estimated increase (decrease) should be marked "No Change in Times".

Once Design Professional has completed and signed the form, all copies should be sent to CITY for authorization because Design Professional does not have authority to authorize changes in Price or Times. Once authorized by CITY, a copy must be sent by Design Professional to CONTRACTOR. Price and Times may only be changed by Change Order signed by CITY, Design Professional, and CONTRACTOR. If the value of the work included in the WCD exceeds the contingency or budget available for the contract, staff must obtain written approval from the Director or his or her designee before the WCD is issued. A Director or his or her designee may not approve a WCD that will exceed City Council authorization. If the work included in the WCD is needed as a result of an emergency, staff may proceed with the issuance of the WCD without

prior written approval even if the value of the work added is expected to exceed the contract contingency balance.

Once the Work covered by this directive is completed or final cost and times are determined. CONTRACTOR must submit proper documentation for inclusion in a Change Order.

IF THIS IS A DIRECTIVE TO PROCEED WITH A CHANGE THAT MAY AFFECT THE CONTRACT PRICE OR THE CONTRACT TIMES A CHANGE ORDER, IF ANY, MUST BE PROCESSED PROMPTLY.

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

DESIGN-BUILD GENERAL CONDITIONS

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ARTICLE 1 DEFINITIONS AND TERMINOLOGY

1.01 Defined Terms

A. Wherever used in these General Conditions or in the other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

1. ***Addenda*** - Written or graphic instruments issued prior to the opening of Bids that clarify, correct or change the Bidding Requirements or the Contract Documents.

2. ***Agreement*** - The written Contract between CITY and DESIGN-BUILDER governing the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.

3. ***Application for Payment*** - The form accepted by CITY's Representative which is to be used by DESIGN-BUILDER in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. ***Asbestos*** - Any material that contains more than one percent (1%) Asbestos and is friable or is releasing Asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. ***Bid*** - consists of (1) the Technical Approach Submittal of the DESIGN-BUILDER providing information on the design and construction Work to be undertaken by DESIGN-BUILDER for the Project and (2) the Price Submittal setting forth the firm, fixed price for which the DESIGN-BUILDER agrees to perform all of the Work required by the Contract Documents.

6. ***Bidder*** - One who submits a Bid directly to CITY, as distinct from a sub-bidder who submits a bid to a Bidder. If the CITY executes the Bid Form/Contract submitted by Bidder, the term “Bidder” shall mean DESIGN-BUILDER in both the Bidding Documents and Contract Documents unless the context clearly indicates otherwise.

7. ***Bidding Documents*** - The advertisement or Invitation to Bid, Instructions to Bidders, the Bid Form/Contract, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

8. ***Bidding Requirements*** - The advertisement or invitation to bid, Instructions to Bidders, Bid security, and the Bid Form/Contract with any supplements.

9. ***Bonds*** - Payment Bond and Performance and Maintenance Bond and other instruments of security.

10. ***Calendar Day*** - Any day shown on the calendar, including Saturdays, Sundays, and holidays.

11. ***Change Order*** - A written document issued by CITY that authorizes an addition, deletion or revision in the Work, or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Contract.

12. ***CITY/OWNER*** - Kansas City, Missouri, a constitutionally chartered municipal corporation, with which DESIGN-BUILDER has entered into the

Contract and for whom the Work is to be provided**.**

13. CITY's Project Design and Construction Criteria - are set forth in the Project Information portion of the Bidding Documents, and are those criteria developed by or for CITY to describe CITY's program requirements and objectives for the Project, including use, space, price, time, site, and expandability requirements, as well as submittal requirements and other requirements governing DESIGN-BUILDER's performance of the Work. CITY's Project Design and Construction Criteria may include, without limitation, survey information; interior space requirements; material quality standards; schematic layouts and conceptual design criteria; cost or budget estimates; design and construction schedules; site development requirements; provisions for utilities, storm water retention and disposal, and parking requirements; standards, codes, and design manuals required to be employed; aesthetic considerations; conceptual documents; design criteria and performance-based criteria and requirements; and other Project-specific technical materials and requirements.

14. ***CITY's Representative*** - Person or agency designated to act for the Director as provided in these Contract Documents.

15. Construction Documents - means the complete and detailed drawings and specifications prepared or furnished by the DOR that provide the detailed requirements for construction of the Project, including, without limitation, defining the quantities and qualities of, and the relationships among, all of the materials and equipment needed to construct and deliver to CITY a finished and functional Project that conforms to CITY's Project Design and Construction Criteria.

16. ***Consultant*** - a person, firm, or corporation having a contract with CITY to furnish services as an independent professional associate or consultant (including, without limitation, as a construction manager, construction advisor, or program manager) with respect to the Project and who is identified as such in the Supplementary Conditions. The term "Consultant" also includes such person's firms, or corporation's agents, officers, directors, or employees.

17. Contract - The entire and integrated written agreement between CITY and DESIGN-BUILDER concerning the Work that incorporates all Contract Documents. The Bid Form/Contract submitted by Bidder is the Contract between CITY and DESIGN-BUILDER upon execution by CITY. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral*.*

18. ***Contract Documents*** - The Contract Documents establish the rights and obligations of the parties and include the Contract, Addenda (which pertain to the Contract Documents), DESIGN-BUILDER's Bid Form/Contract (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Intent to Contract), the HRD Construction Project Instructions, the DESIGN-BUILDER's Utilization Plan/Request for Waiver, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Project Manual and the certification page(s) of the CITY and Consultant(s), together with approved project baseline schedule and amendments thereto and all Written Amendments, Change Orders, Work Change Directives, and CITY's written interpretations and

clarifications issued on or after the Effective Date of the Contract, and approved Shop Drawings. Reports and drawings of subsurface and physical conditions are not Contract Documents. Only printed or hard copies of the items listed in this Paragraph are Contract Documents. Files in electronic media format of text, data, graphics, and the like that may be furnished by CITY to DESIGN-BUILDER are not Contract Documents, except project schedules submitted by DESIGN-BUILDER and approved by CITY.

16. Contract Price - The money payable by CITY to DESIGN-BUILDER for completion of the Work in accordance with the Contract Documents as stated in the Agreement.

20. Contract Times - the number of calendar days or the date(s) stated in the Contract Documents for DESIGN-BUILDER to achieve certain Milestones, to achieve Substantial Completion of the Work, or portions of the Work, and to complete the entire Work such that DESIGN-BUILDER is entitled to receive final payment.

21. *Day* – Shall constitute a Calendar Day.

22. DESIGN-BUILDER - is the single entity or combination of persons and/or entities having the licensure, qualifications, and capability to perform as both a Designer of Record and a General Contractor on the Project, authorized by law to do business in Missouri and to perform or furnish professional design services and construction services for the Project, with whom CITY has entered into the Contract.

23. Designer of Record or DOR - is the qualified design professional member of DESIGN-BUILDER, holding a currently valid license or certificate of authority issued by the State of Missouri pursuant to Chapter 327, Revised Statutes of Missouri, who is to perform, provide for the performance of, oversee, and coordinate all of the professional design services for the Project, either directly, through employees or associates, or through agreements with Design Subconsultants; who shall review and approve all shop drawings issued on the Project; who shall coordinate the services of all design professionals and trade disciplines on the Project; who shall confirm the compliance of the Project as designed and constructed with the design intent of CITY's Project Design and Construction Criteria; and who shall bear ultimate responsibility for the accuracy, completeness, quality, and propriety of all professional design services performed on the Project.

24. Design Subconsultant means those qualified design professionals other than the DOR holding currently valid licenses or certificates of authority issued by the State of Missouri pursuant to Chapter 327, Revised Statutes of Missouri, who are retained by the DESIGN-BUILDER, the DOR, or the GC to perform or furnish professional design services for the Project.

25. *Director* - The term Director shall mean the duly appointed executive officer of a department of CITY who is empowered by the City Charter or by the City Council to enter into a contract on behalf of CITY, or to grant a permit for improvements to land owned by CITY. A Director is authorized to delegate this authority to a CITY employee so designated in writing.

26. *Drawings* - The drawings which graphically show the scope, extent and

character of the Work to be furnished and performed by DESIGN-BUILDER and which have been prepared by DESIGN PROFESSIONAL and are included in the Contract Documents. Shop Drawings are not Drawings as so defined.

27. ***Effective Date of the Contract*** - The date indicated in the Contract on which it becomes effective, but if no such date is indicated it means the date on which the Contract is fully executed by CITY.

28. **General Contractor or GC** - means that member of DESIGN-BUILDER, qualified to perform construction services for the Project in the City of Kansas City, Missouri, who is to perform or oversee the performance of the construction services for the Project, either directly or through agreements with Subcontractors; who shall oversee and coordinate the services of all trade disciplines on the Project; who shall ensure the compliance of the Project, as constructed, with the Project design documents; and who shall bear responsibility for the accuracy, completeness quality, and propriety of all construction services performed on the Project.

29. ***General Requirements*** - Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

30. ***Hazardous Environmental Condition*** - The presence at the Site of Asbestos, Lead-Based Paint, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

31. ***Hazardous Waste*** - The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

32. ***Laws or Regulations*** - Any and all applicable laws, rules, regulations, ordinances, codes and orders of any and all governmental bodies, agencies, authorities and courts having jurisdiction.

33. **Lead Architect** - refers to that natural person, identified by DESIGN-BUILDER as such in the Key Personnel portion of the Technical Approach Submittal of DESIGN-BUILDER's Bid, who is undertaking primary responsibility for the performance and furnishing of all professional design services for the Project and for the other obligations of the DOR under the Contract Documents.

34. ***Lead-Based Paint*** - Any paint, varnish, stain, or other applied coating that has one (1) mg or more of lead per square centimeter. The terms "leaded paint" and "lead-containing paint" are synonymous with Lead-Based Paint.

35. ***Liens*** - Liens, charges, security interests or encumbrances upon real property or personal property.

36. ***Milestone*** - A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

37. ***Notice of Intent to Contract*** - The written notice by CITY to the apparent successful Bidder stating that upon compliance by that apparent successful Bidder with the conditions in the Bid Documents enumerated, within the time specified, and upon enactment of an appropriate ordinance or resolution, CITY

will sign and deliver the Contract.

38. ***Notice to Proceed*** - The written notice given by CITY to DESIGN-BUILDER, establishing the date on which the Contract Time(s) will commence to run and on which date DESIGN-BUILDER shall begin to perform its obligations under the Contract Documents. The term includes, without limitation, the Contract Notice to Proceed, the Design Notice to Proceed, and/or the Construction Notice to Proceed, as defined in the Contract for DESIGN-BUILDER Services... DESIGN-BUILDER shall perform no Work or services prior to the date on which the Contract Time(s) commence to run.

39. ***Partial Utilization*** - Use by CITY of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.

40. ***PCBs*** - Polychlorinated biphenyls.

41. ***Petroleum*** - Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Wastes and crude oils.

42. ***Project*** - The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

43. ***Project Manual*** - The documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual may be issued in one or more volumes and is contained in the table(s) of contents.

44. **Request for Qualifications or RFQ** - is the written solicitation issued by CITY for the Project, requesting preparation and submission of Statements of Qualifications by interested Applicants.

45. ***Radioactive Material*** - Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

46. ***Samples*** - Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

47. ***Shop Drawings*** - All drawings, diagrams, illustrations, schedules and other data or information which are specifically prepared or assembled by or for DESIGN-BUILDER and submitted by DESIGN-BUILDER to illustrate some portion of the Work.

48. ***Site*** - Lands or areas indicated in the Contract Documents as being furnished by CITY upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by CITY which are designated for the use of DESIGN-BUILDER.

49. ***Specifications*** - Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative

details applicable thereto.

50. Statement of Qualifications or *SOQ* - Written and/or graphic description of the credentials, qualifications, experience, and other information about an Applicant that is responsive to the evaluation criteria set forth in the RFQ.

51. *Subcontractor* - Any individual, firm, partnership, company, corporation or association licensed or otherwise authorized by law to do business in Missouri, to whom DESIGN-BUILDER, with written notification to CITY, has entered into an agreement to perform a part of the Work.

52. *Substantial Completion* - When Work (or a specified part thereof) has progressed to the point where, in the opinion of CITY as evidenced by CITY's definitive certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

53. *Supplementary Conditions* - The part of the Contract Documents which amends and/or supplements these General Conditions.

54. *Supplier*- A manufacturer, fabricator, supplier, distributor, material man or vendor having a direct contract with DESIGN-BUILDER or with any Subcontractor to furnish materials or equipment to be incorporated into the Work by DESIGN-BUILDER or any Subcontractor.

55. *Underground Facilities* - All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

56. *Unit Price Work* - Work to be paid for on the basis of unit prices.

57. *Work* - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work includes and is the result of performing or furnishing labor, and furnishing and incorporating material and equipment into the construction, and furnishing documents, all as required by the Contract Documents.

58. *Work Change Directive* - A written directive to DESIGN-BUILDER, issued on or after the Effective Date of the Contract, signed by CITY and recommended by CITY, ordering an addition, deletion or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed, or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times, but is evidence that the parties expect that the change directed or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

59. *Written Amendment*- A written statement modifying the Contract

Documents, signed by CITY and DESIGN-BUILDER on or after the Effective Date of the Contract and normally dealing with the non-engineering or non-technical rather than strictly construction-related aspects of the Contract Documents.

1.02 Terminology

A. Intent of Certain Terms or Adjectives

1. Whenever in the Contract Documents the terms "as ordered," "as directed," "as required," "as allowed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper" or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review or judgment of CITY as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to CITY any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.08 or any other provision of the Contract Documents.

B. Defective

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty or deficient, in that it does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to CITY's Representative's recommendation of final payment (unless responsibility for the protection thereof has been assumed by CITY at Substantial Completion in accordance with Paragraph 13.5).

C. Furnish, Install, Perform, Provide

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of DESIGN-BUILDER, "provide" is implied.

D. Unless stated otherwise in the Contract Documents, words and phrases which have a well-known technical or construction industry or trade meanings are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 PRELIMINARY MATTERS

2.01 Delivery of Bonds

A. DESIGN-BUILDER shall deliver to CITY such Bonds as DESIGN-BUILDER may be required to furnish.

2.02 Evidence of Insurance

A. DESIGN-BUILDER shall deliver to CITY certificates of insurance or other evidence of insurance that CITY may request, which DESIGN-BUILDER is required to purchase and maintain in accordance with Article 5 or any other applicable provision in the Contract Documents.

2.03 Copies of Documents

A. CITY shall furnish to DESIGN-BUILDER one (1) copy of the Drawings and Specifications, including addenda.

2.04 Commencement of Contract Times; Notice to Proceed

A. The Contract Times will commence to run on the date indicated in the Notice to Proceed.

2.05 Starting the Work

A. DESIGN-BUILDER shall start to perform the Work on the date when the Contract Times commence to run, but no Work shall be done at the Site prior to the date on which the Contract Times commence to run, unless otherwise indicated in the Notice to Proceed.

2.06 Before Starting Construction

A. Preliminary Schedules: Within ten (10) days after the Effective Date of the Contract or on such later date as CITY's Representative shall provide in writing, DESIGN-BUILDER shall submit to CITY's Representative for review:

1. Preliminary Progress Schedule: DESIGN-BUILDER shall submit a proposed project schedule for CITY’s acceptance. The proposed project schedule shall include a detailed and comprehensive design and construction schedule utilizing a critical path method diagram network that (a) shows all major procurement and construction elements and phases of the Project; (b) breaks down each element or phase by trade; (c) shows early and late starts so that all float time will be accurately identified; (d) all other activities necessary for the timely completion of the Project in accordance with the scheduled dates for Substantial and Final Completion; and (e) highlights the project’s critical path. CITY’s acceptance is expressly limited to CITY’s acknowledgement that, based upon CITY’s limited review, the dates of Substantial Completion and Milestone dates are acceptable. After final acceptance of the preliminary progress schedule by the CITY, it shall be considered the project baseline schedule pursuant to Paragraph 2.07(B).

2. Preliminary schedule of Shop Drawings and Sample submittals which will list each required submittal and the times for submitting, reviewing and processing such submittal; and

3. Preliminary 01290.02 Schedule of Values for all of the Work which will include quantities and prices of items which when added together equals the Contract Price and will subdivide the Work into component parts in sufficient detail to

serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.07 Initially Acceptable Schedules

A. Thirty day interim schedule: The DESIGN-BUILDER shall prepare and submit to the CITY a 30-day interim schedule within seven (7) Calendar Days after the Notice to Proceed. This schedule shall contain the sequence and dates of major work for the entire duration of the Work, including the following activities.

1. The construction activities to be accomplished or commenced during the first thirty (30) Calendar Days following the Notice to Proceed;

2. Procurement and submittal approvals, fabrication and delivery of all long lead time procurement activities;

3. Activities or Milestones that may be affected by the actions of the CITY or third parties.

The DESIGN-BUILDER shall incorporate the CITY's comments and resubmit the 30-day interim schedule within seven (7) Calendar Days from receipt of the CITY's comments.

B. Project Baseline Schedule: The DESIGN-BUILDER's 30-day interim schedule, as revised by the CITY pursuant to Paragraph 2.07A, shall be considered the baseline schedule and shall be used by the DESIGN-BUILDER for planning, scheduling, managing, and executing the Work. The baseline schedule shall not be changed without the written consent of CITY.

C. DESIGN-BUILDER's schedule of values will be acceptable to CITY's Representative as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 Intent

A. The Contract Documents comprise the entire Contract between CITY and DESIGN-BUILDER concerning the Work.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be furnished and performed whether or not specifically called for at no additional cost to CITY. Clarifications and interpretations of the Contract Documents shall be issued by CITY.

C. Correlation and intent of documents: The Drawings and Specifications are intended to supplement each other. Any Work shown on the Drawings and not mentioned in the Specifications (or vice versa) shall be as binding and shall be completed the same as if mentioned or shown on both. In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities:

1. .The Contract, including all Change Orders and Written Amendments

2. Approved Shop Drawings

3. Addenda, with those of later date having precedence over those of earlier date

4. Project Baseline Schedule Requirements

5. The Supplementary Conditions

6. The General Conditions

7. Drawings and Specifications

D. In the case of an inconsistency between Drawings and Specifications, the requirements of the Specifications shall govern. If Drawings are in conflict, larger scale details shall govern over smaller or no-scale Drawings. If Specification sections are in conflict with each other, the conflict shall be resolved by CITY in accordance with reasonable interpretation of such documents.

E. The general character of the detailed Work is shown on the Drawings, but minor modifications may be made in the full size or scale details. Where the word "similar" occurs on the Drawings, it shall be used in its general sense and not as meaning identical, and all details shall be worked out in relation to their location and their connection to the other parts of the Work. Where on any Drawings a portion of the Work is drawn out and the remainder is indicated in outline, the parts drawn out shall apply also to all other like portions of the Work. Where ornaments or other details are indicated by starting only, such details shall be continued throughout the courses or parts in which they occur and shall also apply to all other similar parts in the Work, unless otherwise indicated.

3.02 Reference to Standards and Specifications of Technical Societies

A. Reference to standards, specifications, manuals or codes of any technical society, organization or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code or Laws or Regulations in effect at the time of opening of Bids (or on the date of DESIGN-BUILDER's proposal if there are no Bids), except as may be otherwise specifically stated in the Contract Documents.

1. No provision of any such standard, specification, manual, code or instruction of Supplier shall be effective to change the duties or responsibilities of CITY, or DESIGN-BUILDER, or any of their Subcontractors, Consultants, agents, or employees from those set forth in the Contract Documents, nor shall it be effective to assign to CITY or any of CITY’s Consultants, agents or employees any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 Reporting and Resolving Discrepancies

A. Reporting Discrepancies: If, during the performance of the Work, DESIGN-BUILDER discovers any conflict, error, ambiguity or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Laws or Regulations applicable to the performance of the Work or of any standard, specification, manual, code or any instruction of any Supplier referred to in Paragraph 6.07, DESIGN-BUILDER shall report it immediately to CITY in writing. DESIGN-BUILDER shall not

proceed with the Work affected thereby (except in an emergency as authorized by Paragraph 6.17) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04; provided, however, that DESIGN-BUILDER shall not be liable to CITY or CITY's Consultants for failure to report any such conflict, error, ambiguity or discrepancy unless DESIGN-BUILDER knew or reasonably should have known thereof.

B. Resolving Discrepancies. The provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity or discrepancy between the provisions of the Contract Documents and:

1. the provisions of any standard, specification, manual, code or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

2. the provisions of any Laws or Regulations applicable to the performance of the Work.

3.04 Amending and Supplementing Contract Documents

A. The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:

1. a Written Amendment or

2. a Change Order (pursuant to Article 10), whether pursuant to a Work Change Directive or otherwise.

B. The requirements of the Contract Documents may be supplemented and minor variations and deviations in the Work may be authorized, in one or more of the following ways:

1. CITY's approval of a Shop Drawing or Sample, or

2. CTY's written interpretation or clarification.

ARTICLE 4 AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS

4.01 Availability of Lands

A. CITY shall furnish the Site. CITY shall identify any encumbrances or restrictions not of general application but specifically related to use of lands so furnished with which DESIGN-BUILDER will have to comply in performing the Work. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by CITY, unless otherwise provided in the Contract Documents. If DESIGN-BUILDER and CITY are unable to agree on entitlement to or the amount or extent of any adjustments in the Contract Price or the Contract Times or both as a result of any delay in CITY's furnishing these lands, rights-of-way or easements, DESIGN-BUILDER may make a Claim as provided in Article 15. DESIGN-BUILDER shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 Subsurface and Physical Conditions

A. Reports and Drawings: Reference is made to the Supplementary Conditions for identification of:

1. Subsurface Conditions: Those reports of explorations and tests of subsurface conditions at or contiguous to the Site that have been utilized by CITY in preparing the Contract Documents; and

2. Physical Conditions: Those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that have been utilized by CITY in preparing the Contract Documents.

B. Limited Reliance by DESIGN-BUILDER on Technical Data Authorized: DESIGN-BUILDER may rely upon the general accuracy of the technical data contained in reports and drawings of subsurface or physical conditions, but such reports and drawings are not Contract Documents. The technical data is identified in the Supplementary Conditions. Except for reliance on such technical data, DESIGN-BUILDER may not rely upon or make any Claim against CITY, or CITY's Consultants with respect to:

1. the completeness of such reports and drawings for DESIGN-BUILDER's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by DESIGN-BUILDER and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings, or

3. any DESIGN-BUILDER interpretation of or conclusion drawn from any technical data or any such other data, interpretations, opinions or information.

4.03 Differing Subsurface or Physical Conditions

A. Notice of Differing Subsurface or Physical Conditions. If DESIGN-BUILDER believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any technical data on which DESIGN-BUILDER is entitled to rely as provided in Paragraphs 4.02 A and 4.02 B is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then DESIGN-BUILDER shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.17), notify CITY in writing about such condition(s). DESIGN-BUILDER shall not further disturb such conditions or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. CITY's Review: After receipt of notice as required by Paragraph 4.03 A, CITY will promptly review the pertinent conditions, determine the necessity for CITY to obtain additional exploration or tests with respect thereto and notify DESIGN-BUILDER in writing of CITY's findings and conclusions.

C. Possible Contract Documents Change: If CITY concludes that a change in the

Contract Documents is required as a result of a condition that meets one or more of the categories in Paragraph 4.03 A, a Work Change Directive or a Change Order will be issued as provided in Article 10 to reflect and document the consequences of such change.

D. Possible Price or Times Adjustments: An equitable adjustment in the Contract Price or in the Contract Times, or both, will be allowed to the extent that the existence of a subsurface or physical condition causes an increase or decrease in DESIGN-BUILDER's cost of, or time required for, performance of the Work; subject, however, to the following:

1. the condition must meet any one or more of the categories described in Paragraphs 4.03 A.1 through 4.03 A.4, inclusive;

2. a change in the Contract Documents pursuant to Paragraph 4.03 C will not be an automatic authorization of, nor a condition precedent to, entitlement to any such adjustments;

3. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.06 and 10.04; and

4. DESIGN-BUILDER shall not be entitled to any adjustment in the Contract Price or Contract Times if;

a. DESIGN-BUILDER knew, or by the exercise of ordinary care could have known, of such conditions at the time DESIGN-BUILDER made a final commitment to CITY with respect to Contract Price and Contract Times by the submission of a Bid; or

b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for DESIGN-BUILDER prior to DESIGN-BUILDER's making such final commitment; or

c. DESIGN-BUILDER failed to give the written notice as required by Paragraph 4.03 A.

E. If CITY and DESIGN-BUILDER are unable to agree on entitlement to, or magnitude of, an equitable adjustment in the Contract Price pursuant to Article 10 and/or Contract Times pursuant to Article 11, a Claim may be made therefore as provided in Article 15. However, CITY, CITY's Consultants shall not be liable to DESIGN-BUILDER for any costs, losses or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all other dispute resolution costs) sustained by DESIGN-BUILDER on or in connection with any other project or anticipated project.

4.04. Physical Conditions - Underground Facilities

A. Shown or Indicated: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to CITY by the owners of such Underground Facilities or by others.

1. CITY shall not be responsible for the accuracy or completeness of any such

information or data; and

2. The cost of all of the following will be included in the Contract Price and DESIGN-BUILDER shall have full responsibility for:

a. reviewing and checking all such information and data,

b. locating all Underground Facilities shown or indicated in the Contract Documents,

c. coordination of the Work with the owners of such Underground Facilities during construction, and

d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. Not Shown or Indicated: If an Underground Facility is uncovered or revealed at or contiguous to the Site, and was not shown or indicated in the Contract Documents, or was shown or indicated incorrectly in the Contract Documents, DESIGN-BUILDER shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.17), identify the owner of such Underground Facility and give written notice to that owner and to CITY.

C. CITY's Review: After receipt of notice as required by Paragraph 4.04 B, CITY will promptly review the consequences of the existence of the Underground Facility and notify DESIGN-BUILDER in writing CITY's findings and conclusions.

D. Possible Contract Documents Change: If CITY concludes that a change in the Contract Documents is required as a result of the existence of an Underground Facility that either was not shown, or was shown incorrectly, in the Contract Documents, a Work Change Directive or Change Order will be issued as provided in Article 10 to reflect and document the consequences of such change.

E. Possible Price or Times Adjustments: An equitable adjustment in the Contract Price or in the Contract Times, or both, will be allowed to the extent that the existence of the Underground Facility causes an increase or decrease in DESIGN-BUILDER's cost of, or time required for, performance of the Work; subject, however, to the following:

1. a change in the Contract documents pursuant to Paragraph 4.04 D will not be an automatic authorization of, nor a condition precedent to, entitlement to any such adjustments;

2. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.06 and 10.04; and

3. DESIGN-BUILDER shall not be entitled to any adjustment in the Contract Price or Contract Times if;

a. DESIGN-BUILDER knew, or by the exercise of ordinary care could have known, of the existence of the Underground Facility at the time DESIGN-BUILDER made a final commitment to CITY with respect to Contract Price and Contract Times by the submission of a Bid; or

b. the existence of the Underground Facility could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test or study of the Site and contiguous areas required by the

Bidding Requirements or Contract Documents to be conducted by or for DESIGN-BUILDER prior to DESIGN-BUILDER's making such final commitment; or

c. DESIGN-BUILDER failed to give the written notice as required by Paragraph 4.04 B.

F. If CITY and DESIGN-BUILDER are unable to agree on entitlement to, or magnitude of, an equitable adjustment in the Contract Price pursuant to Article 10 and/or Contract Times pursuant Article 11, a Claim may be made therefore as provided in Article 15. However, CITY and CITY's Consultants shall not be liable to DESIGN-BUILDER for any costs, losses or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all other dispute resolution costs) sustained by DESIGN-BUILDER on or in connection with any other project or anticipated project.

4.05 Reference Points

A. CITY shall provide engineering surveys to establish reference points for construction that in CITY's judgment are necessary to enable DESIGN-BUILDER to proceed with the Work. DESIGN-BUILDER shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of CITY. DESIGN-BUILDER shall report to CITY whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 Asbestos, Lead-Based Paint, PCBs, Petroleum, Hazardous Waste or Radioactive Material

A. Reports and Drawings: Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the CITY in the preparation of the Contract Documents.

B. Limited Reliance by DESIGN-BUILDER on Technical Data Authorized: DESIGN-BUILDER may rely upon the general accuracy of the technical data contained in reports and drawings relating to a Hazardous Environmental Condition at the Site, but such reports and drawings are not Contract Documents. Such technical data is identified in the Supplementary Conditions. Except for such reliance on such technical data, DESIGN-BUILDER may not rely upon or make any Claim against CITY, or CITY's Consultants with respect to:

1. the completeness of such reports and drawings for DESIGN-BUILDER's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by DESIGN-BUILDER and safety precautions and programs incident thereto; or

2**.** other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any DESIGN-BUILDER interpretation of or conclusion drawn from any technical data or any such other data, interpretations, opinions or information.

C. DESIGN-BUILDER shall not be responsible for any Hazardous Environmental

Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. DESIGN-BUILDER shall be responsible for all Hazardous Environmental Conditions created with any materials brought to the Site by DESIGN-BUILDER, Subcontractors, Suppliers, or anyone else for whom DESIGN-BUILDER is responsible. DESIGN-BUILDER shall not be entitled to an extension of the Contract Times or an increase in the Contract Price if DESIGN-BUILDER, Subcontractor, Supplier or anyone for whom DESIGN-BUILDER is responsible created any Hazardous Environmental Condition at the Site or in connection with the Work.

D. If DESIGN-BUILDER encounters a Hazardous Environmental Condition at the Site or if DESIGN-BUILDER or anyone for whom DESIGN-BUILDER is responsible creates a Hazardous Environmental Condition at the Site, DESIGN-BUILDER shall immediately:

1. secure or otherwise isolate such condition;

2. stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6. 15); and

3. notify CITY (and promptly thereafter confirm such notice in writing). CITY shall promptly determine the necessity for CITY to retain a qualified expert to evaluate such condition or take corrective action, if any.

E. DESIGN-BUILDER shall neither resume Work nor be required to resume Work in connection with such condition or in any affected area until after CITY has obtained any required permits related thereto and delivered to DESIGN-BUILDER written notice:

1. specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or

2. specifying any special conditions under which such Work may be resumed safely. If CITY and DESIGN-BUILDER cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price pursuant to Article 10and/or Contract Times to pursuant to Article 11 as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by DESIGN-BUILDER, a Claim may be made therefore as provided in Article 15.

F. If after receipt of written notice as required in Paragraph 4.06 E, DESIGN-BUILDER does not agree to resume Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under special conditions specified in the notice, then CITY may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If CITY and DESIGN-BUILDER cannot agree as to entitlement to or magnitude of an equitable adjustment in Contract Price pursuant to Article 10and/or Contract Times pursuant to Article 11 as a result of deleting such portion of the Work, then a Claim may be made therefore as provided in Article 15. CITY may have such deleted portion of the Work performed by CITY's own forces or others in accordance with Article 7.

G. The provisions of Paragraphs 4.02, 4.03, and 4.04 are not intended to apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

H. All materials used, whether new or salvaged, shall be asbestos-free materials. DESIGN-BUILDER shall immediately call to the attention of the CITY's Representative any specified material or product which the DESIGN-BUILDER knows or suspects to

contain asbestos, whether new or salvaged.

ARTICLE 5 BONDS AND INSURANCE

5.01 Performance, Payment and Other Bonds

A. DESIGN-BUILDER shall furnish Performance and Maintenance and Payment Bonds, each in an amount at least equal to the Contract Price, as set out in the Contract Documents, as security for the faithful performance and payment of all DESIGN-BUILDER's obligations under the Contract Documents. These Bonds shall remain in effect at least until one (1) year after the date when final payment of the Contract becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. DESIGN-BUILDER shall also furnish such other Bonds as are required by the Supplementary Conditions.

B. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations. A certified copy of the agent's authority to act must accompany all Bonds signed by an agent.

C. If the surety on any Bond furnished by DESIGN-BUILDER is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirement of Paragraph 5.01 B, DESIGN-BUILDER shall within twenty (20) days thereafter substitute another Bond and surety, both of which must be acceptable to CITY.

5.02 Licensed Sureties and Insurers

A. All Bonds and insurance required by the Contract Documents to be purchased and maintained by CITY or DESIGN-BUILDER shall be obtained from surety or insurance companies that are duly licensed in the State of Missouri and in the jurisdiction in which the Project is located, if not in Missouri, to issue Bonds or insurance policies for the limits and coverages so required. All surety and insurance companies shall hold an A.M. Best rating of A-, V, or better.

5.03 Certificates of Insurance

A. DESIGN-BUILDER shall deliver to CITY, prior to the start of any Work at the Project Site, properly completed certificates of insurance or other evidence that the required insurance is in full force and effect, in a form acceptable to CITY. The receipt or acceptance of a certificate of insurance that does not incorporate the required terms and coverage shall not constitute a waiver by the City of the insurance requirements contained in the Contract Documents.

B. All policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained by DESIGN-BUILDER in accordance with Paragraphs 5.04 and 5.06 will contain waiver provisions in accordance with Paragraph 5.07 A. The certificates of insurance will contain a provision stating that should any of the policies described in the certificate be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

C. If the coverage afforded is cancelled or changed or its renewal is refused, DESIGN-BUILDER shall give at least thirty (30) days prior written notice to CITY and to each other additional insured to whom a certificate of insurance has been issued.

5.04 DESIGN-BUILDER's Liability Insurance

A. DESIGN-BUILDER shall purchase and maintain such liability and other insurance

as is appropriate for the Work being performed and furnished, and will provide protection from claims set forth below which may arise out of or result from DESIGN-BUILDER's performance and furnishing of the Work and DESIGN-BUILDER's other obligations under the Contract Documents, whether it is to be performed or furnished by DESIGN-BUILDER, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of DESIGN-BUILDER's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than DESIGN-BUILDER's employees;

4. claims for damages insured by customary personal injury liability coverage;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefore; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance so required by Paragraph 5.04 A, to be purchased and maintained shall:

1. with respect to insurance required by Paragraphs 5.04 A.3 through 5.04 A.5 inclusive, include as additional insureds (subject to any customary exclusion for professional liability) CITY, Consultants and any other individuals or entities identified in the Supplementary Conditions to be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in Paragraph 5.04 C or required by Laws or Regulations, whichever is greater;

3. include completed operations insurance;

4. include contractual liability insurance covering DESIGN-BUILDER's indemnity obligations;

5. remain in effect at least until final payment and at all times thereafter when DESIGN-BUILDER may be correcting, removing or replacing defective Work in accordance with Paragraphs 13.06 and 13.07;

6. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two (2) years after final payment (and DESIGN-BUILDER shall furnish CITY and each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance

has been issued evidence satisfactory to CITY and any such additional insured of continuation of such insurance);

7. contain a cross-liability or severability of interest clause or endorsement. Insurance covering the specified additional insureds shall be primary insurance, and all other insurance carried by the additional insureds shall be excess insurance;

8. with respect to commercial automobile liability, commercial general liability, and umbrella liability insurance, DESIGN-BUILDER shall require its insurance carrier(s) to waive all rights of subrogation against CITY, and CITY's officers, directors, partners, employees and agents; and

9. contain a provision or endorsement that the costs of providing the insureds a defense and appeal, including attorneys fees, as insureds, shall be supplementary and shall not be included as part of the policy limits but shall remain the insurer's responsibility.

C. Specific policies of insurance required by this Paragraph 5.04 shall include:

1. Workers' Compensation and Employers' Liability Insurance. This insurance shall protect DESIGN-BUILDER against all claims under applicable state workers''' compensation laws, including coverage as necessary for the benefits provided under the United States Longshoremen's and Harbor Workers' Act and the Jones Act. DESIGN-BUILDER shall also be protected against claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of workers' compensation laws. This policy shall include an "all states" or "other states" endorsement. The liability limits shall be not less than:

Workers' Compensation: Statutory

Employers' liability: $1,000,000 each occurrence

2. Commercial Automobile Liability Insurance. This insurance shall be occurrence type written in comprehensive form and shall protect DESIGN-BUILDER, and CITY, and Consultants against all claims for injuries to members of the public and damage to property of others arising from the use of motor vehicles, either on or off the Project Site, whether they are owned, non-owned, or hired.

The liability limits shall be not less than: $2,000,000

3. Commercial General Liability Insurance. This insurance shall be occurrence type written in comprehensive form acceptable to CITY. This insurance shall protect DESIGN-BUILDER, and CITY, and Consultants as additional insureds, against claims arising from injuries, sickness, disease, or death of any person or damage to property arising out of performance of the Work. The policy shall also include coverage for personal injury liability; contractual liability; completed operations and products liability; and for blasting, explosion, and collapse of buildings; and damage to underground property. The liability limits for bodily injury and property damage shall be not less than:

$2,000,000 combined single limit for each occurrence

$2,000,000 general aggregate.

4. Professional Liability Insurance with limits Per Claim/Annual Aggregate of $2,000,000.

5. The insurer’s costs of providing the insureds a defense and appeal as additional insureds, including attorney’s fees, shall be supplementary and shall not be included as part of the policy limits but shall remain the insurer’s separate responsibility.

5.05 CITY's Liability Insurance

A. In addition to the insurance required to be provided by DESIGN-BUILDER under Paragraph 5.04, CITY, at CITY's option, may purchase and maintain at CITY's expense liability insurance that will protect CITY against claims which may arise from operations under the Contract Documents.

5.06 Property Insurance

A. Unless otherwise provided in the Supplementary Conditions, DESIGN-BUILDER shall purchase and maintain property insurance on the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws or Regulations). This insurance shall:

1. include the interests of CITY, DESIGN-BUILDER, Subcontractors, and any other persons or entities identified in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, tornado, collapse, debris removal, demolition occasioned by enforcement of Laws or Regulations, water damage, damage caused by frost and freezing, and acts of God;

3. be maintained in effect until final payment is made unless otherwise agreed to in writing by CITY with thirty (30) days written notice to each other additional insured to whom a certificate of insurance has been issued.

B. CITY shall not be responsible for purchasing and maintaining any property insurance to protect the interests of DESIGN-BUILDER, Subcontractors or others involved in the Work to the extent of any deductible amounts. The risk of loss within the deductible amounts will be borne by DESIGN-BUILDER, Subcontractor or others suffering any such loss and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

5.07 Waiver of Rights

A. CITY and DESIGN-BUILDER intend that all policies purchased in accordance with Paragraphs 5.04 and 5.06 will protect CITY, DESIGN-BUILDER, CITY's Consultants, Subcontractors, and all other persons or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds in such policies and will provide primary coverage for all losses and damages caused by the perils covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery

against any of the insureds or additional insureds thereunder. CITY and DESIGN-BUILDER waive all rights against each other and their respective officers, directors, partners, employees and agents for all losses and damages caused by, arising out of or resulting from any of the perils covered by such policies and any other property insurance applicable to the Work, but only to the extent of insurance coverage; and, in addition, waive all such rights against CITY, Consultants, Subcontractors, and all other persons or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of any and each of them) under such policies for losses and damages so caused and covered by insurance. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by CITY as trustee or otherwise payable under any policy so issued. None of the above waivers shall apply if specifically in conflict with Laws and Regulations.

5.08 Receipt and Application of Insurance Proceeds

A. Any insured loss under the property insurance will be adjusted with CITY and made payable to CITY as fiduciary for the insureds, as their interests may appear, subject to the requirements of any indentures of indebtedness entered into by CITY.

B. CITY as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object to CITY's exercise of this power in writing within fifteen (15) days after the occurrence of loss. If such objection is made, CITY as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, CITY as fiduciary shall adjust and settle the loss with the insurers.

5.09 Partial Utilization - Property Insurance

A. If CITY finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work; provided that no such use or occupancy shall commence before the insurers providing the property insurance have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 DESIGN-BUILDER'S SERVICES AND RESPONSIBILITIES

6.01 General Requirements

A. Project Manager and Lead Architect. The Design-Build Project Manager and the Lead Architect shall be reasonably available to CITY's Representative and shall have the necessary expertise and experience required to supervise the Work. The Design-Build Project Manager and the Lead Architect shall communicate regularly with CITY's Representative. The Design-Build Project Manager, the Lead Architect, and any of the other Key Personnel identified in the Technical Approach Submittal portion of DESIGN-BUILDER's Bid may be removed or replaced only with the prior written consent of CITY.

B. Pre-Commencement Meeting. The parties will meet within ten (10) days after CITY's execution of the Contract to discuss issues affecting the administration of the Work and to implement the necessary procedures, including those relating to

schedules, submittals, and payment, to facilitate the ability of the parties to perform their obligations under the Contract Documents.

C. List of Subcontractors. DESIGN-BUILDER shall submit required information for all Subcontractors on Form 01290.09 - Subcontractor and Major Material Suppliers List, provided in these Contract Documents, prior to Subcontractor beginning Work at the Site. No acceptance by CITY of any Subcontractor or Sub-Subcontractor shall relieve DESIGN-BUILDER of its responsibility for scheduling and coordinating the Work of all Subcontractors and Sub-Subcontractors, nor shall it relieve DESIGN-BUILDER of its complete and exclusive responsibility and liability for all acts and omissions of any Subcontractor or Sub-Subcontractor, nor shall it result in any waiver of CITY's right to reject defective or nonconforming Work.

6.02 Professional Design Services

A. DESIGN-BUILDER shall, consistent with applicable Missouri licensing laws, perform or furnish, through the DOR and any Design Subconsultants, the necessary architectural, engineering, and other professional design services and the labor, materials, supervision, equipment, computers, documents, and other items and services necessary for the preparation of the required drawings, specifications, and other design information and submittals to permit DESIGN-BUILDER to complete the Work consistent with CITY's Project Design and Construction Criteria, the Contract Documents, and Legal Requirements. DESIGN-BUILDER acknowledges its responsibility to CITY for the proper performance of the Work by the DOR and Design Subconsultants and its responsibility for any of their acts or omissions in connection with the Work, and acknowledges that such subcontracting shall in no way relieve DESIGN-BUILDER of its obligations and liabilities under the Contract Documents and Legal Requirements. Nothing in the Contract Documents is intended or deemed to create any legal or contractual relationship between CITY and any Design Subconsultant, or between CITY and the DOR (unless the DOR is the DESIGN-BUILDER under contract with CITY), including, but not limited to, any third-party beneficiary rights, and a provision to such effect shall be inserted into all agreements between DESIGN-BUILDER and its Design Subconsultants and DOR (if the DOR is not the DESIGN-BUILDER under contract with CITY).

6.03 Design Standards; Seals and Endorsements

A. Design Standards. Except as otherwise directed in writing by CITY, DESIGN-BUILDER and the DOR shall use and implement in the performance of professional design services under the Contract, all applicable design standards required by federal, state, and local laws or codes or such standards as are recognized and used in the industry. In the development of any design under the Contract, DESIGN-BUILDER and the DOR shall comply with the Contract Documents and Legal Requirements, including, without limitation, all applicable provisions of the Americans with Disabilities Act, 42 U.S.C. Section 12101 et seq., as well as 28 C.F.R. Parts 35 and 36 and 29 C.F.R. Part 1630, and CITY's Buy American policy, all as may be amended from time to time. DESIGN-BUILDER and the DOR shall notify and explain to CITY any applicable exceptions under these acts or provisions.

B. Seals and Endorsements. The DOR shall affix its seal to and endorse all drawings, plans, and specifications, or estimates, and engineering data prepared by the DOR under the Contract. All Design Subconsultants shall similarly affix their seals to and endorse their respective drawings, plans, and specifications, or estimates, and

engineering data prepared for the Project.

C. Correction of Errors. DESIGN-BUILDER and the DOR shall monitor for quality assurance purposes all design services performed under the Contract, and shall immediately revise and correct the design drawings and plans at their own expense, without adjustment to the Contract Price and/or Contract Time(s), any act, omission, error, or oversight in the performance of such professional design services and the associated construction.

6.04 Standard of Care for Professional Design Services

A. The standard of care for all professional design services performed as part of the Work shall be the care and skill ordinarily exercised by members of the same design profession practicing under substantially similar conditions at the same time and locality of the Project, or as otherwise provided by Missouri law. Notwithstanding the preceding sentence, DESIGN-BUILDER shall design and construct the Project in such a manner that the Project and all of its components are functional and operational and in compliance with CITY's Project Design and Construction Criteria, Legal Requirements in effect as of the date of the Contract, and any other specific performance standards the parties may agree upon for any aspect of the Project.

6.05 Progress Schedule

A. DESIGN-BUILDER shall adhere to the progress schedule established in accordance with Article 2 as it may be adjusted from time to time as provided below:

1. DESIGN-BUILDER shall provide, at least once every thirty (30) calendar days, updated information on the project schedule, including thirty (30) day look ahead schedules, projected variances per event category and per Subcontractor, identification of all variances and calculation of the number of Days difference between the as-built critical path and the project schedule critical path

2. DESIGN-BUILDER shall, with each application for payment, provide completed monthly updated status report for the previous month on the project schedule and updated information indicating as-built and as-planned conditions. The updated information on the project schedule shall not modify any Milestone dates in the project schedule that CITY has previously approved. The updated information required is a condition precedent to payment pursuant to paragraph 14.02 and shall include at a minimum:

a concise statement of the outlook for meeting project schedule dates and the reasons for any change in outlook from the previous report;

b. a review of any significant technical problems encountered during the month;

c. an explanation of any corrective action taken or proposed; and

d. a summary of any Claims anticipated by DESIGN-BUILDER with respect to the Work, including the anticipated costs and schedule impacts of any such Claims.

6.06 Recovery Schedules

A. If the DESIGN-BUILDER should:

1. fail, refuse or neglect to supply a sufficient number of workers or to deliver the materials or equipment with such promptness as to prevent the delay in the

progress of the Work;

2. fail in any respect to commence and diligently prosecute the Work in accordance with the approved baseline project schedule in order to achieve substantial completion;

3. fail to commence, prosecute, finish, deliver or install the different portions of the Work on time as specified in the approved baseline project schedule; or

4. fail in the performance of any of the material covenants of the Contract Documents;

CITY shall have the right to direct the DESIGN-BUILDER, upon seven (7) calendar days notice, to prepare a written recovery plan, for CITY's approval, to accelerate the Work in order to conform to the approved baseline project schedule, including, without limitation, providing additional labor or expediting delivery of materials, performing overtime or re-sequencing the Work without adjustments to the Contract value. Upon CITY's approval of the recovery plan, DESIGN-BUILDER shall accelerate the Work in accordance with the plan.

B. Proposed recovery schedules shall be submitted to the CITY as a separate project plan for review and approval by CITY prior to incorporation into the approved baseline schedule. The recovery schedule shall be submitted in a format compatible with the baseline schedule format. Each proposed revision shall be submitted as a separate schedule, with the following minimum requirements:

1. A critical path method diagram showing revised and affected activities or Milestones.

2. An activity report for all revised and affected activities or Milestones.

C. Upon acceptance of the recovery schedule by CITY, data shall be added or revised for all new or revised activities and incorporated into the approved baseline project schedule.

6.07 Detailed Design Services

A. Interim Design Submissions. At the meeting contemplated by Section 6.07.B of these General Conditions of Contract, CITY and DESIGN-BUILDER shall, consistent with any applicable provision of the Contract Documents, agree upon any interim design submissions that CITY may wish to review, which interim design submissions may include design criteria, drawings, diagrams, and specifications setting forth the Project requirements.

B. Design Review Meetings. On or about the time of scheduled design submissions, DESIGN-BUILDER's Project Manager and Lead Architect shall convene design review meetings with CITY to confer about the submissions. At the meetings, DESIGN-BUILDER shall identify, among other things, the evolution of the design and any significant changes or deviations from CITY's Project Design and Construction Criteria or the Contract Documents, or, if applicable, previously submitted design submissions. In the event DESIGN-BUILDER believes that any changes requested by CITY at such meetings are inconsistent with CITY's Project Design and Construction Criteria or earlier approvals such that DESIGN-BUILDER's compliance with same may have an adverse impact on the Contract Price and/or the Contract Time(s), DESIGN-BUILDER shall submit its written notice to CITY specifying such impact within seven (7) days after such meeting, or DESIGN-BUILDER shall be deemed to have waived any

claim for adjustment to the Contract Price and/or the Contract Time(s) arising out of such meeting or request.

C. Approval of Interim Design Submissions. Following each design review meeting, DESIGN-BUILDER shall prepare and maintain meeting minutes and shall provide copies to all attendees for review. CITY shall review and approve the interim design submissions in a time that is consistent with the reasonable turnaround times set forth in DESIGN-BUILDER's approved schedule. Any such review and approval by CITY shall be only for purposes of determining the interim design submissions' apparent general consistency with CITY's Project Design and Construction Criteria, and shall not relieve DESIGN-BUILDER from any responsibility or liability for its complete and exclusive control and responsibility for providing complete and accurate design and construction services as required to achieve CITY's objectives, including, without limitation, the use, operation, and maintenance of the Project in conformance with CITY's Project Design and Construction Criteria, the Contract Documents, Legal Requirements, and applicable guidelines, requirements, and standards.

D. Construction Documents. DESIGN-BUILDER shall submit to CITY those Construction Documents consisting of drawings and specifications that describe and set forth in detail the requirements for construction of the Work. The Construction Documents shall be consistent with the latest set of interim design submissions; as such submissions may have been modified in a design review meeting and approved by CITY. The parties shall have a design review meeting to discuss, and CITY shall review and approve, the Construction Documents in accordance with the procedures and consistent with the purposes set forth in Sections 6.07.B. and 6.07.C. above and Section 6.07.E. below. Upon CITY's issuance of the Construction Notice to Proceed, DESIGN-BUILDER shall proceed with construction in accordance with the approved Construction Documents and shall submit to CITY, prior to commencement of construction, the number of copies of the approved Construction Documents, in the required form, as set forth in the Supplementary Conditions.

E. Approval of Construction Documents. CITY's review and approval of interim design submissions and the Construction Documents is for the purpose of mutually establishing a conformed set of Contract Documents compatible with the requirements of CITY's Project Design and Construction Criteria. Neither CITY's review and approval of any interim design submissions nor CITY's review and approval of the Construction Documents shall be deemed to transfer from DESIGN-BUILDER to CITY any of DESIGN-BUILDER's exclusive responsibility, control, and liability for the design and construction required under the Contract Documents.

F. Design Packages. To the extent not prohibited by the Contract Documents or Legal Requirements and with CITY's written approval, DESIGN-BUILDER may prepare interim design submissions and Construction Documents for a portion of the Work to permit construction to proceed on that portion of the Work prior to completion of the Construction Documents for the entire Work.

6.08 Legal Requirements

A. General. DESIGN-BUILDER shall perform the Work in accordance with the Contract Documents and Legal Requirements, and shall provide all notices applicable to the Work as required by the Contract Documents and the Legal Requirements

B. Changes in Legal Requirements. The Contract Price and/or Contract Time(s) may be equitably adjusted to compensate DESIGN-BUILDER for the effects of any

changes in Legal Requirements enacted after CITY's execution of the Contract that affect the performance of the Work. Such effects may include, without limitation, revisions DESIGN-BUILDER is required to make to the Construction Documents because of changes in Legal Requirements.

C. Americans with Disabilities Act. DESIGN-BUILDER agrees to comply, during the course of this Contract, with all provisions of the Americans with Disabilities Act, 42 U.S.C. Sec. 12101 et seq., as well as 28 C.F.R. Parts 35 and 36 and 29 C.F.R. Part 1630, as applicable and as amended from time to time.

D. Minority and Women's Business Enterprises. CITY is committed to ensuring that minority business enterprises (MBE) and women's business enterprises (WBE) participate to the maximum extent possible in the performance of CITY contracts. DESIGN-BUILDER shall comply with all requirements of CITY's Minority and Women's Business Enterprise Program as enacted in CITY's Code, Sections 38-84 through 38-100.4 and as hereinafter amended. DESIGN-BUILDER shall achieve the MBE/WBE participation goals set forth in DESIGN-BUILDER's Construction Contractor Utilization Plan/Request for Waiver (CITY's HRD Form 8-DB). DESIGN-BUILDER's compliance with this provision is a material part of this Contract.

E. Audit. The City Auditor, the CITY's Internal Auditor, the CITY's Director of Human Relations, and the CITY Department administering this Contract shall have the right to audit this Contract and all books, documents, and records relating thereto.

1. DESIGN-BUILDER shall maintain all of its books, documents, and records relating to this Contract during the Contract period and for three (3) years after the date of final payment or earlier termination of the Contract.

2. DESIGN-BUILDER shall make such books, documents, and records available to the City Auditor, the CITY's Internal Auditor, the CITY's Director of Human Relations, and the CITY Department administering this Contract, within ten (10) days after written request.

F. Prevailing Wage.

1. GENERAL CONTRACTOR shall comply and require its Subcontractors to comply with;

a. sections 290.210 to 290.340, RSMO the State of Missouri Prevailing Wage Law (the "Law"); and

b. 8 CSR 30-3.010 to 8 CSR 30-3.060, the Prevailing Wage Law Rules (the "Rules"); and

c. the Annual Wage Order (Wage Order) issued by the State of Missouri's Department of Labor and Industrial Relations; and

d. any applicable Annual Incremental Wage Increase (Wage Increase) to the Annual Wage Order.

2. The Law, Rules, Annual Wage Order and any Wage Increase are incorporated into and made part hereof this Contract and shall be collectively referred to in this Section as the "Prevailing Wage Requirements."

3. GENERAL CONTRACTOR shall pay and require its Subcontractors to pay to all workers performing work under this Contract not less than the prevailing hourly rate of wages for the class or type of work performed by the worker in accordance

with the Law, Rules, Wage Order and any applicable Wage Increase. GENERAL CONTRACTOR shall take whatever steps are necessary to insure that the prevailing hourly wage rates are paid and that all workers for GENERAL CONTRACTOR and each of its Subcontractors are paid for the class or type of work performed by the worker in accordance with the Prevailing Wage Requirements. If GENERAL CONTRACTOR shall fail to start to perform GENERAL CONTRACTOR's obligations under the Contract Documents within sixty (60) days from the date on which the Contract Times commenced to run, as indicated in the Notice to Proceed, GENERAL CONTRACTOR and each of its subcontractors shall be obligated to pay all workers in accordance with any new Wage Order, as subsequently amended by any applicable Wage Increase, issued by the Department of Labor and Industrial Relations within the aforementioned sixty (60) day period. The new Wage Order and any applicable Wage Increase shall govern notwithstanding the fact that the Wage Order being replaced might be physically attached or incorporated in the Contract Documents.

4. Prior to each of its Subcontractors beginning Work on the Site, GENERAL CONTRACTOR shall require each Subcontractor to complete CITY's Form 00490 entitled "Pre-contract Certification" that sets forth the Subcontractor's prevailing wage and tax compliance history for the two (2) years prior to the bid. GENERAL CONTRACTOR shall retain one (1) year and make the Pre-contract Certifications available to CITY within five (5) days after written request.

5. GENERAL CONTRACTOR shall keep and require each of its Subcontractors engaged in the construction of public works in performance of the Contract to keep full and accurate records on CITY's:

a. "Certified Payroll Report" Form indicating the worker's name, address, social security number, occupation(s) and craft(s) of every worker employed in connection with the public work together with the number of hours worked by each worker and the actual wages paid in connection with the Project; and

b. "Daily Labor Force Report" Form indicating the worker's name, occupational title or classification group & skill and the workers' hours. CITY shall furnish blank copies of the Daily Labor Force Report Form to GENERAL CONTRACTOR for its use and for distribution to Subcontractors; and

c. "Payroll Certification" Form. GENERAL CONTRACTOR shall prepare and shall require each Subcontractor to prepare a "Payroll Certification" Form to accompany the Certified Payroll Report. The Payroll Certification must be signed by the employee or agent who pays or supervises the payment of the workers employed under the Contract for the GENERAL CONTRACTOR and each Subcontractor.

d. Copies of CITY's "Certified Payroll Report" form, the Daily Labor Force Report and Payroll Certification Form are included in the Project Manual and are collectively referred to in this Section as the "Records."

6. GENERAL CONTRACTOR shall submit its and its Subcontractors Daily Labor Force Reports to CITY each day. GENERAL CONTRACTOR shall make all of CONTRACTOR's and Subcontractors' Records open to inspection by any authorized representatives of OWNER and the Missouri Department of Labor and Industrial Relations at any reasonable time and as often as they may be necessary and such Records shall not be destroyed or removed from the State of Missouri for a

period of one (1) year following the completion of the public work in connection with which the Records are made. GENERAL CONTRACTOR shall have its and its Subcontractors Certified Payroll Reports and Payroll Certifications available at the GENERAL CONTRACTOR's office and shall provide the Records to the City electronically at City's sole discretion. In addition, all Records shall be considered a public record and GENERAL CONTRACTOR shall provide the Records to the CITY in the format required by the CITY within three (3) working days of any request by CITY at the GENERAL CONTRACTOR's cost. CITY, in its sole discretion, may require GENERAL CONTRACTOR to send any of the Records directly to the person who requested the Record at GENERAL CONTRACTOR's expense.

7. GENERAL CONTRACTOR shall post and keep posted a clearly legible statement of all prevailing hourly wage rates to be paid to all workers employed by GENERAL CONTRACTOR and each of its Subcontractors in the performance of this Contract in a prominent and easily accessible place at the Site of the Work by all workers.

8. If the Contract Price exceeds $250,000.00, GENERAL CONTRACTOR shall and shall require each Subcontractor engaged in any construction of public works to have its name, acceptable abbreviation or recognizable logo and the name of the city and state of the mailing address of the principal office of the company, on each motor vehicle and motorized self-propelled piece of equipment which is used in connection with the Project during the time the GENERAL CONTRACTOR or Subcontractor is engaged on the project. The sign shall be legible from a distance of twenty (20') feet, but the size of the lettering need not be larger than two (2") inches. In cases where equipment is leased or where affixing a legible sign to the equipment is impractical, the GENERAL CONTRACTOR may place a temporary stationary sign, with the information required pursuant to this section, at the main entrance of the Project in place of affixing the required information on the equipment so long as such sign is not in violation of any state or federal statute, rule or regulation. Motor vehicles which are required to have similar information affixed thereto pursuant to requirements of a regulatory agency of the state or federal government are exempt from the provisions of this subsection.

9. GENERAL CONTRACTOR must correct any errors in GENERAL CONTRACTOR's or any Subcontractors' Records, or GENERAL CONTRACTOR's or any Subcontractors' violations of the Law, Rules, Annual Wage Order and any Wage Increase within fourteen (14) calendar days after notice from CITY.

10. GENERAL CONTRACTOR shall and shall require its Subcontractors to cooperate with the CITY and the Department of Labor and Industrial Relations in the enforcement of this Section, the Law, Rules, Annual Wage Order and any Wage Increase. GENERAL CONTRACTOR shall and shall require its Subcontractors to permit CITY and the Department of Labor and Industrial Relations to interview any and all workers during working hours on the Project at GENERAL CONTRACTOR's sole cost and expense.

11. GENERAL CONTRACTOR shall file with CITY, upon completion of the Project and prior to final payment therefore, affidavits from GENERAL CONTRACTOR and each of its Subcontractors, stating that each has fully complied with the provisions and requirements of the Missouri Prevailing Wage Law. CITY shall not make final payment until the affidavits, in proper form and order, from

GENERAL CONTRACTOR and each of its Subcontractors, are filed by GENERAL CONTRACTOR.

12. GENERAL CONTRACTOR shall forfeit as a statutory penalty to the CITY one hundred dollars ($100.00) for each worker employed, for each calendar day, or portion thereof, such worker is paid less than the prevailing hourly rates for any work done under this Contract, by GENERAL CONTRACTOR or by any of GENERAL CONTRACTOR's Subcontractors. If GENERAL CONTRACTOR or any of its Subcontractors have violated any section(s) of 290.210 to 290.340, RSMo, in the course of the execution of the Contract, CITY shall when making payments to the GENERAL CONTRACTOR becoming due under this Contract, withhold and retain therefrom all sums and amounts due and owing as a result of any violation of sections 290.210 to 290.340, RSMo.

G. Prevailing Wage Damages. GENERAL CONTRACTOR acknowledges and agrees that, based on the experience of CITY, violations of the Missouri Prevailing Wage Act, whether by GENERAL CONTRACTOR or its Subcontractors, commonly result in additional costs to CITY. GENERAL CONTRACTOR agrees that additional costs to CITY for any particular violation are difficult to establish and include but are not limited to: costs of construction delays, additional work for CITY, additional interest expenses, investigations, and the cost of establishing and maintaining a special division working under the City Manager to monitor prevailing wage compliance.

1. In the event of the failure by GENERAL CONTRACTOR or any of its Subcontractors to pay wages as provided in the Missouri Prevailing Wage Act, CITY shall be entitled to deduct from the Contract Price, and shall retain as liquidated damages, one hundred dollars ($100.00) per day, per worker who is paid less than the prevailing hourly rate of wages, to approximate the additional costs. The sum shall be deducted, paid or owed whether or not the Contract Times have expired.

2. CITY shall give written notice to GENERAL CONTRACTOR setting forth the workers who have been underpaid, the amount of the statutory penalty and the amount of the liquidated damages as provided for in this Subparagraph **J.** GENERAL CONTRACTOR shall have fourteen (14) calendar days to respond, which time may be extended by CITY upon written request. If GENERAL CONTRACTOR fails to respond within the specified time, the CITY's original notice shall be deemed final. If GENERAL CONTRACTOR responds to CITY's notice, CITY will furnish GENERAL CONTRACTOR a final decision in writing within five (5) days of completing any investigation.

H. Missouri Secretary of State Business Entity Registration. DESIGN-BUILDER shall obtain, from all Subcontractors and Sub-Subcontractors for the Project, a copy of their current certificate of good standing or fictitious name registration from the Missouri Secretary of State before they begin work on the Site. DESIGN-BUILDER shall retain such documents in its files and shall make them available to CITY within ten (10) days after written request.

I. Tropical Hardwoods. The provisions of Code Section 2-1872, restricting the use of tropical hardwoods, shall apply to this Contract.

J. Preference for Missouri Products. Pursuant to Section 71.140, RSMo, preference shall be given to materials, products, supplies, and all other articles produced, manufactured, made, or grown within the State of Missouri.

K. Open Excavations. DESIGN-BUILDER shall comply, and shall cause each of its Subcontractors to comply, with Legal Requirements and with the following specific requirements relating to open excavations; provided, however, that inclusion of these

requirements in the Contract Documents shall in no event result in CITY's responsibility or liability for any safety programs or precautions in connection with the Work, the Site, or the Project, as such responsibility and liability are exclusively those of DESIGN-BUILDER.

1. Protecting Excavations. DESIGN-BUILDER shall restore all required excavations to the level of the adjacent surfaces as soon as practicable. Unsupervised open excavations on public properties are discouraged at all times. If DESIGN-BUILDER, in performance of the Work, makes or causes to be made any excavation in, upon, under, through, or adjoining any street, sidewalk, alley, park, boulevard, parkway, or any other public properties, and leaves any part or portion thereof open, DESIGN-BUILDER shall provide effective protection for the public.

2. Securing Excavations. DESIGN-BUILDER shall protect and secure all excavations in roadways in compliance with existing federal, state, and local codes and standards, including, but not limited to, the most current edition of the Manual of Uniform Traffic Control Devices. DESIGN-BUILDER shall protect and secure all unsupervised excavations that are not within roadways, either by covering or fencing, in compliance with the following:

a. Covering. A protective cover that can sustain the weight of persons or objects placed upon it may be installed over an unsupervised excavation. The cover shall be secured to the ground to prevent movement. Protective covers shall have no opening(s) or protuberance(s) of sufficient size to cause or allow a fall and/or injury. Advance warning devices shall be installed as necessary.

b. Fencing. Fencing to prevent entry may be installed surrounding an unsupervised excavation that is not protectively covered in its entirety. The fencing shall be a minimum of 42” in height. The fencing shall be constructed in such a manner that it is adequately secured and will remain upright at all times under normal Site conditions.

c. Inspections. All protective coverings and fences over and around excavations shall be inspected at least daily to assure integrity. Protective coverings and/or fences in heavily trafficked areas shall be inspected more often as necessary.

L. Notification of Utilities. DESIGN-BUILDER shall adhere to the provisions of Sections 319.010 et seq., RSMo, which provide that a person or firm making an excavation in any public street, road or alley, right of way dedicated to public use, utility easement of record, or within any private street or private property may do so only after giving notice to, and obtaining information from, owners of Underground Facilities. Missouri’s 24-hour toll-free accident-prevention hotline number is 1-800-344-7483 (1-800-DIG-RITE).

M. Missouri Sales Tax Exemption. CITY is a Missouri exempt entity pursuant to Section 144.062, RSMo, and tangible personal property to be incorporated or consumed in the construction of the Project may be purchased without the payment of sales tax. CITY shall furnish to DESIGN-BUILDER a Missouri Project Exemption Certificate for Sales Tax at the time of issuance of the Notice to Proceed.

N. Clean Air Act and Clean Water Act. DESIGN-BUILDER shall comply with

requirements of the Clean Air Act (42 U.S.C. 7401 *et seq*.); Clean Water Act (33 U.S.C. 1251 *et seq*.), Missouri Clean Water Law (Chapter 644 RSMo), Code of Federal regulations (Title 40: Protection of Environment, Title 33: Navigation and Navigable Waters) and the rules of the Missouri Code of State Regulations (CSR Title 10).

O. OSHA 10-Hour Training Requirement. DESIGN-BUILDER and any subcontractor working under this Contract shall require every employee on the Site to complete a ten-hour construction safety program which meets the requirements of Section 292.675, RSMo, except for those employees who shall have previously completed the required program and hold documentation to that effect. DESIGN-BUILDER shall remove or require the removal of any person from the Site who is subject to this requirement and who does not complete or is unable to produce documentation of their successful completion of the required program within the time limitations prescribed by Section 292.675, RSMo. DESIGN-BUILDER shall forfeit the sum of two thousand five hundred dollars ($2,500.00), in addition to one hundred dollars ($100.00) per employee each calendar day, or portion thereof, the employee(s) shall continue to be employed without having completed the required program within the time limitations prescribed by Section 292.675, RSMo. CITY shall be entitled to withhold and retain any amounts due and owing hereunder when making payment to DESIGN-BUILDER.

P. Affirmative Action. If the Contract Price exceeds $300,000.00 and DESIGN-BUILDER employs fifty (50) or more people, DESIGN-BUILDER shall comply with City's Affirmative Action requirements in accordance with the provisions of Chapter 38 of City's Code, the rules and regulations relating to those sections, and any additions or amendments thereto. DESIGN-BUILDER shall not discriminate against any employee or applicant for employment because of race, color, sex, religion, national origin or ancestry, disability, sexual orientation, gender identity or age in a manner prohibited by Chapter 38 of City's Code.

DESIGN-BUILDER shall:

1. Submit, in print or electronic format, a copy of DESIGN-BUILDER'S current certificate of compliance to the City's Human Relations Department (HRD) prior to receiving the first payment under the contract, unless a copy has already been submitted to HRD at any point within the previous two calendar years. If, and only if, DESIGN-BUILDER does not possess a current certification of compliance, DESIGN-BUILDER shall submit, in print or electronic format, a copy of its affirmative action program to HRD prior to receiving the first payment under the contract, unless a copy has already been submitted to HRD at any point within the previous two calendar years.
2. Require any Subcontractor awarded a subcontract exceeding $300,000.00 to affirm that Subcontractor has an affirmative action program in place and will maintain the affirmative action program in place for the duration of the subcontract.
3. Obtain from any Subcontractor awarded a subcontract exceeding $300,000.00 a copy of the Subcontractor's current certificate of compliance and tender a copy of the same, in print or electronic format, to HRD within thirty (30) days from the date the subcontract is executed. If, and only if, Subcontractor does not possess a current certificate of compliance, DESIGN-BUILDER shall obtain a copy of the Subcontractor's affirmative action program and tender a copy of the same, in print or electronic format, to HRD within thirty (30) days from the date the subcontract is executed.

City has the right to take action as directed by City's Human Relations Department to enforce this provision. If DESIGN-BUILDER fails, refuses or neglects to comply with the provisions of Chapter 38 of City's Code, then such failure shall be deemed a total

breach of this Contract and this Contract may be terminated, canceled or suspended, in whole or in part, and DESIGN-BUILDER may be declared ineligible for any further contracts funded by City for a period of one (1) year. This is a material term of this Contract.

Q. Contract Information Management System. If applicable, DESIGN-BUILDER shall comply with CITY's Contract Information Management System requirements. DESIGN-BUILDER shall use CITY's Internet web based Contract Information Management System/Project Management Communications Tool provided by CITY, and protocols included in that software during the term of this Contract. DESIGN-BUILDER shall maintain user applications to CITY's provided system for all personnel, subcontractors or suppliers as applicable and shall require subcontractors/subconsultants to maintain same.

6.09 Government Approvals and Permits

A. DESIGN-BUILDER's Responsibility. DESIGN-BUILDER, at its own expense, shall secure all occupational and professional licenses; shall pay all Code application costs, Code review costs, governmental charges, and inspection fees; and shall secure from public or private sources or from any government or quasi-government entity having jurisdiction over the Project all necessary permits, approvals, and licenses required for the prosecution of the Work and necessary for the fulfillment of DESIGN-BUILDER's obligations under the Contract Documents.

B. DESIGN-BUILDER, at its own expense, shall comply with all Federal, State and local laws and regulations, including, but not limited to the Missouri Clean Water Law (Chapter 644 RSMo) together with any accompanying regulation(s) contained in the Missouri Code of State Regulations (CSR Title 10), as well as any implementing permits, together with any CITY Provisions during the life of this Contract including but not limited to:

1 Approvals and permits as required for construction or land disturbance activities.

2. Compliance with the State of Missouri – Department of Natural Resources ("MDNR") Missouri State Operating Permit ("Land Disturbance Permit"), MO-R100006 for all construction or land disturbance activity.

3. Development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

a. DESIGN-BUILDER shall not commence land disturbance activity until the initial SWPPP has been finalized.

b. Preparation and submittal of all applications, documentation and exhibits required to obtain MDNR approvals for uninterrupted Work at the Site.

c. Amending/Updating SWPPP.

d. Site Inspections and submittal of Inspection Reports

e. Proper Operation and Maintenance to achieve compliance with the terms of the Permit.

f. Maintenance of required records in accordance with MDNR requirements and requirements included in Article 6 of these Contract Documents.

4. In addition to requirements of Article 6, DESIGN-BUILDER shall also provide record access to Missouri Department of Natural Resources (MDNR).

5. No additional Contract time will be granted to obtain approvals or permits or for coordination with that agency

C. Subcontractors' Licenses. Before Subcontractors begin Work at the Site, DESIGN-BUILDER shall obtain copies of all licenses required of such Subcontractors by these Contract Documents. DESIGN-BUILDER shall retain such evidence in its files and make it available to CITY within ten (10) days after written request.

D. No Release from Responsibility. No review, inspection, or approval of any of the Work by any government or quasi-government entity having jurisdiction over the Project shall relieve DESIGN-BUILDER of its exclusive responsibility and liability for the performance of its obligations in accordance with the Contract Documents and Legal Requirements.

6.10 Construction Phase Services

A. DESIGN-BUILDER's Responsibility. Unless otherwise provided in the Contract Documents to be the responsibility of CITY or a separate contractor under CITY's control, DESIGN-BUILDER shall provide through itself or its Subcontractors the necessary supervision, labor, inspection, testing, start-up, material, equipment, machinery, temporary utilities, other temporary facilities, and all other items or services necessary to permit DESIGN-BUILDER to perform and complete the construction of the Project consistent with the Contract Documents and Legal Requirements.

B. DESIGN-BUILDER's Skill and Control. DESIGN-BUILDER shall perform all construction activities efficiently, in a workmanlike manner, and with the requisite expertise, skill, and competence to satisfy the Contract Documents and Legal Requirements. DESIGN-BUILDER shall at all times exercise complete and exclusive control over the means, methods, sequences, and techniques of construction, and all safety precautions and programs in connection with the performance of the Work.

C. Uncovering Work

1. Work Covered Improperly. If any Work (or the work of others at the Site) is covered contrary to the written request of CITY, DESIGN-BUILDER must uncover it at CITY's request for CITY's observation and replace it at DESIGN-BUILDER's expense.

2. Work Covered Properly. If CITY considers it necessary or advisable that covered Work be observed by CITY or be inspected or tested by others, DESIGN-BUILDER, at CITY's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as may be required, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

a. Defective Work. If it is found that such Work is defective, DESIGN-BUILDER shall pay all costs, losses, and damages (including, but not limited to, all fees and charges of contractors, engineers, architects, attorneys, and other professionals and all court or other dispute resolution costs) caused by, arising out of, or resulting from such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and CITY shall be entitled to an appropriate decrease in the Contract

Price. If the parties are unable to agree as to the amount thereof, CITY may make a Claim therefore.

b. Non-Defective Work. If, however, such Work is not found to be defective, DESIGN-BUILDER shall be allowed an increase in the Contract Price or an extension of the Contract Time(s) (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, DESIGN-BUILDER may make a Claim therefore.

D. Subcontractors

1. CITY's Approval. DESIGN-BUILDER shall engage only Subcontractors and Sub-subcontractors who are duly licensed and qualified to perform the Work consistent with the Contract Documents and Legal Requirements. Upon execution of the Contract and at such later times as CITY may request, DESIGN-BUILDER shall furnish, in writing, information about DESIGN-BUILDER's proposed Subcontractors and Sub-subcontractors. CITY shall promptly provide in writing any reasonable objections it may have to any such Subcontractor or Sub-subcontractor, in which case DESIGN-BUILDER shall submit an acceptable replacement. DESIGN-BUILDER shall not contract with any Subcontractor or Sub-subcontractor to which CITY objects, provided that the Contract Price and/or Contract Time(s) shall be equitably adjusted to the extent CITY's objection actually impacts DESIGN-BUILDER's cost and/or time of performance. DESIGN-BUILDER shall not be required to contract with any Subcontractor or Sub-Subcontractor against whom DESIGN-BUILDER has reasonable objection. CITY's consent or failure to object to any Subcontractor or Sub-subcontractor shall neither constitute any waiver by CITY of any of its rights and remedies under the Contract Documents or Legal Requirements, nor relieve DESIGN-BUILDER of any of its duties, obligations, liabilities, or warranties under the Contract Documents or Legal Requirements.

2. DESIGN-BUILDER's Subcontractors. DESIGN-BUILDER acknowledges its responsibility to CITY for the proper performance of the Work by DESIGN-BUILDER's Subcontractors and Sub-subcontractors and its responsibility for any of their acts or omissions in connection with the Work, and acknowledges that such subcontracting shall in no way relieve DESIGN-BUILDER of its obligations and liabilities under the Contract Documents and Legal Requirements.

3. Written Agreements. All Work performed by any Subcontractor or Sub-Subcontractor shall be pursuant to a written agreement or purchase order that specifically binds such Subcontractor or Sub-Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of CITY, and that affords to DESIGN-BUILDER the same rights against such Subcontractors and Sub-subcontractors as the Contract Documents afford to CITY against DESIGN-BUILDER. Nothing in the Contract Documents is intended or shall be construed to create any legal or contractual relationship between CITY and any Subcontractor or Sub-Subcontractor, nor to confer any benefit from CITY upon any Subcontractor or Sub-Subcontractor, including but not limited to any third-party beneficiary rights, and a provision to such effect shall be inserted into all subcontracts and purchase orders between DESIGN-BUILDER and its Subcontractors and Sub-subcontractors.

4. Contingent Assignment. Each agreement and purchase order referenced in Section 6.10.D.3 above shall include an express assignment to CITY upon the conditions that (1) such assignment is effective only in the event of CITY's termination of the Contract for cause pursuant to Section 12.3 of these General Conditions of Contract, (2) such assignment is effective only with respect to those agreements and purchase orders CITY accepts in writing, and (3) such assignment is subject to any prior rights of the surety obligated under the Bonds.

E. Coordination

1. DESIGN-BUILDER's Forces. DESIGN-BUILDER shall coordinate the activities of the DOR, the GC, all Design Subconsultants, all Subcontractors, and all Sub-subcontractors with respect to the Work. Such coordination shall include, but not be limited to, jobsite meetings involving all such Project participants, at dates and times mutually agreed upon in advance with CITY's Representative.

2. CITY's Forces. If CITY performs any work on the Project or at the Site with CITY's own forces or with separate contractors under CITY's control, DESIGN-BUILDER shall reasonably cooperate and coordinate its activities with those of such separate forces or contractors so that the Project can be completed in an orderly and coordinated manner without unreasonable disruption, delay, or damage to any party.

F. Supervision and Superintendence

1. DESIGN-BUILDER shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.

2. At all times during the progress of the Work, DESIGN-BUILDER shall assign a competent resident superintendent of the Work, who shall not be replaced without written request to and written approval by CITY except under extraordinary circumstances. The superintendent will be DESIGN-BUILDER's representative at the Site and shall have authority to act on behalf of DESIGN-BUILDER. All communications given to or received from the superintendent shall be binding on DESIGN-BUILDER.

G. Services, Working Hours, Labor, Materials, and Equipment

1. DESIGN-BUILDER shall provide competent, suitably qualified personnel to survey, layout, and construct the Work as required by the Contract Documents. DESIGN-BUILDER shall at all times maintain good discipline and order at the Site. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto. CITY's prior written approval shall be required in the event DESIGN-BUILDER intends to perform Work at the Site outside regular working hours.

2. Unless otherwise specified in the Contract Documents, DESIGN-BUILDER shall furnish and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work.

3. All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees shall expressly run to the benefit of CITY. If required by CITY, DESIGN-BUILDER shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment. All materials and equipment shall be stored, applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the manufacturer's instructions except as may be otherwise provided in the Contract Documents.

H. Use of Site and Other Areas

1. DESIGN-BUILDER shall confine its construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas identified in and permitted by the Contract Documents and other areas permitted by Legal Requirements. DESIGN-BUILDER shall not unreasonably encumber the Site and the other areas with construction equipment or other materials or equipment. DESIGN-BUILDER shall assume full responsibility for any damage to the Site or the other areas, or to the owner(s) or occupant(s) thereof, or of any adjacent land or areas, resulting from the performance of the Work.

2. Should any claim be made by any such owner(s) or occupant(s) because of the performance of the Work, DESIGN-BUILDER shall promptly resolve such claim. In case of a failure on the part of DESIGN-BUILDER to restore such property or to make good such damage or injuries, CITY may, upon forty-eight (48) hours' written notice to DESIGN-BUILDER, repair, rebuild, or otherwise restore such property as CITY may deem necessary, and the cost thereof will be deducted from any moneys due or which may become due to DESIGN-BUILDER under this Contract.

3. DESIGN-BUILDER shall, to the fullest extent permitted by Legal Requirements, defend, indemnify, and hold harmless CITY, its Consultant(s), and its or their officials, officers, directors, employees, and agents from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of contractors, engineers, architects, attorneys, and other professionals and all court or other dispute resolution costs) arising out of or resulting from any claim or action, legal or equitable, brought by any such owner(s) or occupant(s) against CITY or any other party indemnified hereunder to the extent caused by or based upon DESIGN-BUILDER's performance of the Work.

4. During the progress of the Work, DESIGN-BUILDER shall keep the Site and the other areas free from accumulations of waste materials, rubbish, and other debris resulting from the Work. DESIGN-BUILDER shall leave the Site clean and ready for utilization or occupancy by CITY at Substantial Completion of the Work. At the completion of the Work, DESIGN-BUILDER shall remove all waste materials, rubbish, and debris from the Site and the other areas, as well as all tools, appliances, construction equipment and machinery, and surplus materials. DESIGN-BUILDER shall restore to its pre-Work condition all property not designated for alteration by the Contract Documents.

DESIGN-BUILDER shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall DESIGN-BUILDER subject any part of the Site, the Work or adjacent property to stresses

or pressures that will endanger it or them.

I. Emergencies

1. In the event of emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, DESIGN-BUILDER, without special instruction or authorization from CITY, is obligated to act to prevent threatened damage, injury, or loss. DESIGN-BUILDER shall give prompt written notice to CITY if DESIGN-BUILDER believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If CITY determines that a change in the Contract Documents is required because of the action taken by DESIGN-BUILDER in response to an emergency, a Work Change Directive or Change Order will be issued.

2. A change in the Contract Documents pursuant to Section 6.10.I will not be an automatic authorization of, nor a condition precedent to, entitlement to adjustment to the Contract Price and/or Contract Time(s). If CITY and DESIGN-BUILDER are unable to agree on entitlement to, or magnitude of, an equitable adjustment to the Contract Price and/or Contract Time(s), a Claim may be made therefore. However, neither CITY nor its Consultant(s) shall be liable to DESIGN-BUILDER for any costs, losses, or damages (including but not limited to all fees and charges of contractors, engineers, architects, attorneys, and other professionals and all court or other dispute resolution costs) sustained by DESIGN-BUILDER on or in connection with any other project or anticipated project.

J. Access to the Work

1. CITY, its Consultant(s), other CITY representatives and personnel, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and Work at reasonable times for their observation, inspection, and testing of the Work. DESIGN-BUILDER shall afford proper and safe conditions for such access and shall advise of DESIGN-BUILDER's Site safety procedures and programs so that such persons and entities may comport themselves therewith as may be applicable.

K. Tests and Inspections

1. DESIGN-BUILDER shall give to CITY's Representative timely notice of readiness of the Work for all required inspections, tests, or approvals, and DESIGN-BUILDER shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

2. If any Work (or the work of others at the Site) that is to be inspected, tested, or approved is covered by DESIGN-BUILDER without written approval required by Sections 6.10.K.4 or 6.10.A, it must, if requested by CITY's Representative, be uncovered for observation.

3. Uncovering Work as provided in Section 6.10.K.2 shall be at DESIGN-BUILDER's expense unless DESIGN-BUILDER gave timely notice to CITY's Representative of DESIGN-BUILDER's intention to cover the same and CITY's Representative failed to act with reasonable promptness in response to such notice.

4. If Legal Requirements of any public body (including CITY) having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, DESIGN-BUILDER shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish the required certificates of inspection or approval to CITY's Representative.

5. DESIGN-BUILDER shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for CITY's acceptance of materials or equipment to be incorporated into the Work, or acceptance of materials, mix designs, or equipment submitted for approval prior to DESIGN-BUILDER's purchase thereof for incorporation into the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to CITY.

6. CITY shall engage and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

a. for inspections, tests or approvals covered by Sections 6.10.K.4 and 6.10.K.5;

b. that costs incurred in connection with tests or inspections conducted pursuant to Section 6.10.K.2 shall be paid as provided in Section 6.10.K.3; and

c. as otherwise specifically provided in the Contract Documents.

L. Clean Up

1. General. DESIGN-BUILDER shall keep the Site, including adjacent land areas and roads, reasonably free from debris, trash, mud, and construction wastes to permit DESIGN-BUILDER to perform its construction services efficiently and safely, and without interfering with the use of adjacent land areas and roads.

2. Regular Clean-Up Required. On a regular basis agreeable to CITY, DESIGN-BUILDER shall remove from CITY's property and from adjacent land areas and roads, and shall legally dispose of, all waste, trash, mud, and debris generated as a result of the Work performed under this Contract.

3. Disposal Records. DESIGN-BUILDER shall maintain written records of disposal methods and disposal sites, including, without limitation, copies of dump receipts or other forms provided by licensed landfills or agreements with property owners on whose property such waste materials are placed. DESIGN-BUILDER shall make such disposal records available to CITY within ten (10) working days from the date of CITY's written request therefore.

4. Substantial Completion. Upon Substantial Completion of the Work, or a portion of the Work, DESIGN-BUILDER shall remove all debris, trash, mud, construction wastes, materials, equipment, machinery, and tools arising from the Work or applicable portions thereof and shall leave the area "broom clean," to permit CITY to use or occupy the Project or a portion of the Project for its intended use.

5. CITY's Right to Clean Up. If DESIGN-BUILDER fails to provide the clean-up

of the Site as required by this Section 6.10.L, CITY, in its sole option, may have the required clean-up performed. All costs, losses, and damages (including but not limited to all fees and charges of contractors, engineers, architects, attorneys, and other professionals, and all court or other dispute resolution costs) caused by or resulting from such clean-up or other costs, losses, and damages incurred or sustained by CITY in exercising such rights and remedies will be charged against DESIGN-BUILDER.

6.11 DESIGN-BUILDER's Responsibility for Project Safety

A. Exclusive Responsibility. DESIGN-BUILDER recognizes the importance of performing the Work in a safe manner so as to prevent damage, injury, or loss to (i) all individuals at the Site, whether working or visiting; (ii) the Work, including materials and equipment incorporated into the Work or stored on-Site or off-Site; and (iii) all other property at the Site or adjacent thereto. DESIGN-BUILDER assumes complete and exclusive responsibility for implementing and monitoring all safety precautions and programs related to the performance of the Work. DESIGN-BUILDER's Safety Officer identified in the Technical Approach Submittal of DESIGN-BUILDER's Bid shall supervise the implementation and monitoring of all safety precautions and programs related to the Work. Unless otherwise required by the Contract Documents, DESIGN-BUILDER's Safety Officer shall be an individual stationed at the Site who may have responsibilities on the Project in addition to safety. The Safety Officer shall make routine daily inspections of the Site and shall hold weekly safety meetings with DESIGN-BUILDER's personnel, Subcontractors, and others as applicable. CITY may attend such meetings in its sole discretion, but CITY shall have no obligation to do so, and no responsibility or liability shall be imposed upon CITY for its attendance or failure to attend such meetings.

B. Accident Reporting. DESIGN-BUILDER and Subcontractors shall comply with Legal Requirements relating to safety, as well as any CITY-specific safety requirements set forth in the Contract Documents provided that such CITY-specific requirements do not violate any applicable Legal Requirements. DESIGN-BUILDER will immediately report in writing to CITY's Representative any safety-related injury, loss, damage, or accident arising from the Work and, to the extent mandated by Legal Requirements, to all government or quasi-government authorities having jurisdiction over safety-related matters involving the Project or the Work.

C. Subcontractors' Responsibility. DESIGN-BUILDER's responsibility for safety under this Section 6.9 and the Contract Documents and Legal Requirements is not intended in any way to relieve Subcontractors and Sub-Subcontractors of their own contractual and legal obligations and responsibility for (i) complying with Legal Requirements, including those related to health and safety matters; and (ii) taking all necessary measures to implement and monitor all safety precautions and programs to guard against injury, losses, damages, or accidents resulting from their performance of the Work.

6.12 DESIGN-BUILDER's Warranty

A. DESIGN-BUILDER warrants to CITY that the Work, including all workmanship, materials, and equipment furnished as part of the Work, shall be new unless otherwise specified in the Contract Documents, of good quality, in conformance with the Contract Documents, and free of defects in materials and workmanship. DESIGN-BUILDER's warranty obligation excludes defects caused by abuse, alterations, or failure to maintain

the Work by persons other than DESIGN-BUILDER or anyone for whose acts DESIGN-BUILDER may be liable. Nothing in this warranty is intended to limit any manufacturer's warranty providing CITY with greater warranty rights than set forth in this Section 6.10 or the Contract Documents. Upon Substantial Completion, DESIGN-BUILDER will provide CITY with all manufacturers' and products warranties associated with the Work, and shall provide assignments of such warranties to CITY if necessary.

6.13 DESIGN-BUILDER's Correction of Defective Work

A. One-Year Correction Period. If, (i) during the course of DESIGN-BUILDER's performance of its obligations under the Contract Documents; or (ii) within one (1) year after the date of Substantial Completion, or (iii) within such longer period of time as may be prescribed by Legal Requirements, by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the Site or other areas made available for DESIGN-BUILDER's use by CITY or permitted by Legal Requirements as contemplated in Section 6.08 is found to be defective, CITY shall give written notice thereof to DESIGN-BUILDER. Within seven (7) days after the date of CITY's written notice, DESIGN-BUILDER shall, without cost to CITY and in accordance with CITY's written instructions, complete the following corrective Work or, if such corrective Work cannot be completed within seven (7) days, DESIGN-BUILDER shall reasonably commence to perform, and shall complete within a reasonable time thereafter, the following corrective Work:

1. Correct the repair of damages to the Site or other areas; or

2. Correct such defective Work, or if it has been rejected by CITY, remove it from the Site and replace it with Work that is not defective; and

3. Satisfactorily correct or remove and replace any damage to other Work or to the work of others or damage to other lands or areas resulting therefrom.

B. Early Use of Equipment. In special circumstances where a particular item of equipment is placed into continuous service before Substantial Completion of all of the Work, the correction period for that item may start to run from an earlier date if so provided in the Contract Documents.

C. Additional One-Year Correction Period. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Section 6.13, the correction period with respect to such corrected or replaced Work will be extended for an additional period of one (1) year, or such longer period of time as may be prescribed within Section 6.13.A, after such correction or removal and replacement has been satisfactorily completed.

6.14 CITY's Acceptance of Defective Work

A. CITY's Sole Option. If, instead of requiring correction or removal and replacement of defective Work, CITY prefers to accept such defective Work, CITY may do so, in its sole discretion.

B. DESIGN-BUILDER's Costs. In the event CITY decides to accept such defective Work, DESIGN-BUILDER shall pay all costs, losses, and damages (including, but not limited to, all fees and charges of contractors, engineers, architects, attorneys, and other professionals, and all court or other dispute resolution costs) attributable to CITY's evaluation of and determination to accept such defective Work, and in addition

DESIGN-BUILDER shall pay CITY for the diminished value of the Work.

C. Deductive Change Order. If any such acceptance occurs prior to final payment, a Change Order will be issued incorporating the necessary revisions into the Contract Documents with respect to the Work and, due to the diminished value of the Work; CITY shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, CITY may make a Claim therefore.

D. Payment by DESIGN-BUILDER. If the acceptance of defective Work occurs after final payment, DESIGN-BUILDER shall pay the appropriate amount to CITY.

6.15 CITY's Correction of Defective Work

A. CITY's Right to Correct Work. If DESIGN-BUILDER fails, within the time period set forth in Section 6.13. above after written notice from CITY, to correct, or commence to correct, defective Work or to remove and replace, or commence to remove and replace, rejected Work as required by CITY, or if DESIGN-BUILDER fails to perform the Work in accordance with the Contract Documents and Legal Requirements, or if DESIGN-BUILDER fails to comply with any other provision of the Contract Documents or Legal Requirements, or in the event of an emergency where delay by DESIGN-BUILDER would cause serious risk of loss or damage, CITY, in its sole option, may have the defective Work corrected or the rejected Work removed and replaced.

B. CITY's Right to Take Possession. In connection with such corrective and remedial action, CITY may exclude DESIGN-BUILDER from all or part of the Site; take possession of all or part of the Work and suspend DESIGN-BUILDER's services related thereto; take possession of DESIGN-BUILDER's tools, appliances, construction equipment, and machinery at the Site; and incorporate into the Work all materials and equipment stored at the Site or for which CITY has paid DESIGN-BUILDER but which are stored elsewhere. DESIGN-BUILDER shall allow CITY, its Consultants, CITY's other contractors, and its or their agents and employees, access to the Site to enable CITY to exercise the rights and remedies under this Section 6.13.

C. DESIGN-BUILDER's Costs. All costs, losses, and damages (including but not limited to all fees and charges of contractors, engineers, architects, attorneys, and other professionals, and all court or other dispute resolution costs) caused by or resulting from such removal and replacement (including, but not limited to, all costs of repair or replacement of work of others destroyed or damaged by the correction, removal, and replacement of such defective or rejected Work) or other costs, losses, and damages incurred or sustained by CITY in exercising such rights and remedies will be charged against DESIGN-BUILDER.

D. Deductive Change Order. If such removal and replacement occurs prior to final payment, a Change Order will be issued and CITY shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, CITY may make a Claim therefore.

E. Payment by DESIGN-BUILDER. If such removal and replacement occurs after final payment, DESIGN-BUILDER shall pay the appropriate amount to CITY.

6.16 No Time Extension

A. DESIGN-BUILDER shall not be allowed an extension of the Contract Time(s) (or Milestones) because of any delay in the performance of the Work attributable to the exercise by CITY of CITY's rights and remedies under Sections 6.13, 6.14, and/or 6.15.

6.17. No Effect on Legal Requirements

A. The one-year period referenced in Section 6.13 applies only to DESIGN-BUILDER's obligation to correct defective or nonconforming Work, and such obligations are in addition to any other obligation or warranty imposed under the Contract Documents, Legal Requirements, or applicable law.

B. The provisions of Section 6.13 shall not be construed as a substitute for or waiver of the provisions of any applicable statute of limitations or repose, and the time period set forth in Section 6.13 does not constitute a period of limitations or repose for any other rights or remedies CITY may have under the Contract Documents, Legal Requirements, or applicable law with respect to enforcement of DESIGN-BUILDER's obligations.

6.18 Indemnification

A. For purposes of this Paragraph 6.18 only, the following terms shall have the meanings listed:

1. Claims means all claims, damages, liability, losses, costs and expenses, including court costs and reasonable attorneys' fees, including attorney's fees incurred by the CITY in the enforcement of this indemnity obligation.

2. DESIGN BUILDER'S Agents means DESIGN BUILDER's officers, employees, subconsultants, subcontractors, successors, assigns, invitees, and other agents.

3. CITY means CITY, its Program Manager/Construction Advisor and any of their agents, officials, officers, employees and program managers or construction advisors.

B. DESIGN BUILDER's obligations under this Paragraph with respect to indemnification for acts or omissions, including negligence, of CITY, shall be limited to the coverage and limits of insurance that DESIGN BUILDER is required to procure and maintain under this Contract. DESIGN BUILDER affirms that it has had the opportunity to recover the costs of the liability insurance required in this Contract in its contract price.

C. DESIGN BUILDER shall defend, indemnify and hold harmless CITY from and against all Claims arising out of or resulting from all acts or omissions in connection with this Contract caused in whole or in part by DESIGN BUILDER or DESIGN BUILDER's Agents, regardless of whether or not caused in part by any act or omission, including negligence, of OWNER.

D. In any and all Claims against CITY, DESIGN PROFESSIONAL, CONSULTANT, or any of their respective agents, officers, directors or employees by any employee (or the survivor or personal representative of such employee) of DESIGN BUILDER, any Subcontractor, any Supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.18 C shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for DESIGN BUILDER or any such Subcontractor, Supplier or other person or organization under workers' compensation acts, disability benefit acts or other employee benefit acts.

E. The indemnification obligations of DESIGN BUILDER under Paragraph 6.18 C shall not extend to liability arising out of, resulting from, or caused by the professional

negligence, errors or omissions of DESIGN PROFESSIONAL, CONSULTANT, or any of their respective agents, officers, directors or employees.

ARTICLE 7 OTHER WORK

7.01 Related Work at Site

A. CITY may perform other work related to the Project at the Site by CITY's own forces, or let other direct contracts therefore, or have other work performed by utility owners. If such other work is to be performed and such fact was not noted in the Contract Documents, then:

1. Written notice thereof will be given to DESIGN-BUILDER prior to starting any such other work, and

2. DESIGN-BUILDER may make a Claim therefore as provided in Article 15 if DESIGN-BUILDER believes that such performance involves additional expense to DESIGN-BUILDER or requires additional time and the parties are unable to agree as to the amount or extent thereof.

B. DESIGN-BUILDER shall afford each other contractor who is a party to such a direct contract, and each utility owner (and CITY, if CITY is performing the additional work with CITY's employees) proper and safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work and shall properly connect and coordinate the Work with theirs. Unless otherwise provided in the Contract Documents, DESIGN-BUILDER shall do all cutting, fitting and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. DESIGN-BUILDER shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of CITY and the others whose work will be affected. The duties and responsibilities of DESIGN-BUILDER under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of DESIGN-BUILDER in said direct contracts between CITY and such utility owners and other contractors.

C. If the proper execution or results of any part of DESIGN-BUILDER's Work depends upon work performed by others under this Article 7, DESIGN-BUILDER shall inspect such other work and promptly report to CITY and CITY in writing any delays, defects or deficiencies in such other work that render it unavailable or unsuitable for the proper execution or results of DESIGN-BUILDER's Work. DESIGN-BUILDER's failure to report same will constitute an acceptance of such other work as fit and proper for integration with DESIGN-BUILDER's Work, except for latent or non-apparent defects and deficiencies in such other work.

7.02 Coordination

A. If CITY contracts with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the person, firm or corporation who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, CITY shall have sole authority and responsibility in respect of such coordination.

ARTICLE 8 CITY'S RESPONSIBILITIES

8.01 Duty to Cooperate

A. CITY shall, throughout the performance of the Work, cooperate with DESIGN-BUILDER and perform CITY's responsibilities, obligations, and services in a reasonably timely manner to facilitate DESIGN-BUILDER's timely and efficient performance of the Work and so as not to unreasonably delay or interfere with DESIGN-BUILDER's performance of its obligations under the Contract Documents.

B. CITY shall provide DESIGN-BUILDER access to the Site, and CITY shall provide timely reviews and approvals of interim design submissions and Construction Documents consistent with the reasonable turnaround times set forth in DESIGN-BUILDER's schedule approved in writing by CITY as referenced in Section 2.5 of these General Conditions of Contract.

8.02 Furnishing of Services and Information

A. Unless stated to the contrary in the Contract Documents (including, without limitation, Article 4 hereof), CITY shall provide, at its own cost and expense, for DESIGN-BUILDER's information and use, the following, upon which DESIGN-BUILDER is entitled to rely in performing the Work unless otherwise stated in the information provided or in the Supplementary Conditions:

1. To the extent available, surveys describing the property, boundaries, topography, and reference points for use during construction, including existing service and utility lines;

2. Temporary and permanent easements, zoning, and other requirements and encumbrances affecting land use or necessary to permit the proper design and construction of the Project and enable DESIGN-BUILDER to perform the Work;

3. A legal description of the Site;

4. To the extent available, as-built and record drawings of any existing structures at the Site.

B. CITY is responsible for securing and executing all necessary agreements with adjacent land or property owners that are necessary to enable DESIGN-BUILDER to perform the Work. CITY is further responsible for all costs, including attorneys' fees, incurred in securing such agreements.

8.03 CITY's Representative

A. CITY's Representative shall be responsible for providing CITY-supplied information and approvals in a reasonably timely manner to permit DESIGN-BUILDER to fulfill its obligations under the Contract Documents. CITY's Representative shall also provide DESIGN-BUILDER with prompt notice if CITY's Representative observes any material failure on the part of DESIGN-BUILDER to fulfill its contractual obligations, including any errors, omissions, or defects in the performance of the Work.

8.04 CITY's Separate Contractors

A. CITY is responsible for all work performed on the Project or at the Site by

separate contractors under CITY's control (including, without limitation, separate architects and engineers CITY has engaged for the Project). CITY shall contractually require its separate contractors to cooperate with, and coordinate their activities so as not to interfere with, DESIGN-BUILDER in order to enable DESIGN-BUILDER to timely complete the Work consistent with the Contract Documents.

ARTICLE 9 CHANGES IN THE WORK

9.01 Authorized Changes in the Work

A. Without invalidating the Contract and without notice to any surety, CITY may, at any time or from time to time, order additions, deletions or revisions in the Work. Such additions, deletions or revisions will be authorized by a Written Amendment, a Change Order, or a Work Change Directive. Upon receipt of any such document, DESIGN-BUILDER shall promptly proceed with the Work involved that will be performed under the applicable conditions of the Contract Documents.

B. If CITY and DESIGN-BUILDER are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price pursuant to Article 10 or an adjustment of the Contract Times pursuant to Article 11 or both that should be allowed as a result of a Work Change Directive, a Claim may be made therefore as provided in Article 15.

9.02 Unauthorized Changes in the Work

A. DESIGN-BUILDER shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified or supplemented, except in the case of an emergency or in the case of uncovering Work.

9.03 Signing of Change Orders

A. CITY and DESIGN-BUILDER, shall sign appropriate Change Orders covering:

1. changes in the Work which are:

   a. ordered by CITY or

   b. required because of acceptance of defective Work or correcting defective Work.; or

   c. agreed to by the parties;

2. changes in the Contract Price or Contract Times or both which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times or both which embody the substance of any written decision approved by CITY, provided that, in lieu of signing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws or Regulations, but during any such appeal, DESIGN-BUILDER shall carry on the Work and adhere to the progress schedule..

9.04 Notification to Surety

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times or both) is required by the provisions of any Bond to be given to a surety, the

giving of any such notice will be DESIGN-BUILDER's responsibility, and the amount of each applicable Bond will be adjusted accordingly.

ARTICLE 10 CHANGE OF CONTRACT PRICE

10.01 Change of Contract Price

A. The Contract Price constitutes the total compensation payable to DESIGN-BUILDER for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by DESIGN-BUILDER shall be at DESIGN-BUILDER's expense without change in the Contract Price.

B. The Contract Price may only be changed by a Change Order. Any request for an adjustment in the Contract Price shall be based on written notice delivered within fourteen (14) calendar days after occurrence of the event giving rise to the request or within fourteen (14) calendar days after first recognition of the conditions giving rise to the request. Prior notice is not required for requests or claims relating to an emergency endangering life or property as described in Paragraph 6.16. Thereafter, the DESIGN-BUILDER shall submit written documentation of its request, including appropriate supporting documentation, within ten (10) calendar days after giving notice, unless the CITY grants an extension based on good cause shown by the DESIGN-BUILDER that such additional time is warranted.

C. The value of any Work covered by a Change Order or of any request for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by Unit Prices contained in the Contract Documents, by application of such Unit Prices to the quantities of the items involved (subject to the provisions of Paragraph 10.04); or

2. where the Work involved is not covered by Unit Prices contained in the Contract Documents, by a mutually agreed lump sum; or

3. where the Work involved is not covered by Unit Prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 10.01 C.2, on the basis of the Cost of the Work (determined as provided in Paragraphs 10.02 A and B) plus a DESIGN-BUILDER's fee for overhead and profit (determined as provided in Paragraph 10.01 D).

D. The DESIGN-BUILDER's fee allowed to DESIGN-BUILDER for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 10.02 A.1 and 10.02 A.2, the DESIGN-BUILDER's fee shall be ten percent (10%);

b. for costs incurred under Paragraph 10.02 A.3, the DESIGN-BUILDER's fee shall be five percent (5%);

c. where one or more tiers of subcontracts are on the basis of the Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 10.01 D.2 and 10.02 A.1 through A.3 is that the Subcontractor who actually performs or furnishes the Work, at whatever tier, will be a paid a fee of ten

percent (10%) of the costs incurred by such Subcontractor under Paragraphs 10.02 A.1 and 10.02 A.2 and that any higher tier Subcontractor and DESIGN-BUILDER will each be paid a fee of five percent (5%) of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 10.02 A.4, 10.02 A.5 and 10.02 B;

e. the amount of credit to be allowed by DESIGN-BUILDER to CITY for any change which results in a net decrease in cost will be the amount of the actual net decrease in costs plus a deduction in DESIGN-BUILDER's fee by an amount equal to five percent (5%) of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in DESIGN-BUILDER's fee shall be computed on the basis of the net change in accordance with Paragraphs 10.01 D.2.a through 10.01 D.2.e, inclusive.

E. Whenever the Cost of the Work is to be determined pursuant to Paragraphs 10.02 A and B, DESIGN-BUILDER shall establish and maintain records thereof in accordance with generally accepted accounting practices and submit in form acceptable to CITY an itemized cost breakdown together with supporting data.

10.02 Cost of the Work

A. The term "Cost of the Work" means the sum of all costs necessarily incurred and paid by DESIGN-BUILDER in the proper performance of the Work. When the value of any Work covered by a Change Order or when a request for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to DESIGN-BUILDER will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the request. Except as otherwise agreed to in writing by CITY, costs covered by Change Orders or requests shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any costs itemized in 10.02 B:

1. Payroll costs for employees in the direct employ of DESIGN-BUILDER in the performance of the Work, using occupational titles and job classifications agreed upon by CITY and DESIGN-BUILDER. Such employees shall include, without limitation, job Site superintendents, foremen and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing the Work after regular working hours, on Saturdays, Sundays or legal holidays shall be included in the above to the extent authorized by OWNER.

2. Cost of all materials and equipment furnished and incorporated into the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to DESIGN-BUILDER unless CITY deposits funds with DESIGN-BUILDER with which to make payments, in which case the cash discounts shall accrue to CITY. All trade discounts, rebates and refunds and returns from sale of surplus materials and

equipment shall accrue to CITY, and DESIGN-BUILDER shall make provisions so that they may be obtained.

3. Payments made by DESIGN-BUILDER to Subcontractors for Work performed or furnished by Subcontractors. If required by CITY, DESIGN-BUILDER shall obtain competitive bids from Subcontractors acceptable to OWNER and DESIGN-BUILDER and shall deliver such bids to CITY who will then determine, with the advice of CITY, which bids, if any, will be accepted. If any subcontract provides that the Subcontractor is to be paid on the basis of the Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as DESIGN-BUILDER's Cost of the Work and fee as provided in Paragraphs 10.01 D and E and 10.02 A and B. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys and accountants) employed for services specifically related to the Work when such services are approved in advance by CITY in writing.

5. Other costs including the following:

a. The proportion of necessary transportation, travel and subsistence expenses of DESIGN-BUILDER's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the Site and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value of such items used but not consumed which remain the property of DESIGN-BUILDER.

c. Rentals of all construction equipment and machinery and the parts thereof whether rented from DESIGN-BUILDER or others in accordance with rental agreements approved by CITY, and the costs of transportation, loading, unloading, installation, assembly, dismantling and removal thereof, all in accordance with the terms of said rental agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work.

d. Applicable sales, consumer, use or similar taxes related to the Work*,* and for which DESIGN-BUILDER is liable, imposed by Laws or Regulations.

e. Deposits lost for causes other than negligence of DESIGN-BUILDER, any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses required to perform the Work.

f. Losses and damages (and related expenses) caused by damage to the Work*,* not compensated by insurance or otherwise, sustained by DESIGN-BUILDER in connection with the performance and furnishing of the Work (except losses and damages within the deductible amounts of property insurance established by CITY in accordance with Article 5), provided they have resulted from causes other than the negligence of DESIGN-BUILDER, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include

settlements made with the written consent and approval of CITY. No such losses, damages and expenses shall be included in the Cost of the Work for the purpose of determining DESIGN-BUILDER's fee. If, however, any such loss or damage requires reconstruction and DESIGN-BUILDER is placed in charge thereof, DESIGN-BUILDER shall be paid for those services a fee proportionate to that stated in Paragraph 10.01 D.2.

g. The cost of utilities, fuel and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expressage and similar petty cash items in connection with the Work.

i. Cost of premiums for additional or increased Bonds, or for insurance required because of approved changes in the Work.

B. Costs excluded: The term "Cost of the Work" shall not include any of the following:

1. Payroll costs and other compensation of DESIGN-BUILDER's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks and other personnel employed by DESIGN-BUILDER whether at the Site or in DESIGN-BUILDER's principal or a branch office for general administration of the Work (if not specifically included in the agreed upon occupational titles and job classifications referred to in Paragraph 10.02 A.1 or specifically covered by Paragraph 10.02 A.4), all of which are to be considered administrative costs covered by the DESIGN-BUILDER's fee.

2. Expenses of DESIGN-BUILDER's principal and branch offices other than DESIGN-BUILDER's office at the Site.

3. Any part of DESIGN-BUILDER's capital expenses, including interest on DESIGN-BUILDER's capital employed for the Work and charges against DESIGN-BUILDER for delinquent payments.

4. Costs due to the negligence of DESIGN-BUILDER, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials, or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 10.02 A.

10.03 Cash Allowances

A. It is understood that DESIGN-BUILDER has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be furnished and performed for such sums as may be acceptable to CITY. DESIGN-BUILDER agrees that:

1. the allowances include the cost to DESIGN-BUILDER (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. DESIGN-BUILDER's costs for unloading and handling on the Site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

B. Prior to final payment, an appropriate Change Order will be issued by CITY to reflect actual amounts due DESIGN-BUILDER on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

10.04 Unit Price Work

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Contract. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price.

B. Each unit price will be deemed to include an amount considered by DESIGN-BUILDER to be adequate to cover DESIGN-BUILDER's overhead and profit for each separately identified item.

C. CITY or DESIGN-BUILDER may negotiate an adjustment of the price per unit of Unit Price Work stated in the Contract if:

1. the quantity of any item of Unit Price Work performed by DESIGN-BUILDER differs by twenty percent (20%) or more from the estimated quantity of such item indicated in the Contract; and

2. there is no corresponding adjustment with respect to any other item of Work; and

3. DESIGN-BUILDER believes that DESIGN-BUILDER is entitled to an increase in Contract Price as a result of having incurred additional expense or CITY believes that CITY is entitled to a decrease in Contract Price.

10.05 Dispute Resolution

A. If CITY and DESIGN-BUILDER are unable to agree on entitlement to, or magnitude of, an equitable adjustment in the Contract Price in accordance with Article 10 within fourteen (14) calendar days from the receipt of supporting documentation of the request pursuant to 10.01.B., unless the CITY grants an extension based on good cause shown by the DESIGN-BUILDER that such additional time is warranted, then a Claim for such adjustment may be made pursuant to Article 15.

ARTICLE 11 CONTRACT TIMES

11.01 Time of the Essence

A. All times stated in the Contract Documents are of the essence of the Contract.

11.02 Change of Contract Times

A. The Contract Times (or Milestones) may only be changed by a Change Order. Any request for an adjustment in the Contract Times shall be based on

written notice delivered within fourteen (14) calendar days after occurrence of the event giving rise to the request or within fourteen (14) calendar days after first recognition of the conditions giving rise to the request. Thereafter, the DESIGN-BUILDER shall submit written documentation of its requests, including appropriate supporting documentation, within ten (10) days after giving notice, unless the CITY grants an extension based on good cause shown by the DESIGN-BUILDER that such additional time is warranted.

11.03 Proof Required To Justify An Extension of Time For Excusable and Compensable Delays

A. In support of any request for an extension of the Contract Times pursuant to this Article, DESIGN-BUILDER must demonstrate to the reasonable satisfaction of the CITY that the critical path of the approved baseline project schedule was delayed. DESIGN-BUILDER shall be entitled to an increase in contract time for the number of days that the critical path was delayed solely as a result of the compensable or excusable event. A compensable or excusable event includes, but is not limited to:

1. unreasonable delay of issuance of Notice to Proceed by CITY;

2. CITY's unreasonable delay of delivery furnished materials, equipment, or work;

3. unreasonable delay responding to shop drawings and submittals;

4. CITY's unreasonable delay in issuing a Change Order;

5. an order by the CITY to stop the Work where the DESIGN-BUILDER was not at fault; and

6. other reasonable grounds as determined by the CITY in its sole discretion.

B. DESIGN-BUILDER shall compare the critical path of the approved baseline project schedule to the actual critical path of the Work, identifying the specific impact of the compensable or excusable event.

C. DESIGN-BUILDER shall submit to the CITY a written time impact analysis illustrating the influence of each compensable or excusable event on the date of Substantial Completion. The time impact analysis shall demonstrate the time impact based on the date of the delay in time and the event time computations or all affected activities.

D. If the critical path of the Work is delayed by "Force Majeure", the DESIGN-BUILDER shall be entitled only to an extension of the Contract Times for the number of days of delay to the critical path. For purposes of this paragraph, "Force Majeure" shall mean fire, tornado, flood, earthquake, war, act of terrorism, civil disturbance, or labor strikes away from the project site.

E. Extensions of contract time pursuant to the this section will be granted only to the extent that the time adjustments exceed the total float time available when the event causing the delay occurred.

11.04 Delays Within DESIGN-BUILDER's Control

A. The Contract Times (or Milestones) will not be extended due to delays within the control of DESIGN-BUILDER. Delays attributable to and within the control of a

Subcontractor or Supplier shall be deemed to be delays within the control of DESIGN-BUILDER.

11.05 Delays Beyond the CITY's and DESIGN-BUILDER's Control

A. Where DESIGN-BUILDER is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of both CITY and DESIGN-BUILDER, an extension of the Contract Times (or Milestones) in an amount equal to the time lost due to such delay shall be DESIGN-BUILDER's sole and exclusive remedy for such delay.

11.06 Delay Damages

A. In no event shall CITY be liable to DESIGN-BUILDER, any Subcontractor, any Supplier, any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from:

1. delays caused by or within the control of DESIGN-BUILDER, or

2. delays beyond the control of CITY or DESIGN-BUILDER including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God or acts or neglect by utility owners or other contractors performing other work as contemplated by Article 7.

B. Nothing in this Paragraph 11.06 bars a change in Contract Price pursuant to this Article 11 to compensate DESIGN-BUILDER due to delay, interference, or disruption directly attributable to actions or inaction of CITY, CITY's Consultant or anyone for whom CITY, or CITY's Consultant is responsible.

11.07 Dispute Resolution

A. If CITY and DESIGN-BUILDER are unable to agree on entitlement to, or magnitude of, an equitable adjustment in the Contract Time in accordance with Article 11 within fourteen (14) calendar days from the receipt of supporting documentation of the request pursuant to 11.02, unless the CITY grants an extension based on good cause shown by the DESIGN-BUILDER that such additional time is warranted, then a Claim for such adjustment may be made pursuant to Article 15.

ARTICLE 12 TESTS AND INSPECTIONS;
CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

12.01 Access to Work

A. CITY, CITY's Consultants, other representatives and personnel of CITY, independent testing laboratories and governmental agencies with jurisdictional interests will have access to the Site and Work at reasonable times for their observation, inspecting and testing. DESIGN-BUILDER shall provide them proper and safe conditions for such access and advise them of DESIGN-BUILDER's Site safety procedures and programs so that they may comply therewith as applicable.

12.02 Tests and Inspections

A. DESIGN-BUILDER shall give CITY and CITY's Representative timely notice of readiness of the Work for all required inspections, tests or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. If any Work (or the work of others at the Site) that is to be inspected, tested or approved is covered by DESIGN-BUILDER without written approval required by Paragraphs 12.02 D or 12.02 E, it must, if requested by CITY's Representative, be uncovered for observation.

C. Uncovering Work as provided in Paragraph 12.02 B, shall be at DESIGN-BUILDER's expense unless DESIGN-BUILDER has given CITY and CITY's Representative timely notice of DESIGN-BUILDER's intention to cover the same and CITY and CITY's Representative have not acted with reasonable promptness in response to such notice.

D. If Laws or Regulations of any public body (including CITY) having jurisdiction require any Work (or part thereof) specifically to be inspected, tested or approved by an employee or other representative of such public body, DESIGN-BUILDER shall assume full responsibility for arranging and obtaining such inspections, tests or approvals, pay all costs in connection therewith, and furnish CITY and CITY's Representative the required certificates of inspection or approval.

E. DESIGN-BUILDER shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests or approvals required for CITY's and CITY's acceptance of materials or equipment to be incorporated into the Work, or acceptance of materials, mix designs, or equipment submitted for approval prior to DESIGN-BUILDER's purchase thereof for incorporation into the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to CITY.

F. CITY shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests or approvals covered by Paragraph 12.02 D and E;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 12.04 B shall be paid as provided in said Paragraph 12.04 B; and

3. as otherwise specifically provided in the Contract Documents.

12.03 Notice of Defects

A. Prompt notice of all defective Work of which the CITY has actual knowledge will be given to DESIGN-BUILDER. Defective Work may be rejected, corrected or accepted as provided in this Article 12.

12.04 Uncovering Work

A. If any Work (or the work of others at the Site) is covered contrary to the written request of CITY or CITY's Representative, it must, if requested by CITY's Representative, be uncovered for CITY's or CITY's Representative's observation and replaced at DESIGN-BUILDER's expense.

B. If CITY considers it necessary or advisable that covered Work be observed by CITY or CITY's Representative or be inspected or tested by others, DESIGN-BUILDER, at CITY's request, shall uncover, expose or otherwise make available for observation, inspection or testing as may be required, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is defective, DESIGN-BUILDER shall pay all costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all

court or arbitration or other dispute resolution costs) caused by, arising out of or resulting from such uncovering, exposure, observation, inspection and testing and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and CITY shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, CITY may make a Claim therefore as provided in Article 15. If, however, such Work is not found to be defective, DESIGN-BUILDER shall be allowed an increase in the Contract Price or an extension of the Contract Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement and reconstruction. If the parties are unable to agree as to the amount or extent thereof, DESIGN-BUILDER may make a Claim therefore as provided in Article 15.

12.05 CITY May Stop the Work

A. If the Work is defective, or DESIGN-BUILDER fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, CITY may order DESIGN-BUILDER to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of CITY to stop the Work shall not give rise to any duty on the part of CITY to exercise this right for the benefit of DESIGN-BUILDER, any SubDESIGN-BUILDER, Supplier, other individual or entity or any surety or employee or agent of any of them.

12.06 Correction or Removal of Defective Work

A. If required by CITY, DESIGN-BUILDER shall promptly, as directed, either correct all defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by either CITY or CITY's Representative, remove it and replace it with Work that is not defective. DESIGN-BUILDER shall pay all costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) caused by or resulting from such correction or removal (including but not limited to all costs of repair or replacement of work of others).

12.07 Correction Period

A. If within one (1) year after the date of Substantial Completion, or such longer period of time as may be prescribed by Laws or Regulations, by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for DESIGN-BUILDER's use by CITY or permitted by Laws and Regulations as contemplated in Paragraph 6.10 is found to be defective, DESIGN-BUILDER shall promptly, without cost to CITY and in accordance with CITY's written instructions:

1. correct the repair of damages to such land or areas; or

2. correct such defective Work, or if it has been rejected by CITY, remove it from the Site and replace it with Work that is not defective; and

3. satisfactorily correct or remove and replace any damage to other Work or to the work of others or damage to other lands or areas resulting therefrom. If DESIGN-BUILDER does not promptly comply with the terms of such instructions, or in the event of an emergency where delay by DESIGN-BUILDER would cause serious risk of loss or damage, CITY may have the defective Work corrected or

the rejected Work removed and replaced, and all costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) caused by or resulting from such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by DESIGN-BUILDER.

B. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment.

C. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 12.07, the correction period hereunder with respect to such Work will be extended for an additional period of one (1) year, or such longer period of time as may be prescribed within Paragraph 12.07 A, after such correction or removal and replacement has been satisfactorily completed.

D. DESIGN-BUILDER's obligations under this Paragraph 12.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 12.07 shall not be construed as a substitute for or waiver of the provisions of any applicable statute of limitation or repose.

12.08 Acceptance of Defective Work

A. If, instead of requiring correction or removal and replacement of defective Work, CITY prefers to accept it, CITY may do so. DESIGN-BUILDER shall pay all costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to CITY's evaluation of and determination to accept such defective Work and shall pay OWNER for the diminished value of the Work. If any such acceptance occurs prior to CITY's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions into the Contract Documents with respect to the Work and, due to the diminished value of the Work, CITY shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, CITY may make a Claim therefore as provided in Article 15. If the acceptance of defective Work occurs after such recommendation, an appropriate amount shall be paid by DESIGN-BUILDER to CITY.

12.09 CITY **May Correct Defective Work**

A. If DESIGN-BUILDER fails within a reasonable time after written notice from CITY or CITY's Representative to correct defective Work or to remove and replace rejected Work as required by CITY in accordance with Paragraph 12.06, or if DESIGN-BUILDER fails to perform the Work in accordance with the Contract Documents, or if DESIGN-BUILDER fails to comply with any other provision of the Contract Documents, CITY may, after seven (7) days written notice to DESIGN-BUILDER, correct and remedy any such deficiency.

B. CITY shall proceed expeditiously when exercising the rights and remedies under this Paragraph 12.09. In connection with such corrective and remedial action, CITY may exclude DESIGN-BUILDER from all or part of the Site; take possession of all or part of the Work and suspend DESIGN-BUILDER's services related thereto; take possession of DESIGN-BUILDER's tools, appliances, construction equipment and machinery at the

Site; and incorporate into the Work all materials and equipment stored at the Site or for which CITY has paid DESIGN-BUILDER but which are stored elsewhere. DESIGN-BUILDER shall allow CITY, CITY's Representative, agents and employees, CITY's other contractors, CITY and Consultants access to the Site to enable CITY to exercise the rights and remedies under this Paragraph 12.09.

C. All costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by CITY in exercising such rights and remedies will be charged against DESIGN-BUILDER and a Change Order will be issued incorporating the necessary revisions into the Contract Documents with respect to the Work; and CITY shall be entitled to an appropriate decrease in the Contract Price. If CITY and DESIGN-BUILDER are unable to agree as to the amount thereof, CITY may make a Claim therefore as provided in Article 15. Such Claims for costs, losses and damages will include but not be limited to all costs of repair or replacement of work of others destroyed or damaged by correction, removal and replacement of DESIGN-BUILDER's defective or rejected Work.

D. DESIGN-BUILDER shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to the exercise by CITY of CITY's rights and remedies under Paragraphs 12.06 and 12.09.

ARTICLE 13 PAYMENTS TO DESIGN-BUILDER AND COMPLETION

13.01 Schedule of Values

A. Pursuant to Paragraph 2.06.A.3, DESIGN-BUILDER shall submit to CITY a Schedule of Values allocating the Contract Price among the various elements of the construction portion of the Work. The Schedule of Values shall be prepared on CITY's form, with such detail and supported by such data and documentation as CITY may require. The Schedule of Values shall be used as a guideline for CITY's review of DESIGN-BUILDER's Applications for Payment for the construction portion of the Work.

13.02 Monthly Progress Payments

A. On or before the date established in the Contract Documents, DESIGN-BUILDER shall submit, for CITY's review and approval, DESIGN-BUILDER's Application for Payment, on CITY's form, requesting payment for all Work performed as of the date of the Application for Payment. The Application for Payment shall be complete and accurate and accompanied by all supporting documentation required by the Contract Documents and/or established at the meeting contemplated by Section 6.01.B of these General Conditions of Contract, including, without limitation, certified payrolls in form and substance acceptable to CITY. CITY shall have the right to review all design services and construction services, performed at the Site or elsewhere, to determine whether the quantity and quality of labor, services, equipment, and materials are as required by the Contract Documents and as represented in the Application for Payment.

B. If payment is requested on the basis of materials and equipment not incorporated into the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, paid invoice, or other documentation warranting that CITY has received the materials and equipment free and clear of all liens and claims, and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements

to protect CITY's interest therein, all of which will be subject to CITY's approval.

C. The Application for Payment shall constitute DESIGN-BUILDER's representation that the Work has been performed consistent with the Contract Documents and Legal Requirements, has progressed to the Design Milestone or portion of the Schedule of Values indicated in the Application for Payment, and that title to all Work will pass to CITY free and clear of all claims, liens, encumbrances, and security interests upon the incorporation of the Work into the Project, or upon DESIGN-BUILDER's receipt of payment under the Application for Payment for that portion of the Work, whichever occurs earlier.

13.03 Payment; Withholding of Payment

A. On or before the date established in the Contract Documents, CITY shall pay DESIGN-BUILDER all amounts properly due under the Application for Payment. No payment to DESIGN-BUILDER by CITY, nor any use or occupancy of the Project or any part thereof by CITY, shall be interpreted or construed to constitute CITY's acceptance of any Work not in conformance with the Contract Documents or Legal Requirements, and shall not be held to prevent the maintenance of an action on DESIGN-BUILDER's Bonds or insurance, or against DESIGN-BUILDER directly, for failure to perform said Work in conformance with the Contract Documents and Legal Requirements. DESIGN-BUILDER expressly accepts the risk that defective Work may not be detected (1) during any review by CITY, (2) prior to CITY making any payment to DESIGN-BUILDER, or (3) prior to CITY's occupancy of the Project or any part thereof.

B. If CITY determines that DESIGN-BUILDER is not entitled to payment for all or part of an Application for Payment, CITY will notify DESIGN-BUILDER in writing. The notice shall indicate the specific amounts withheld, the reasons and contractual basis for the withholding, and the specific measures DESIGN-BUILDER must take to rectify CITY's concerns. Such reasons for withholding payment under an interim Application for Payment or under the Application for Final Payment shall include, but not be limited to, the following acts or omissions: (i) the assessment of liquidated damages; (ii) unsatisfactory Project progress; (iii) defective design or construction Work or materials not remedied; (iv) disputed Work; (v) failure to comply with any material provision of the Contract Documents or Legal Requirements; (vi) third party claims filed or reasonable evidence that a claim will be filed; (vii) failure to make timely payments for labor, services, equipment, or materials; (viii) damage to CITY's separate contractor, or to a Design Subconsultant, Subcontractor, or Sub-subcontractor, (ix) reasonable evidence that a Design Subconsultant, a Subcontractor, or a Sub-subcontractor cannot be fully compensated under its contract with the DESIGN-BUILDER; (x) evidence that the remaining portion of the Work cannot be completed in accordance with the Contract Documents and Legal Requirements for the unpaid balance of the Contract Price, (xi) overstatement of amounts included in any Application for Payment, (xii) losses caused by DESIGN-BUILDER, (xiii) DESIGN-BUILDER's failure or refusal to perform any of its obligations to CITY, (xiv) citation by any enforcing authority for acts or omissions of the DESIGN-BUILDER which do not comply with the Contract Documents and/or which result in a violation of any Legal Requirements, or (xv) any other reason listed in the Prompt Pay Act. In the event an insufficient amount is due to DESIGN-BUILDER under the current Application for Payment, CITY may make written demand for the return of an amount believed by CITY to be adequate to cover CITY's potential liabilities and damages arising from DESIGN-BUILDER's specified act or omission, and DESIGN-BUILDER shall promptly comply with such demand. DESIGN-BUILDER and CITY will

attempt to resolve CITY's concerns prior to the date payment is due.

C. CITY shall pay DESIGN-BUILDER all undisputed amounts in an Application for Payment within the times required by the Contract Documents and applicable law, including the Prompt Pay Act.

13.04 DESIGN-BUILDER's Payment Obligations

A. In accordance with its contractual obligations to such parties and in conformance with Missouri law, including, without limitation, the Prompt Pay Act, DESIGN-BUILDER will pay to Design Consultants and Subcontractors all amounts received by DESIGN-BUILDER from CITY on account of their services and work. DESIGN-BUILDER will impose similar requirements on its Design Subconsultants and Subcontractors to pay those parties with whom they have contracted. No subcontract or other agreement arising from this Contract shall include, by either express or implied terms, a "pay when paid" or "pay if paid" clause. Any such clause is against CITY policy and shall be considered null and void.

B. To the fullest extent permitted by Legal Requirements, DESIGN-BUILDER shall defend, indemnify, and hold harmless CITY, its Consultant(s), and its or their officials, officers, directors, employees, and agents from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of contractors, engineers, architects, attorneys, and other professionals and all court or other dispute resolution costs) arising out of or resulting from any claims for payment and/or mechanic's liens.

13.05 Substantial Completion

A. DESIGN-BUILDER shall notify City in writing when DESIGN-BUILDER believes the Work or, to the extent permitted in the Contract Documents, a portion of the Work, has achieved Substantial Completion, and shall submit to CITY a list of items remaining to be completed or corrected. Within ten (10) working days after CITY's receipt of DESIGN-BUILDER's notice, CITY and DESIGN-BUILDER will jointly inspect such Work to determine whether it is substantially complete in accordance with the requirements of the Contract Documents and Legal Requirements, including the issuance of all necessary certificates of occupancy or other authorizations for the use or occupancy of the Project required by any government or quasi-government authority having jurisdiction over the Project.

B. If CITY determines that such Work is substantially complete, CITY shall prepare and issue a Certificate of Substantial Completion, signed by DESIGN-BUILDER to acknowledge the responsibilities assigned to it, that will set forth (i) the date of Substantial Completion of the Work or portion thereof, (ii) the remaining items of Work and the date on which they must be completed or corrected before final payment shall become due, (iii) provisions (to the extent not already set forth in the Contract Documents) establishing CITY's and DESIGN-BUILDER's responsibility for the Project's security, maintenance, utilities, damage to the Work, and insurance pending final payment, and (iv) an acknowledgment that warranties commence to run on the date of Substantial Completion, except as may otherwise be noted in the Certificate of Substantial Completion.

C. Upon Substantial Completion of the entire Work or, if applicable, any portion of the Work, and upon receipt and approval of DESIGN-BUILDER's Application for Payment therefor, CITY shall release to DESIGN-BUILDER all retained amounts

relating, as applicable, to the entire Work or completed portion of the Work, less all offsets and deductions authorized by the Contract Documents or by applicable law, and less an amount equal to two hundred percent (200%) of the reasonable value of all remaining or incomplete items of Work as noted in the Certificate of Substantial Completion.

D. Prior to Substantial Completion of all of the Work, CITY, at its sole option, may use or occupy a portion of the Work which has been determined to have achieved Substantial Completion provided that (i) a Certificate of Substantial Completion has been issued for that portion of Work, (ii) DESIGN-BUILDER and CITY have obtained the consent of their sureties and insurers, and, to the extent applicable, the appropriate government or quasi-government authorities having jurisdiction over the Project, including, without limitation, the issuance of all necessary certificates of occupancy, and (iii) CITY and DESIGN-BUILDER agree that CITY's use or occupancy will not interfere with DESIGN-BUILDER's completion of the remaining Work. Such partial use or occupancy shall not be construed to mean that the entire Project has achieved Substantial Completion.

13.06 Final Completion; Final Payment

A. DESIGN-BUILDER shall notify CITY in writing when DESIGN-BUILDER believes that all of the Work is finally complete and ready for CITY's final inspection. Within ten (10) working days after CITY's receipt of DESIGN-BUILDER's notice, CITY and DESIGN-BUILDER will jointly inspect the Work to determine whether the Work is finally complete in accordance with the requirements of the Contract Documents and Legal Requirements and whether the Contract has been fully performed.

B. At the time of submission of its Application for Final Payment, and as a condition precedent to final payment, DESIGN-BUILDER shall provide the following, in form and substance acceptable to CITY:

1. An affidavit that there are no claims, obligations, or liens outstanding or unsatisfied for labor, services, materials, equipment, taxes, or other items performed, furnished, or incurred for or in connection with the Work which might in any way affect CITY's interests, and an agreement to defend and indemnify CITY against any of same.

2. A general release executed by DESIGN-BUILDER under oath, waiving, upon receipt of final payment, all claims against CITY, except those claims previously made in writing to CITY by DESIGN-BUILDER, still pending at the time of the Application for Final Payment, and specifically identified in the general release as unsettled at the time of the Application for Final Payment;

3. Consent of DESIGN-BUILDER's surety to final payment;

4. One complete record set, both in electronic form and on a reproducible medium acceptable to CITY, of all Contract Documents and submittals;

5. All operating manuals, instruction manuals, maintenance manuals, product and manufacturers' warranties, and other documents, things, and deliverables required by the Contract Documents;

6. Certificates of insurance confirming that required coverages and limits of liability are and will remain in effect consistent with the requirements of the Contract Documents; and

7. A “Contractor Affidavit for Final Payment” from DESIGN-BUILDER and a “Subcontractor Affidavit for Final Payment” from all Subcontractors and Sub-subcontractors, regardless of tier.

C. After receipt of DESIGN-BUILDER's Application for Final Payment, and provided that DESIGN-BUILDER has completed all of the Work and provided all documents and information in conformance with the Contract Documents and Legal Requirements, CITY shall make final payment to DESIGN-BUILDER within the time required in the Contract Documents and pursuant to applicable Missouri law.

D. Upon making final payment, CITY waives all claims against DESIGN-BUILDER except claims relating to (i) DESIGN-BUILDER’s failure to satisfy its payment obligations, if such failure affects CITY's interests, (ii) DESIGN-BUILDER’s failure to perform and complete the Work consistent with the Contract Documents and Legal Requirements, including defects appearing after Substantial Completion, and (iii) the terms of any special warranties required by the Contract Documents.

ARTICLE 14 SUSPENSION OF WORK AND TERMINATION

14.01 CITY May Suspend Work

A. Notwithstanding any other provision of this Contract, at any time and without cause, and at is sole and absolute discretion, CITY, may suspend the Work or any portion of the Work by written notice to CONTRACTOR, which will initially fix the date on which Work will be resumed. DESIGN-BUILDER shall resume the Work on the date so fixed in the notice unless the date is changed by a subsequent written notice from CITY. DESIGN-BUILDER may be allowed an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any suspension if DESIGN-BUILDER makes a Claim therefore in accordance with Article 15.

B. DESIGN-BUILDER will not be allowed an adjustment in the Contract Price or an extension of the Contract Times if CITY suspends the Work because DESIGN-BUILDER’s acts or omissions create or cause an emergency that CITY believes affects the safety or protection of persons, the Work, or property at the Site or adjacent thereto. CITY may order DESIGN-BUILDER to stop the Work, or any portion thereof, until the cause for such order has been adequately addressed by DESIGN-BUILDER; however, this right of CITY to stop the Work shall not give rise to any duty on the part of CITY to exercise this right for the benefit of DESIGN-BUILDER, any Subcontractor, Supplier, other individual or entity or any surety or employee or agent of any of them.

14.02 CITY May Terminate for Default

A. DESIGN-BUILDER may be deemed in default and CITY may terminate the services of DESIGN-BUILDER upon the occurrence of any one or more of the following events:

1. DESIGN-BUILDER fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under Paragraph 2.06 and 2.07 as adjusted from time to time pursuant to Paragraphs 6.05, 6.06, 11.02 and 11.03);

2. DESIGN-BUILDER abandons the Work or declares its intention to abandon the work;

3. DESIGN-BUILDER assigns or attempts to assign its rights or obligations under this Contract or any part thereof to any third party without the prior written consent of CITY;

4. DESIGN-BUILDER fails to make prompt payment duly owing to any subcontractor or material supplier within thirty (30) calendar days after payment was due;

5. DESIGN-BUILDER fails to achieve the required dates of substantial and final completion;

6. DESIGN-BUILDER disregards Laws or Regulations of any public body having jurisdiction;

7. DESIGN-BUILDER disregards the authority of CITY or OWNER; or

8. DESIGN-BUILDER otherwise violates in any substantial way any provisions of the Contract Documents.

B. CITY may, after giving DESIGN-BUILDER (and the surety) seven (7) days written notice and to the extent permitted by Laws or Regulations, terminate the services of DESIGN-BUILDER, exclude DESIGN-BUILDER from the Site and take possession of the Work and of all DESIGN-BUILDER's tools, appliances, construction equipment and machinery at the Site and use the same to the full extent they could be used by DESIGN-BUILDER (without liability to DESIGN-BUILDER for trespass or conversion), incorporate into the Work all materials and equipment stored at the Site or for which CITY has paid DESIGN-BUILDER but which are stored elsewhere, and finish the Work as CITY may deem expedient. In such case, DESIGN-BUILDER shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by CITY arising out of or resulting from completing the Work, such excess may be paid to DESIGN-BUILDER. If such costs, losses and damages exceed such unpaid balance, DESIGN-BUILDER shall pay the difference to CITY within fourteen (14) calendar days of CITY'S demand for payment. When exercising any rights or remedies under this Paragraph CITY shall not be required to competitively bid this work unless required by law.

C. Where DESIGN-BUILDER's services have been so terminated by CITY, the termination will not affect any rights or remedies of CITY against DESIGN-BUILDER then existing or which may thereafter accrue. Any retention or payment of moneys due DESIGN-BUILDER by CITY will not release DESIGN-BUILDER from liability.

D. If, after a default termination, it is determined that the DESIGN-BUILDER was not in default, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the CITY. The CITY shall then be liable to DESIGN-BUILDER for only those costs enumerated in paragraph 14.03.

14.03 CITY May Terminate for Convenience

A. Notwithstanding any other provision of this Contract, upon seven (7) calendar days written notice to DESIGN-BUILDER, CITY may, at its sole and absolute discretion, without cause and without prejudice to any other right or remedy of CITY, elect to terminate the Contract. In such case, DESIGN-BUILDER shall, with thirty (30) calendar days of receiving notice of termination under this paragraph, submit to CITY its

statement of costs and expenses and shall be paid:

1. for completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. for expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. for all costs, losses and damages incurred in settlement of terminated contracts with Subcontractors, Suppliers and others; and

4. for reasonable expenses directly attributable to termination if approved in advance by CITY.

B. DESIGN-BUILDER shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

C. DESIGN-BUILDER waives any costs not submitted to CITY pursuant to paragraph 14.03.A.

D. CITY shall, within thirty (30) calendar days after receipt of DESIGN-BUILDER's statement, pay DESIGN-BUILDER all amounts it determines are properly determined.

ARTICLE 15 CLAIMS AND DISPUTES

15.01 Definition

A. A Claim is a demand or assertion by the DESIGN-BUILDER seeking, as a matter of right, the adjustment of Contract price and/or times with respect to the terms of the Contract.

15.02 Written Notice and Burden of Proof

A. Claims must be made by written notice pursuant to Article 16.01. The written notice shall clearly indicate that the DESIGN-BUILDER is making a claim. The responsibility to substantiate Claims shall rest with the DESIGN-BUILDER. No Claim may be made under this Contract except as provided in this Article.

B. Certification of Claim: The written notice of Claim shall include the following statement signed by the DESIGN-BUILDER's representative: "The DESIGN-BUILDER certifies that all statements made and the facts set out in this claim are true and correct and that no false records have been submitted in support of this claim." **Strict compliance with this paragraph shall be a condition precedent to the creation, existence or validity of any Claim**.

15.03 Time Limits on Claims

A. The DESIGN-BUILDER must give notice to the CITY within fourteen (14) calendar days after the denial of a request for or failure to reach an agreement on a change in Contract Price and/or change in Contract Time pursuant to Article 10 and Article 11 respectively. After the fourteen (14) day period for making Claims has expired, the Claim shall be considered waived.

B. The DESIGN-BUILDER shall submit the Claim to the CITY's Representative.

15.04 Continuing Contract Performance

A. Pending final resolution of a Claim, unless otherwise agreed in writing, the DESIGN-BUILDER shall proceed diligently with performance of the Work and the CITY

shall continue to make payments in accordance with the Contract Documents. The CITY may, but is not obligated to, notify the Surety of the nature and amount of the Claim.

15.05 Injury or Damage to Person or Property

A. If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, of any of the other party's employees or agents, or of others for whose acts that party is legally liable, written notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding thirty (30) days after first observance. The notice shall provide sufficient detail to enable the other party to investigate the matter.

15.06 Initial Resolution of Claims and Disputes

A. After the DESIGN-BUILDER has submitted the Claim to the CITY's Representative, the CITY'S Representative and DESIGN-BUILDER'S Representative shall conduct a settlement conference within fourteen (14) calendar days from the date of receipt of the Claim. If the Claim is not settled within seven (7) calendar days following the date of the settlement conference, the CITY'S Representative and the DESIGN-BUILDER's Representative shall state, in writing, following the conclusion of the seven (7) calendar day period, their respective position as to the matters in dispute.

B. The CITY'S and DESIGN-BUILDER'S statement of positions shall state all known factual grounds for each party's position. If the dispute remains unresolved at the end of the seven (7) calendar days from submission of the parties' written position statements, the DESIGN-BUILDER shall have the right to proceed with the pursuit of Claims pursuant to paragraph 15.07.

C. If a Claim has been resolved, the OWNER will prepare or obtain appropriate documentation.

15.07 Final Resolution of Claims and Disputes

A. All administrative procedures set forth in this contract must first be exhausted before suit is filed.

B. If the CITY'S Representative and the DESIGN-BUILDER'S Representative are unable to resolve the dispute pursuant to 15.06, the parties must submit their statements of position to the Director, who shall review the Claim and make a decision within fourteen (14) calendar days.

C. Absent fraud, gross mistake or bad faith, the Director's decision shall be final and binding on CITY and DESIGN-BUILDER within fourteen (14) calendar days after issuance. The DESIGN-BUILDER shall give written notice to the CITY stating its intent to submit its Claim to a court of law pursuant to paragraph 16.05.A. within thirty (30) calendar days after notice of Director's decision.

D. The time frames for the Director's decision and for DESIGN-BUILDER'S written notice of intent may be by participation in voluntary mediation. Mediator selection and the procedures to be employed in voluntary mediation shall be mutually acceptable to the parties. Costs of the mediator shall be shared equally among the parties participating in the mediation. In no event shall any time frame be tolled more than 30 days for mediation. However, mediation may be employed at any time at the discretion and mutual agreement of the parties.

E. If the dispute is not resolved during voluntary mediation, The DESIGN-BUILDER agrees that it will file no suit based on facts or evidentiary materials that were not presented for consideration to the CITY during the mediation process or of which the DESIGN-BUILDER had knowledge and failed to present during the administrative procedures.

ARTICLE 16 MISCELLANEOUS

16.01 Giving Notice

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be given by personal delivery, by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice or by confirmed electronic facsimile transmission. Notice is effective on the date of personal delivery, deposit of registered or certified mail, postage prepaid, or confirmed electronic facsimile transmission.

16.02 Computation of Times

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last calendar day of such period. If the last day of such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

16.03 Cumulative Remedies

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon DESIGN-BUILDER and all of the rights and remedies available to CITY and CITY hereunder are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply.

16.04 Survival of Obligations

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract.

16.05 Controlling Law

A. This Contract shall be construed and governed in accordance with the laws of the State of Missouri without giving effect to Missouri's choice of law provisions. The CITY and DESIGN-BUILDER: (1) shall submit exclusively to the jurisdiction of the state and federal courts located in Jackson County, Missouri and no other; (2) shall waive any and all objections to jurisdiction and venue; and (3) shall not raise forum non-conveniens as an objection to the location of any litigation.

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

DESIGN-BUILD SUPPLEMENTARY CONDITIONS

Project Number **80002542 / C9909**

Project Title **WTP House Service Main**

These Supplementary Conditions amend or supplement the General Conditions of the Construction Contract and other provisions of the Contract Documents as indicated below. All provisions that are not so amended or supplemented remain in full force and effect.

SC-2.03 A. Article 2, Paragraph 2.03, Copies of Documents, is amended by deleting Paragraph 2.03 A and replacing it with the following:

A. CITY shall furnish to DESIGN-BUILDER up to two (2) copies of the Drawings and Specifications, including Addenda.

SC-4.02 Article 4, Paragraph 4.02, Subsurface and Physical Conditions; Subparagraphs A and B are supplemented as follows:

In the preparation of the Contract Documents, the following drawings of physical conditions in or relating to existing surface or subsurface structures (except Underground Facilities) which are at or contiguous to the Site of the Work were utilized:

1. Drawing dated 2024, prepared by City of Kansas City, MO; entitled **Water Treatment Plant Basemap**, which may be reviewed at upon request.
2. Drawing dated 2024, prepared by City of Kansas City, MO; entitled **Pipe Gallery Demolition**, which may be reviewed at upon request.
3. Drawings dated 1990, prepared by City of Kansas City, MO; entitled **Rehabilitation of Natural Gas, Fuel Oil, Water and Carbon Dioxide Piping at the Water Treatment Plant**, which may be reviewed at upon request.
4. Drawings dated 1955, prepared by Burns & McDonnell; entitled **New Final Basin No. 3 – Contract C-125**, which may be reviewed at upon request.
5. Drawings dated 1953, prepared by Burns & McDonnell; entitled **Recarbonation Facilities – Contract C-109**, which may be reviewed at upon request.

SC-4.06 Article 4, Paragraph 4.06, Asbestos, Lead-Based Paint, PCBs, Petroleum Waste or Radioactive Material, Subparagraphs A and B are supplemented as follows:

In the preparation of the Contract Documents, no reports of explorations and tests of any Hazardous Environmental Condition(s) at the Site of the Work were utilized.

SC- 5.01 A. Article 5, Paragraph 5.01, Performance, Payment and Other Bonds, Subparagraph A, second sentence, is revised as follows:

These Bonds shall remain in effect at least until **three (3) years** after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents.

SC-5.03 A. Article 5, Paragraph 5.03 Certificates of Insurance, Subparagraph A is amended by adding the following Subparagraph 1:

1. DESIGN-BUILDER shall obtain evidence that all Subcontractors have in force general, automobile, and employer's and workers' compensation liability insurance in the

amounts required by these Contract Documents, and evidence that each is current on its unemployment insurance payments before Subcontractors begin Work at the Site. DESIGN-BUILDER shall retain such evidence in its files and make available to CITY within ten (10) days after written request.

SC-5.04 C. Article 5, Paragraph 5.04, DESIGN-BUILDER's Liability Insurance, Subparagraph C is amended as follows:

The following additional policies of insurance are required:

6. Environmental Liability Insurance. This insurance shall protect DESIGN-BUILDER, and CITY, DESIGN PROFESSIONAL and Consultants as additional insureds, against claims for injuries to members of the public and damage to the property of others resulting from environmental impairment. The liability limits of the environmental policy shall not be less than $2,000,000.

7. Asbestos Liability Insurance. This insurance shall be an "occurrence" policy and shall protect DESIGN-BUILDER, and CITY, DESIGN PROFESSIONAL and Consultants as additional insureds, against all claims arising from bodily injury, sickness, disease or death of any person other than the DESIGN-BUILDER's employees arising out of any act related to asbestos abatement work. The liability limits for bodily injury and property damage shall be not less than:

$1,000,000 each occurrence

$2,000,000 general aggregate.

If DESIGN-BUILDER provides Environmental or Asbestos Liability Insurance through a Subcontractor, DESIGN-BUILDER shall contractually require the Subcontractor to include CITY as additional insured in the Subcontractor's policy. DESIGN-BUILDER shall deliver to CITY, prior to the start of any Work at the Project Site, properly completed certificates of insurance or other evidence that the required insurance is in full force and effect, in a form acceptable to CITY. DESIGN-BUILDER shall contractually require its Subcontractor to defend, indemnify and hold harmless CITY from and against all Claims arising out of or resulting from all acts or omissions in connection with this Contract caused in whole or in part by Subcontractor or Subcontractor's agents, regardless of whether or not caused in part by any act or omission, including negligence, of CITY. DESIGN-BUILDER must provide evidence that this requirement has been complied in accordance with the provisions of Paragraphs 6.01 B and 6.06 G.

SC-5.06 A. Article 5, Paragraph 5.06, Property Insurance, Paragraph A, is amended by adding the following after the first sentence:

Property Insurance on the Work at the Site shall be written with a deductible amount not to exceed $10,000.00.

SC-6.01 A. Article 6, Paragraph 6.01, Subparagraph A, is supplemented as follows.

Design-Build Project Engineer shall be reasonably available to CITY's Representative and shall have the necessary expertise and experience required to supervise the Work. The Design-Build Project Engineer shall communicate regularly along with the Design-Build Project Manager and Lead Architect.

If the project does not require a Lead Architect, the Design-Build Project Manager and Design-Build Project Engineer shall satisfy all communication and availability requirements.

SC-6.10. Article 6., Construction Phase Services, shall be amended by adding the following Paragraph 6.10, Subparagraph F.3:

CONTRACTOR will be required to comply with wage rates as follows:

County – Clay

State - Building

SC-6.10. Article 6., Construction Phase Services, shall be amended by adding the following Paragraph 6.10, Subparagraph G.1:

The Design-Builder, subcontractors (all tiers), and suppliers shall furnish sufficient forces, construction plant, and equipment, and shall work such hours as may be required to insure the prosecution of the Work in accordance with the time periods specified in the Contract Documents. If in the opinion of the City, the Design-Builder falls behind the Construction Progress Schedule, the Design-Builder shall take such steps as may be necessary to improve the progress. The City may require the Design-Builder to submit a recovery plan which may include an increase in the number of shifts, and/or overtime operations, and days of work including holidays, Saturdays, and Sundays, all without additional costs to the City.

SC-6.10.E Article 6, Construction Phase Services, shall be amended by adding the following Paragraphs:

6.10.E.1 It is anticipated that work under separate contracts will be performed at the Site, concurrent with the Work to be performed pursuant to these Contract Documents. The City will have authority and responsibility for coordination of the activities among these DESIGN-BUILDERs performing work at the Site.

Design-Builder and Design-Builder's employees shall confine their activities to the areas assigned except for the necessary Work connected with this Contract. In the event of conflicting interests not immediately resolved between two or more contractors, the decisions of the City will be final.

SC-6.12.A. Article 6, Construction Phase Services, shall be amended by adding the following Paragraph 6.12.A:

a. DESIGN- BUILDER shall submit 3 sets of required Warranty data bound into 11-1/2 inch by 11-1/2 inch 3 D-side ring expansion plastic binders.

a.1. Binder covers shall have printed title "WARRANTIES", Project identification, and subject matter on cover and exterior edge of binder.

a.2. DESIGN-BUILDER shall provide a table of contents for each volume, with each Product or piece of equipment identified, typed on 24 pound white paper.

a.3. DESIGN-BUILDER shall provide a directory with list names, addresses, and telephone numbers of Design-Build Team, Architect, Architect's consultants, contractor,, all tier subcontractors, and product and equipment supplier.

a.4. DESIGN-BUILDER shall arrange Warranties by system.

SC-8.02., Article 8, City's Services and Responsibilities, is deleted and replaced with the following paragraph:

8.02.A. Due to the unavailability of current survey information, the successful bidder is required to provide survey information for use in Design and Construction.

SC-11.01 Article 11, Paragraph 11.01, Time of the Essence is amended by adding the following new Subparagraphs immediately following Subparagraph 11.01 A:

B. Starting and Completion

1. The Work to be performed under this Contract shall begin on the date specified in the written Notice to Proceed issued by the Director of Water Services, and the Work shall be substantially complete, in accordance with Paragraph 1.05, on or before within five-hundred and forty (540) Calendar Days thereafter. Once the Work starts, DESIGN-BUILDER shall continuously pursue completion of the Work.

2. The Work shall be completed and ready for final payment in accordance with Paragraph 13.06 within sixty (60) Calendar Days after the date of Substantial Completion of the Work.

C. Liquidated Damages

1. If the Work is not substantially completed, in accordance with Paragraph13.05, on or before (date) ***[or]*** within the period stated in Paragraph 11.01 B.1], DESIGN-BUILDER shall pay liquidated damages to CITY in the amount of Two Thousand ($2,000.00) for each Calendar Day until the Work is substantially complete. The amount of liquidated damages shall be deducted from any payments due or to become due DESIGN-BUILDER.

2. If the Work is not completed and ready for final payment in accordance with Paragraph 13.05, within the period stated in Paragraph 11.01 B.2, DESIGN-BUILDER shall pay liquidated damages to CITY in the amount of Five Hundred ($ 500.00) for each Calendar Day until the Work is completed and ready for final payment. The amount of liquidated damages shall be deducted from any payments due or to become due DESIGN-BUILDER.

SC-13.01A: Article 13, Payment, is revised by adding the following Paragraphs to 13.01, Schedule of Values:

.1 Design-Builder will submit PDF of the Schedule of Values using City Form 01290.02.

.2 Include separate line items for (i) Bonds and (ii) Insurance.

.3 Dollar amounts shall include material, labor, overhead, and profit applicable to each individual item indicated.

.6 Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

SC- 13.02. Article 13, Payment, is revised by adding the following to Paragraphs as follows:

13.02.D. City shall make payments to Design-Builder monthly on or about the 15th day of each month. Payments to Design-Builder will be made on the basis of ninety-five percent (95%) of the value of the Work satisfactorily completed plus ninety-five percent (95%) of the value of properly stored and insured, unused materials on hand on the Site of the Work. City shall retain five percent (5%) of each partial payment until completion and acceptance of the Work covered by the Contract and final payment is due. All Work covered by a payment becomes City's property, provided that the Work paid for remains the sole responsibility of Design-Builder until all terms and conditions of the Contract have been met.

13.02.E. Design-Builder shall submit ***one (1)*** copies of the Application for Payment, in typewritten form, using City Form 01290.01 and accompanied by Schedule of Values, Form 01290.02, as well as any other supporting documents required by the Contract.

.1 Using the approved Schedule of Values, indicate dollar value in each column of each line item for portion of Work completed through the last day of the application period. Round off dollar values to the nearest dollar. Complete every entry on the form including the MBE/WBE dollar amounts and percentages.

.2 Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or bonded warehousing if required.

.3 Change Orders: Indicate each authorized Change Order as separate items on continuation sheet. List by Change Order Number and indicate dollar value breakdown of each Change Order.

.4 Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.

13.02.F In addition to the requirements of Paragraph 13.02.E, Design-Builder shall submit the following with each Application for Payment.

.1 Updated Construction Progress Schedule.

.2 Construction Progress Photos JPG files

SC-13.05 Article 13, Payment, Paragraph 13.05., Substantial Completion, Subparagraph B is supplemented as follows:

13.05.B.1 To be considered substantially complete, the following items of the Work must be operational and ready for City's continuous use as intended:

(i) All elements of the Work are complete and operational, ready for Owner's continuous occupancy and use as intended.

- Required inspections of existing House Service Main not being replaced
- Major segments of House Service Main Pipe installed
- Pipe Rack Assemblies
- In-line Process Valves
- Hydrants and/or standpipes

(ii) A list of deficiencies has been completed by the Contractor and accepted by the Program Manager.

(v) All life safety systems, including but not limited to fire protection, are fully operational and tested.

(vi) All hydrants and/or standpipes have been flow tested for full operation.

(vi) The Owner has been instructed in the use and operation of systems serving the space.

Items of the Work not essential to City's operation, which may be completed without after the Work is accepted as Substantially Complete, and may include the following: minor damage to finishes, including.

Items of the Work not essential to plant operation, which may be completed without interruption of plant operation, may be completed after the Work is accepted as substantially complete, and may include the following:

(i) Minor adjustment of hardware,

(iii) Similar minor adjustments or replacements

City shall also allow Design-Builder reasonable access to complete items listed in Paragraph 13.05 A which may be completed after the Work is accepted.

SC-13.06 Article 13, Payment, Paragraph 13.06 – Final completion; Final Payment is revised by adding the following to Paragraphs as follows:

13.06.B Final Payment Application: In addition to other Application for Payment requirements, the Final Payment Application must be accompanied by Form 01290.14 Contractor Affidavit for Final Payment and Form 01290.15 Subcontractor Affidavit for Final Payment for each subcontractor regardless of tier.

SC-14.02 E Article 14, Paragraph 14.02, CITY May Terminate for Default, is amended y adding the following new subparagraph E.

14.02 E – If CITY must complete the Work, all costs and charges incurred by CITY, together with the cost of completing the Work under the Contract, will be deducted from any monies due or which may become due DESIGN-BUILDER. If such expense exceeds the sum which would have been payable under the Contract, then DESIGN-BUILDER and the surety shall be liable and shall pay to CITY the amount of such access.

ATTACHMENT E: Project Technical Requirements

SECTION 02821 – FENCES AND GATES

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers chain-link fences and gates.

B. Design-Builder shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:
   1. Section 03000– Concrete

1.03 REFERENCES

A. American Society of Testing and Materials (ASTM)
   1. A90 – Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings
   2. A121 – Standard Specification for Metallic-Coated Carbon Steel Barbed Wire
   3. A153 – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
   4. A392 – Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric
   5. A653 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
   6. F626 – Specification for Fence Fittings
   7. F668 – Specification for Poly (Vinyl Chloride) (PVC)-Coated Steel Chain-Link Fence Fabric
   8. F900 – Specification for Industrial and Commercial Swing Gates
   9. F934 – Specification for Standard Colors for Polymer-Coated Chain Link Fence Materials
   10. F1043 – Standard Specification for Strength and Protective Coatings on Steel Industrial Fence Framework
   11. F1083 – Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures
   12. F1184 – Specification for Industrial and Commercial Horizontal Slide Gates

1.04 DEFINITIONS

A. OD – Outside Diameter of Pipe

1.05 SUBMITTALS

A. Submit as specified in Section 01019 – Closeout Procedures.

B. Submit manufacturer's literature describing components to be provided, giving manufacturer's name, product component name, and line number for each component.

C. Technical Submittals Include, but not limited to the following:
   1. Catalog data
   2. General Arrangements

TEMPLATE

3. Assembly and disassembly or repair instructions
4. Fabrication Drawings
5. Detail Drawings
6. Schematic and Wiring Diagrams
7. Installation Drawings
8. Mounting Assembly Diagram
9. Performance Data
10. Instruction books and Operation and Maintenance manuals
11. Spare parts lists

D. Quality Assurance Submittals
   1. Provide manufacturer's certification that products to be used comply with specified requirements and are suitable for intended application.

1.06 QUALITY ASSURANCE

A. Qualifications
   1. Equipment specified herein shall be the product of a reputable and qualified manufacturer who is of proven ability and has at least five (5) years of experience in the production of such equipment in sizes similar to those required on this project. The manufacturer shall have completed and made ready for operation at least twenty-five separate installations in the United States that have been in operation for at least five (5) years.
B. Sourcing – If more than one (1) window is procured via this section, window shall be provided from a single manufacturer.
C. Identification – Products must include a nameplate securely mounted to the equipment and for the motor/driver. At a minimum the nameplate must include the following.
   1. Manufacturer's name, product name, and number
   2. Manufacturer's Contract/Order Number
   3. Weight of Bundle
   4. Customer Name and Job Name
   5. Product Description Gage, Product Name, and Finish
   6. Number of Pieces, Lengths
   7. Delivery Area
   8. Bundle Number
   9. Special Storage Instructions
D. Pre-construction Conference
   1. Before any construction Work of commences of the roof, roof assemblies, and roof components, a pre-construction conference must be held and attended by City's Representative, Engineer, and Manufacturer's Technical Representative.
   2. At a minimum, the following topics shall be addressed and discussed during the pre-production conference.
      a. Contract Documents
      b. Project Safety Plan
      c. Schedule of technical submittals
      d. Quality Control
      e. Delivery, Storage, and Handling
      f. Field Representative Services
E. Manufacturer's Service

TEMPLATE

1. The Manufacturer's Technical Representative shall be available to provide on-site technical assistance during commissioning activities.

1.07 DELIVERY, STORAGE, AND HANDLING

A. All components and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment tools, and methods used in unloading, reloading, hauling, and shipping shall be such that components are not damaged.
B. For equipment exceeding 50 pounds, lifting eyes and lifting lugs shall be provided to allow for installation.
C. Boxes and packages shall be properly marked to show its net and total weight, contents within the box and/or package.
D. Items shall be marked as identified in delivery schedule and as shown in Submittals and include a complete list and bills of materials with each shipment. Each item requiring assembly shall be properly tagged and marked.
E. If items are shipped separately, they shall be tagged and indicated as such to facilitate proper assembly on-site.

1.08 WARRANTY

A. Equipment manufacturer shall provide a warranty for all items furnished in accordance with Section 01740. Warranty shall run concurrently with the Contractor's warranty and commence at final completion and CITY's acceptance.
B. Warranty shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate equipment design, improper assembly or erection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the manufacturer.

PART 2 – PRODUCTS

2.01 DESIGN

A. Type – Fences and Gates shall be of the chain-linked type.
B. Features
   1. Terminal Posts shall be braced and trussed.
   2. All terminal posts and line posts shall be supported by concrete footings.
   3. In high visibility areas, twisted strand fence fabric may be sufficient in lieu of the use of barbed wire.
   4. All steel components shall be the color ASTM F934 - Black.
C. Site conditions
   1. Fences and Gates shall meet all design load requirements as specified by Section 01810 – Project Design Criteria
D. Operating Conditions
   1. Total Height: 9 ft
      a. Height of Fabric: 8 ft.
      b. Height of Barbed Wire: 12 in. (Qty. 3 strands above Fence Fabric)
   2. Distance between posts: 10 ft. on center

2.02 COMPONENTS

A. Chain-Link Fence Fabric
   1. Mesh: 1" x 8 gage (9 gage core)

TEMPLATE

2. Selvage:
    a. Top Edge: Twist
    b. Bottom Edge: Twist
3. Fabric Installation Location:
    a. Security Side of Posts
    b. Posts - Attached 15 in. on center with wire ties
    c. Rails/Braces/Tension Wires – Attached 24 in. on center with wire ties
4. Color: ASTM F934 – Black

B. Industrial Fence Framing
1. Railing
    a. Top Rail: 1-5/8” OD ASTM F1043 Group 1C
    b. Middle Rail: 1-5/8” OD ASTM F1043 Group 1C
2. Posts
    a. Terminal Post: 2-7/8 in. OD ASTM F1043 Group 1C
    b. Line Post: 2-3/8 in. OD ASTM F1043 Group 1C
    c. Gate Post: 4 in. OD ASTM F1043 Group 1C
3. Fittings:
    a. Rail Cap: 1-5/8” OD ASTM F1043 Group 1C
    b. Tie Wires: 9 Gauge
    c. Tension Wire: 7 Gauge
4. Truss Rod: Steel Mechanical
    a. Thickness: 9 Gauge
    b. Orientation: Diagonal
5. Tension Wire
    a. ASTM A392 7 Gauge Galvanized Class 2
6. Color: ASTM F934 - Black

C. Industrial Swing Gates
1. Type: ASTM F900 - Double Swing
2. Width: 24 ft.
3. Fabric: (Match Chain Link Fence Fabric)
4. Barbed Wire: (Match Barbed Wire on Fence)
5. Double swing gate 2” ss-40 black coated pipe frame with match 1” mesh, barb wire and commercial grade swing gate hardware
6. Color: ASTM F934 - Black

D. Industrial Horizontal-Slide Gates
1. Type: ASTM F1184 - Cantilever
2. Width: 20 ft.
3. Fabric: (Match Chain Link Fence Fabric)
4. Barbed Wire: (Match Barbed Wire on Fence)
5. Materials:
    a. Roller: Nylon
6. Galvanized Steel
7. Color: ASTM F934 - Black

E. Barbed Wire
1. 12-1/2 Gauge 4-point Class 3
2. Color: ASTM F934 - Black

TEMPLATE

F. Footings
    a. Refer to Section 03000 - Concrete

2.03 APPROVED VENDORS
A. Broski Fence
B. Or Equal

PART 3 – EXECUTION (NOT USED)

END OF SECTION

TEMPLATE

SECTION 03000 – CONCRETE

PART 1 – GENERAL

1.1 SUMMARY

A. This section covers concrete used throughout wastewater facilities.

B. Contractor shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.2 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:
   1. Section 03100 – Concrete Forms & Accessories
   2. Section 03153 – Waterstops
   3. Section 03200 – Concrete Reinforcement
   4. Section 03600 – Grouting
   5. Section 03630 – Epoxies
   6. Section 03900 – Concrete Restoration & Cleaning

1.3 REFERENCES

A. American Concrete Institute (ACI)
   1. 211.1 – Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete
   2. 232.2R – Use of Fly Ash in Concrete
   3. 304 – Recommended Practice for Measuring, Mixing, Transporting and Placing concrete
   4. 304R – Guide for Measuring, Mixing, Transporting, and Placing Concrete
   5. 304.2R – Placing Concrete by Pumping Methods
   6. 305 – Committee Report on Hot-Weather Concreting
   7. 305R – Hot Weather Concreting
   8. 306 – Committee Report on Cold-Weather Concreting
   9. 306R – Cold Weather Concreting
   10. 309 – Recommended Practice for Consolidation of Concrete
   11. 318 – Building Code Requirements for Reinforced Concrete
   12. 347 – Recommended Practice for Concrete Formwork
   13. 350 – Code Requirements for Environmental Engineering Concrete Structures and Commentary

B. American Society of Testing and Materials (ASTM)
   1. A615 – Deformed and Plain Billet Steel Bars for Concrete Reinforcement
   2. C31 – Test Methods of Making and Curing Concrete Test Specimens in the field.

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3. C33 – Concrete Aggregates
4. C39 – Test Method for Compressive Strength of Cylindrical Concrete Specimens
5. C42 – Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
6. C94 – Ready-Mixed Concrete
7. C143 – Slump of Portland Cement Concrete
8. C150 – Portland Cement
9. C156 – Standard Test Method for Water Retention by Liquid Membrane-Forming Curing Compound for Concrete
10. C171 – Standard Specification for Sheet Materials for Curing Concrete
11. C173 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
12. C192 – Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
13. C231 – Standard Test Method for Air Content of Freshly Mixed concrete by the Pressure Method
14. C260 – Standard Specification for Air-Entraining Admixtures for Concrete
15. C309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
16. C494 –Standard Specification for Chemical Admixtures for Concrete
17. C1017 – Standard Specification for Chemical Admixures for use in Producing Flowing Concrete
18. C1077 – Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
19. C1218 – Standard Test Method for Water-Soluble Chloride in Mortar and Concrete
20. C1260 – Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
21. D4783 – Standard Test Methods for Resistance of Adhesive Preparations Container to Attack by Bacteria, Yeast, and Fungi
22. E329 – Standard Specification for Agencies Engaged in Construction Inspection and/or Testing

C. International Code Council (ICC)
   1. International Building Code (IBC) 2018 with City of Kansas City, MO Amendments
D. National Ready Mixed Concrete Association (NRMCA)
   1. Quality Control Manual, Section 3 – Certification of Ready Mixed Concrete Production Facilities
E. Truck Mixer Manufacturers Bureau (TMMB)
   1. TMMB 100 – Truck Mixer, Agitator and Front Discharge Concrete Carrier Standards

1.4 DEFINITIONS

A. Cold weather – period when for more than 3 successive days the mean daily temperature drops below 40°F.
B. F_C' – Minimum compressive strength of concrete

TEMPLATE

C. Lightweight aggregates – Aggregates with the intended use in concrete masonry units.
D. Normal-weight aggregate – Aggregates for use in concrete
E. O.D. – Outside Diameter
F. Severe Exposure – As defined by ACI 211, Concrete which is exposed to deicing chemicals or other aggressive agents or where the concrete may become highly saturated by continual contact with moisture or free water prior to freezing.
G. Vented Heaters – Heaters which exhaust flue gases directly to atmosphere and do not enter the heated space.
H. Water-reducing admixture – may also be referred to as "Plasticizer"

1.5 SUBMITTALS

A. Submit as specified in Section 01019 – Closeout Procedures.

B. Submit manufacturer's literature describing components to be provided, giving manufacturer's name, product component name, and line number for each component.

C. Technical Submittals Include, but not limited to the following:
   1. Catalog data
   2. General Arrangements
   3. Assembly and disassembly or repair instructions
   4. Fabrication Drawings
   5. Detail Drawings
   6. Installation Drawings
   7. Performance Data
   8. Installation Manual

D. Quality Assurance Submittals
   1. Provide manufacturer's certification that products to be used comply with specified requirements and are suitable for intended application.

1.6 QUALITY ASSURANCE

A. Qualifications
   1. Materials specified herein shall be the product of a reputable and qualified manufacturer who is of proven ability and has at least five (5) years of experience in the production of such equipment in sizes similar to those required on this project.
   2. Installer shall be an authorized representative trained and approved.

1.7 DELIVERY, STORAGE, AND HANDLING

A. All components and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment tools, and methods used in unloading, reloading, hauling, and shipping shall be such that components are not damaged.
B. For materials exceeding 50 pounds, lifting eyes and lifting lugs shall be provided to allow for installation.

TEMPLATE

C. Boxes and packages shall be properly marked to show its net and total weight, contents within the box and/or package.
D. Items shall be marked as identified in delivery schedule and as shown in Submittals and include a complete list and bills of materials with each shipment. Each item requiring assembly shall be properly tagged and marked.
E. If items are shipped separately, they shall be tagged and indicated as such to facilitate proper assembly on-site.

1.8 WARRANTY

A. Installer shall provide a warranty for all items furnished and installed in accordance with Section 01740. Warranty shall run concurrently with the Contractor's warranty and commence at final completion and CITY's acceptance.
B. Warranty shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate material selection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the installer.

PART 2– PRODUCTS

2.1 GENERAL

A. All concrete shall be considered subject to the following conditions
   1. Exposed to freezing temperatures while wet
   2. Suitable for building construction per the International Building Code
   3. Watertight
   4. Made with normal weight aggregate
B. Concrete Design
   1. Water-Bearing Structures
      a. Designed per ACI 350 – Environmental Engineering Concrete Structures.
      b. Cement Type: ASTM C150 Type V
      c. Maximum Water-Cementitious Ratio, by Weight: 0.40
      d. F_C': 5000 psi @ 28 days
      e. Minimum Cementitious Material:
         (i) In instances when there are varied sizes of coarse aggregate, the appropriate amount of cementitious materials shall be determined by

Nominal Maximum Aggregate Size.	Coarse Aggregate (ASTM C33)	Minimum Cementitious Materials
inches	Size No.	lb/cu. yd.
1/2"	7	580
3/8"	8	600
1/2"	7	580
3/4"	67	560
1"	57	535
1-1/2"	467	515

TEMPLATE

f. Maximum Air Content:

Nominal maximum aggregate size, In.	Air Content
inches	%
3/8"	7.5
1/2"	7
3/4"	6
1"	6
1-1/2"	5.5
2"	5
3"	4.5

2. Open flow channels
   a. Designed per ACI 350 – Environmental Engineering Concrete Structures.
   b. Cement Type: ASTM C150 Type V
   c. Maximum Water-Cementitious Ratio, by Weight: 0.40
   d. F_C': 5000 psi @ 28 days
   e. Minimum Cementitious Material: 610 lb /cu. yd.
   f. Maximum Air Content: 6%
3. Fence Footings
   a. Post Dimensions: 16 in. wide by 42 in. deep
   b. Cement Type: ASTM C150 Type II or Type III
   c. Fc': 3000 psi
   d. Aggregate: ASTM C33 Size 57
   e. Expected life of Concrete: 50 years (No Alkali Aggregate reactions or other modes of failure)

2.2 MATERIALS

A. Cement Composition

1. Portland cement is composed of tricalcium silicate, dicalcium silicate, tricalcium aluminate, and tetra-calcium aluminoferrite. Additional cementitious materials such as Fly ash, slag, or silica fume may be used dependent as the maximum percentages are not exceeded within the overall chemical composition.

Substitute Cementitious Materials	Maximum Amount
ASTM C618 - Fly ash or other Pozzolans	25%
ASTM C989 - Slag	50%
ASTM C1240 - Silica fume	10%
Total of fly ash or other Pozzolans, slag, and silica fume	50%
Total of fly ash or other Pozzolans and silica fume	35%

TEMPLATE

B. Coarse Aggregate
   1. Maximum Size:
      a. Not to exceed any of the following conditions.
         (i) 1/5 the narrowest dimension between sides of form
         (ii) 1/3 the depth of the slab
         (iii)¾" the minimum clear spacing between individual reinforcing bars or wires, bundles of bars, tendons, or ducts.

C. Fine Aggregates
   1. Fine aggregates shall be composed of natural sand, manufactured sand, or a combination thereof.
   2. Sieve Requirements

Sieve	% Passing
3/8"	100
No. 4	95-100
No. 8	80-100
No. 16	50-85
No. 30	25-60
No. 50	5-30
No. 100	0-10

D. Admixtures
   1. ASTM C494 Type E, Water Reducing and Accelerating
   2. Admixtures containing Calcium Chloride shall not be used.
E. Water
   1. Type: Potable Water
   2. Maximum Chloride Ions:
      a. Pre-stressed Concrete: 0.06 % by weight of cement
      b. Reinforced Concrete: 0.10% by weight of cement

PART 3– EXECUTION

3.1 TEMPERATURE REGULATION
A. Hot-Weather Concreting
   1. Prior to batching, manufacturer may perform following activities to maintain lower concrete temperatures, but not limited to:
      a. Aggregate temperature reduction
         (i) Spraying aggregate
         (ii) Storing aggregates in spaces not exposed to direct sunlight
         (iii)Removal of top layer aggregate for use of non-exposed aggregate in the batch
         (iv)Or Equal.

TEMPLATE

b. Water temperature regulation
(i) Use of water with temperature lower than ambient
(ii) Use of water with crushed, shaved, or chipped ice

B. Cold-Weather Concreting
1. Prior to batching, manufacturer may perform following activities to maintain lower concrete temperatures, but not limited to:
a. Aggregate temperature increase
(i) Sand may be heated
(ii) Radiant pipes/heaters running through coarse aggregate
(iii) Or Equal
b. Water temperature regulation
(i) Water may be used
(ii) Steam may be used when aggregates are below freezing temperatures (<32°F) as long as moisture content equilibrium is maintained

3.2 MIXING AND TRANSPORTATION
A. At CITY's request, CITY's representative(s) shall be allowed to witness mixing operations if mixed prior to arrival on site.
B. Batches shall be made at the limited temperature (not ambient temperature)
C. There are no limits on revolutions of revolving-drum trucks as long as the following conditions are met.
1. Specified Mixing water is not exceeded
2. No retempering water is added
3. Concrete has satisfactory plastic physical properties
4. Satisfactory consistency and homogeneity for satisfactory placement and consolidation
D. After trucks have delivered concrete to Site, proper concrete washout practices shall be performed before leaving the Site.

3.3 FORMWORK
A. For formwork installation prior to pouring of any concrete mixes, refer to Section 03100 – Concrete Forms and Accessories
B. For installation of integral waterstops, refer to Section 03153 – Waterstops.

3.4 REINFORCEMENT
A. For reinforcement requirements, refer to Section 03200 – Concrete Reinforcement.

3.5 SLUMP TESTING
A. Shall be performed in accordance with ASTM C143.
B. Concrete testing shall be performed at 3 day, 7 day, and 28 day periods.
C. Concrete mixes may be slump tested at the central plant tested prior to transportation. Slump testing shall be performed for each batch at the construction site regardless of whether it has been slump tested at the central plant.

TEMPLATE

D. All concrete deliveries shall be slump tested at the construction site before pouring into Concrete formwork.
E. Slump tests at the construction site shall be performed in the presence of the Resident Project Representative (RPR).
F. The allowable slumps are as listed below and as indicated in ACI 211.1.

	Slump	
Types of Construction	Maximum (In.)	Minimum (In.)
Reinforced foundation walls and footings	3	1
Plain footings, caissons, and substructure walls	3	1
Beams and reinforced walls	4	1
Building columns	4	1
Pavements and slabs	3	1
Mass Concrete	2	1

3.6 INSTALLATION

A. Pouring
   1. Concrete shall be dumped into the face of concrete-in-place. Concrete shall not be dumped away from Concrete-in-place.
   2. Concrete poured onto sloped surfaces shall start at the bottom-end of the slope.
   3. In the event separation has not been eliminated in filling placing buckets, turn the bucket such that rocks fall on fresh concrete such that it may be readily worked into mass. Separated rocks shall not be dumped in a manner that free rock rolls out on forms or subgrade.
   4. Drop Pipes
      a. The top end of drop pipes shall be a minimum of 6x-8x the maximum aggregate size.

B. Field Control
   1. At Engineer or Resident Project Representatives request, a core sample may be taken of any questionable areas or volumes. In areas deemed to be deficient per this Specification, the cost to repair shall be at Contractor's expense.

C. Hot-Weather Concreting
   1. Perform in accordance with ACI 305-R – Hot-Weather Concreting.
   2. In conditions with excessive high temperatures, low humidity, high wind speeds, concrete surface shall be wetted by fog spray or other means) to prevent crusting of surfaces. For additional means of mitigating evaporation rates greater than 0.2 lb/sq.ft/hr, refer to Section 03100 – Concrete Forms and Accessories
   3. Under no conditions, shall water be added to mixtures after concrete slump testing and cylinders are tested for compressive strength.

D. Cold-Weather Concreting
   1. Perform in accordance with ACI 305-R – Hot-Weather Concreting.

TEMPLATE

2. If concrete is to be poured during cold-weather, the subgrade may be covered with frost blankets or other means of heating may be applied to mitigate freezing of subgrade before the pour.
    a. Frost blanket shall be removed prior to pouring of concrete.
3. Vented heaters may be used.
4. The use of salamander heaters or other heating devices that could expose fresh concrete to polluted atmospheres, exhaust flue gases, or carbon dioxide is not permitted.
5. For additional insulation formwork, refer to Section 03100 – Concrete Forms and Accessories.

3.7 STRENGTH TESTING

A. Samples shall be from each batch delivered to Site.
B. The average strength, the difference of values shall not be greater than the Standard deviation identified per ACI 350.
C. A total of six (6) cylinders shall be taken from each batch for strength testing and in laboratory conditions. Laboratory-cured specimens shall be in accordance with ASTM C39.
    1. Two (2) cylinders shall be strength tested at 3-days.
    2. Two (2) cylinders shall be strength tested at 7-days.
    3. Two (2) cylinders shall be strength tested at 28-days.
D. A total of six (6) cylinders shall be taken from each batch for strength testing and in field-cured conditions. Specimens field cured shall be in accordance with ASTM C31.
    1. Two (2) cylinders shall be strength tested at 3-days.
    2. Two (2) cylinders shall be strength tested at 7-days.
    3. Two (2) cylinders shall be strength tested at 28-days.
E. If field-cured concrete specimens are less than 85% of the strength of laboratory-cured concrete specimens, immediate action shall be taken to improve procedures for field curing of concrete.

3.8 COMMISSIONING

A. After concrete has been allowed to fully cured, Contractor shall schedule an inspection with City, City's representative, and City's inspector.
B. Concrete shall be free of voids, honeycombs, cracks, and finished surfaces shall not be chipped, cracked, or found to be deficient.
C. Any deficiencies in concrete shall be repaired and restored per Section 03900 – Concrete Restoration and Cleaning prior to continuing Work.
D. Embedded pipes may be filled after passing inspection.

END OF SECTION

TEMPLATE

SECTION 03100 – CONCRETE FORMS AND ACCESSORIES

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers concrete used throughout wastewater facilities.

B. Design-Builder shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:
   1. Section 03100 – Concrete Forms & Accessories
   2. Section 03153 – Waterstops
   3. Section 03200 – Concrete Reinforcement
   4. Section 03600 – Grouting
   5. Section 03630 – Epoxies
   6. Section 03900 – Concrete Restoration & Cleaning
   7. Section 15200.150DI – Ductile Iron Pipe & Fittings.

1.03 REFERENCES

A. American Concrete Institute (ACI)
   1. SP. Number 4 – Formwork for Concrete
   2. 318 – Building Code Requirements for Reinforced Concrete
   3. 347 – Recommended Practice for Concrete Formwork
   4. 350 – Code Requirements for Environmental Engineering Concrete Structures and Commentary

B. American Society of Testing and Materials (ASTM)

C. International Code Council (ICC)
   1. International Building Code (IBC) 2018 with City of Kansas City, MO Amendments

1.04 DEFINITIONS

A. Shores – Vertical or inclined support members designed to carry the weight of formwork, concrete, and construction loads above concrete.

B. Reshores – Shores placed firmly under stripped concrete slab or structural member where original formwork has been removed, and requires the new slab or structural member to support is own weight and construction loads posted to it.

C. Tolerances – The largest deviation minus the smallest deviation from the nominal value over a given length (in ft.) unless otherwise specified.

TEMPLATE

D. Permanent Shores – Original shores that remain in place without being disturbed during and after formwork removal, and without permitting new concrete to support its own weight and additional construction loads above.

1.05 SUBMITTALS

A. Submit as specified in Section 01019 – Closeout Procedures.
B. Submit manufacturer's literature describing components to be provided, giving manufacturer's name, product component name, and line number for each component.
C. Technical Submittals Include, but not limited to the following:
    1. Catalog data
    2. General Arrangements
    3. Assembly and disassembly or repair instructions
    4. Fabrication Drawings
    5. Detail Drawings
    6. Installation Drawings
    7. Mounting Assembly Diagram
    8. Installation Manuals
D. Quality Assurance Submittals
    1. Provide manufacturer's certification that products to be used comply with specified requirements and are suitable for intended application.

1.06 QUALITY ASSURANCE

A. Qualifications
    1. Materials specified herein shall be the product of a reputable and qualified manufacturer who is of proven ability and has at least five (5) years of experience in the production of such equipment in sizes similar to those required on this project.
    2. Installer shall be an authorized representative trained and approved.

1.07 DELIVERY, STORAGE, AND HANDLING

A. All components and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment tools, and methods used in unloading, reloading, hauling, and shipping shall be such that components are not damaged.
B. For materials exceeding 50 pounds, lifting eyes and lifting lugs shall be provided to allow for installation.
C. Boxes and packages shall be properly marked to show its net and total weight, contents within the box and/or package.
D. Items shall be marked as identified in delivery schedule and as shown in Submittals and include a complete list and bills of materials with each shipment. Each item requiring assembly shall be properly tagged and marked.
E. If items are shipped separately, they shall be tagged and indicated as such to facilitate proper assembly on-site.

1.08 WARRANTY

TEMPLATE

A. Installer shall provide a warranty for all items furnished and installed in accordance with Section 01740. Warranty shall run concurrently with the Contractor's warranty and commence at final completion and CITY's acceptance.
B. Warranty shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate material selection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the installer.

PART 2– PRODUCTS

2.01 GENERAL

A. Design
1. Formwork Tolerances
a. Tolerances listed herein include is for the final cured concrete structure (including any deformations of formwork during concrete pours.
(i) Environmental Engineering Structure (i.e. basins, clarifiers, wet wells, dry wells,etc.)
1. Form – Size Dimensions

Form Cross-Sectional Variations	+ 1/2 in. - 1/4 in.
Form - Thickness Variations	+ 1/2 in. - 1/4 in.
Form - Footing Variations	+ 1/2 in. - 1/4 in.

2. Form - Location & Orientation Dimensions

		Tolerance over given length			
		10 ft.	20 ft.	30 ft.	40 ft.
Northing-Easting Coordinates			1/2 in.		3/4 in.
	Abovegrade	1/2 in.	3/4 in.		1 1/4 in.
Plumb variation	Buried	1 in.	1-1/2 in.		2-1/2 in.
	Abovegrade	1/4 in.		1/2 in.	
Level variation	Buried	1/2 in.		1 in.	

2. Permanent Forms
a. Permanent Forms may be use in the installation of clarifiers. The design of such structures shall include weep holes, or ports at the opposite end of the pour to confirm the form is free of voids.
3. Void Forms

TEMPLATE

a. Void forms are prohibited in the use of formwork. Prior to concrete installation, the site shall be dewatered to remove any potential groundwater within expansive soils.

4. Construction Joints
   a. Construction joints shall be placed such that form can be poured within one (1) working day.
   b. Construction joints may also be the location of expansion/contraction joints in the final concrete structure
5. Through pipes and conduits
   a. Formwork for thrust blocks, restraint blocks, or other concrete blocks used for underground piping shall apply concrete cover both to reinforcement bars and pipe. Refer to Section 03200 – Concrete Reinforcement.
   b. Integral waterstops shall be utilized for all water-bearing concrete structures.
6. Embedded pipes and conduits
   a. The following is spacing requirements for embedded pipes and conduits that are embedded in concrete (not only passing through concrete).

Concrete Slab Thickness	Maximum Conduit / Pipe Size	3x Spacing
4"	3/4" NPS	2.52 in
8"	2" NPS	7.125 in
12"	3" NPS	10.5 in
16"	4" NPS	13.5 in
20"	6" NPS	19.875 in
24"	6" NPS	19.875 in
30"	8" NPS	25.875 in
36"	10" NPS	32.25 in

   b. In the event, two conduits/pipes of different sizes run adjacent or over/under one another, then the spacing applied shall be the larger of the two conduits/pipes.
   c. Routing of embedded pipes and conduits within horizontal slabs shall be between the top and bottom reinforcing bars.
   d. No more than 4% of the cross-sectional area of any column shall be displaced by embedded pipes and conduits.
7. Formwork Accessoreis
   a. The safety factor of all accessories shall be 2.0.
      (i) If the form is to support the weight of the forms, concrete, construction live loads, and impact, then the safety factor shall be 3.0.

2.02 MATERIALS

A. Formwork

TEMPLATE

1. Steel/Aluminum forms shall be utilized unless otherwise specified. The rated capacity of formwork shall meet the lateral pressure and vertical pressure of concrete pouring activities.
2. Steel formwork for clarifier walls may be permanent forms contingent upon the following items.
    a. Steel sheathing is smooth and free of burrs or other items that would otherwise detract from the function of the clarifier.
    b. Steel is the same material as specified by Clarifier manufacturer.
3. Wood sheathing shall not be used on any surface of any concrete structure servicing process fluids (influent, effluent, sludge, etc.)

B. Falsework
1. Supports for concrete forms shall meet the rated capacities as specified by Engineer.
2. Footings shall be of concrete material. For concrete requirements, refer to Section 03000 – Concrete.

C. Embedded Pipes and Conduits
1. 2” and Less: Carbon Steel, Schedule 40, Socket Welded Ends
2. 3” and Greater: Carbon Steel, Schedule 40, Beveled Ends
    a. Pipe and Conduits 3” NPS and greater shall not be considered as replacing structurally.

D. Accessories
1. Form ties, anchors, hangers, and side form spacers: ASTM A580 316SS.

E. Joint Sealants
1. Refer to Section 07920 – Joint Sealants

F. Waterstops
1. Refer to Section 03153 – Waterstops.

G. Insulation
1. Only to be used for cold-weather concreting.
2. Minimum R Value: 4

H. Form Release Agent
1. Type: Chemically Active Form release agent
2. Certification
    a. NSF 61 certified
3. Additional Applicable Standards:
    a. CEGS Section 03300 – Paragraph 10.8

PART 3– EXECUTION

3.01 PREPARATION

A. Formwork design – Contractor shall submit formwork implementation plan that includes the installation and removal of shores and reshores.
1. Contractor shall maintain a record of all formwork calculations, materials used, rated capacities of formwork.

TEMPLATE

B. Underground structures shall first be excavated accordingly with excavations adhering OSHA requirements. (i.e. sloping of excavations, points of egress, soil stabilization as needed, etc.)

3.02 FORMWORK INSTALLATION

A. All dimensions including on-centers, sizing, location, and orientations shall be verified prior to installation of reinforcement, form accessories, waterstops and insulation.
B. Apply form release agents to sheathing as applicable.
C. Reinforcement
    1. Form release agents must not come into contact with reinforcement. If in the event, form release agent has come into contact with reinforcement, reinforcement, must be washed, cleaned immediately prior to pouring concrete.
    2. All form ties, form anchors, form hangers, side form spacers, and waterstops shall be installed after reinforcement bars have been placed in formwork.
    3. Pipes, conduits, and sleeves shall be installed after reinforcement and ties, anchors, and waterstops has been placed within formwork.
        a. Piping through an environmental engineering concrete structure shall be Ductile Iron Material. Refer to Section 15200.150DI – Ductile Iron Pipe & Fittings.
        b. Aluminum pipe and Aluminum conduit is not permitted.
D. POURING
    1. Prior to any pouring of concrete, Formwork shall be checked to be sufficiently tight to prevent leakage of mortar.
    2. If installer is above 3.5 feet above grade due to the form height, fall protection and walkways will be provided as applicable by Contractor.
    3. Refer to Section 03000 – Concrete for additional requirements.
E. CONSTRUCTION LOADS
    1. Construction loads shall not be added to the concrete structure until all formwork has been removed.
    2. Construction loads shall not be added to concrete structure unless the Engineer indicates:
        a. The structure can support dead loads, live loads, and construction loads.
        b. Concrete Structure has reached sufficient strength to accommodate construction loads. Refer to strength testing requirements in Section 03000 – Concrete.
F. STRIPPING
    1. Forms may be removed when slabs and structural member may support dead loads, live loads, and construction loads.
    2. Any concrete surfaces found to be in need in repair after stripping of formwork shall be repaired promptly. Refer to Section 03900 – Concrete Restoration and Cleaning.
    3. If sheathing is to be re-used multiple times throughout project, form must be cleaned with water or compressed air after each use. Form release agent must be re-applied to sheathing before reuse unless manufacturer's instructions indicate otherwise.

3.03 COMMISSIONING

A. Refer to Section 03000 – Concrete

TEMPLATE

END OF SECTION

TEMPLATE

SECTION 03200 – CONCRETE REINFORCEMENTS

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers concrete reinforcement used throughout concrete structures used throughout wastewater facilities.

B. Contractor shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:
   1. Section 03000 – Concrete
   2. Section 03100 – Concrete Forms & Accessories
   3. Section 03153 – Waterstops
   4. Section 09960 – Steel Coatings

1.03 REFERENCES

A. American Concrete Institute (ACI)
   1. 304 – Recommended Practice for Measuring, Mixing, Transporting and Placing concrete
   2. 304R – Guide for Measuring, Mixing, Transporting, and Placing Concrete
   3. 309 – Recommended Practice for Consolidation of Concrete
   4. 315 – Manual of Standard Practice for Detailing Reinforced Concrete Structures
   5. 318 – Building Code Requirements for Reinforced Concrete
   6. 350 – Code Requirements for Environmental Engineering Concrete Structures and Commentary
   7. 439.2R – Steel Reinforcement Properties and Availability

B. American Society of Testing and Materials (ASTM)
   1. A82 – Cold-Drawn Steel Wire for Concrete Reinforcement
   2. A184 – Fabricated Deformed Steel Bar Mats for Concrete Reinforcements
   3. A185 – Welded Steel Wire Fabric for Concrete Reinforcement
   4. A421 - Uncoated Stress-Relieved wire for prestressed Concrete
   5. A416 – Uncoated Seven-Wire Stress-Relieved Strand for Prestressed Concrete
   6. A497 – Welded Deformed Steel Wire Fabric for Concrete Reinforcement
   7. A615 – Deformed and Plain Billet Steel Bars for Concrete Reinforcement
   8. A704 – Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
   9. A706 – Low-Alloy Stel Deformed Bars for Concrete Reinforcement
   10. A722 – Uncoated High-Strength Steel Bar for Prestressing Concrete

TEMPLATE

11. A934 – Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
12. A996 – Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement
13. A1065 – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
14. D3963 – Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing bars
15. E329 – Standard Specification for Agencies Engaged in Construction Inspection and/or Testing

C. American Welding Society (AWS)
   1. D1.4 – Structural Welding Code – Reinforcing Steel

D. Concrete Reinforcing Steel Institute (CRSI)
   1. Manual of Standard Practice

E. International Code Council (ICC)
   1. International Building Code (IBC) 2018 with City of Kansas City, MO Amendments

F. Society for Protective Coatings (SSPC)
   1. SP-10 – Near-White Metal Blast Cleaning

1.04 DEFINITIONS

A. Bundled Bars – group of parallel bars bundled in contact to act as a unit.
B. Rebar – Reinforcement Bar
C. #X – Size of Bar to be indicated by the Engineer.

1.05 SUBMITTALS

A. Submit as specified in Section 01019 – Closeout Procedures.

B. Submit manufacturer's literature describing components to be provided, giving manufacturer's name, product component name, and line number for each component.

C. Technical Submittals Include, but not limited to the following:
   1. Catalog information
   2. Batch Number, Heat Number, and chemical composition
   3. General Arrangements
   4. Assembly and disassembly or repair instructions
   5. Fabrication Drawings
   6. Detail Drawings
   7. Installation Drawings
   8. Manufacturer's Installation Instructions

D. Quality Assurance Submittals
   1. Provide manufacturer's certification that products to be used comply with specified requirements and are suitable for intended application.

TEMPLATE

1.06 QUALITY ASSURANCE

A. Qualifications
   1. Materials specified herein shall be the product of a reputable and qualified manufacturer who is of proven ability and has at least five (5) years of experience in the production of such equipment in sizes similar to those required on this project.
   2. Installer shall be an authorized representative trained and approved.

B. Identification – All steel shall be provided with an appropriate Material Test Report (MTR). Materials shall be properly labeled prior to shipment.

C. Inspections and Testing
   1. Bend Testing shall be performed on field samples per ACI 318. Bend testing shall be performed for batch of steel produced.
   2. Testing of samples shall be incorporated into project schedule.
      a. Testing will not be required if rebar manufacturer provides data for the batch not older than 24 months where bend testing has already been performed.

1.07 DELIVERY, STORAGE, AND HANDLING

A. All components and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment tools, and methods used in unloading, reloading, hauling, and shipping shall be such that components are not damaged.

B. For materials exceeding 50 pounds, lifting eyes and lifting lugs shall be provided to allow for installation.

C. Boxes and packages shall be properly marked to show its net and total weight, contents within the box and/or package.

D. Items shall be marked as identified in delivery schedule and as shown in Submittals and include a complete list and bills of materials with each shipment. Each item requiring assembly shall be properly tagged and marked.

E. If items are shipped separately, they shall be tagged and indicated as such to facilitate proper assembly on-site.

1.08 WARRANTY

A. Installer shall provide a warranty for all items furnished and installed in accordance with Section 01740. Warranty shall run concurrently with the Contractor's warranty and commence at final completion and CITY's acceptance.

B. Warranty shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate material selection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the installer.

PART 2– PRODUCTS

2.01 GENERAL

TEMPLATE

A. All design and material requirements listed herein shall adhere to the requirements of ACI 318. Additionally, all basins, clarifiers, or other concrete structures below finished grade shall meet the requirements of ACI 350.
B. The installation of reinforcement shall adhere to the requirements of the CRSI Manual of Standard Practice.

2.02 DESIGN

A. Concrete Structure Exposure Type
   1. The reinforcement material type for the concrete structure is based on the type of exposure. Refer to the table below for the exposure type of each concrete structure.

Concrete Structure	**Type of Exposure**
Sidewalks	Normal Exposure
Vaults	Normal Exposure
Box Culvert	Severe Exposure
Columns - Building Interior - 2nd Floor and higher	Normal Exposure
Columns - Building Interior - 1st Floor and lower	Severe Exposure
Columns - Exterior	Normal Exposure
Floors - Building Interior – 1st floor and lower	Severe Exposure
Floors - Building Interior - 2nd floor and higher	Normal Exposure
Walls - First floor and lower	Severe Exposure
Walls - 2nd Floor and higher	Normal Exposure
Influent/Effluent Channels	Severe Exposure
Trench Drains	Severe Exposure
Manholes	Severe Exposure
Wet Wells	Severe Exposure
Dry Wells	Severe Exposure
Clarifier Walls	Severe Exposure
Clarifier Bottoms	Severe Exposure
Basin Bottoms	Severe Exposure

B. Reinforcing Bars
   1. Include at least one terminal location for a grounding wire to be connected if designer chooses to cathodically-protect reinforcement. If terminal is not in use for protection, it must be covered and protected from weather. (snow, ice, dirt, debris)
   2. Single Bars can be replaced with bundle bars contingent upon
      a. Meeting the equivalent cross-sectional area of the single bar.
      b. Adhering to the table below. Number of Bundled bars excludes the splice bar.

TEMPLATE

Single Bar	#3	DNB								
	#4	DNB								
	#5	2	DNB							
	#6	4	2	DNB						
	#7	DNB	3	DNB	DNB					
	#8	DNB	3	2	DNB	DNB				
	#9	DNB	DNB	3	2	DNB	DNB			
	#10	DNB	DNB	4	2	2	DNB	DNB		
	#11	DNB	DNB	DNB	3	2	DNB	DNB	DNB	
	#14	DNB	DNB	DNB	DNB	3	2	2	DNB	DNB
	#18	DNB	DNB	DNB	DNB	DNB	DNB	4	3	2
		#3	#4	#5	#6	#7	#8	#9	#10	#11
		Bundled Bars								

DNB = Do Not Bundle

3. Bend Diameter
   a. The total hook length will be the summation of the bend length (90°, 135° degree, 180°), and the free end extension length.

Bend Requirements					
			Hook - Free End Extension Length		
Reinforcing Bar Size	Nominal Diameter	Minimum Bend Diameter	180 Deg. Bend	90 Deg. Bend	Stirrup and Tie Hooks 90 Deg or 135 Deg. Bend
	in.	in.	in.	in.	in.
#3	0.375	2 1/4	2 5/8	4 5/8	2 5/8
#4	0.5	3	2 5/8	6 1/8	3 1/8
#5	0.625	3 3/4	2 5/8	7 5/8	3 7/8
#6	0.75	4 1/2	3 1/8	9 1/8	4 5/8
#7	0.875	5 1/4	3 5/8	10 5/8	5 3/8
#8	1	6	4 1/8	12 1/8	6 1/8
#9	1.128	9 1/2	4 5/8	13 5/8	6 7/8
#10	1.27	10 3/4	5 1/8	15 2/8	7 5/8
#11	1.41	12	5 6/8	17	8 4/8
#14	1.693	18 1/4	6 7/8	20 3/8	10 2/8
#18	2.257	24	9 1/8	27 1/8	13 5/8

   b. Prefabrication Requirements
      (i) The following reinforcing bars to be used for curved surfaces may be fabricated/ bent on-site if the structure is built for normal exposure =and epoxy coating is not required.

TEMPLATE

Asset	Size	Minimum Bar Size
Columns	6 in. - 48 in.	#3 and Larger
Cylindrical Concrete Walls	Up to 25 ft. diameter	#5 and Larger
	Up to 70 ft. diameter	#7 and Larger
	Up to 100 ft. diameter	#8 and Larger
	Up to 200 ft. diameter	#9 and Larger

C. BAR SUPPORTS
   1. Bar supports shall be used for applications on the outer surface of concrete formwork that will be next to exposed earth. If the rebar is needing to be supported on the bottom of footings or slabs, dobies may also be used.
   2. Only to be used in applications for horizontal slabs and to maintain 3 in. of clearance from the exposed earth to rebar location. For all other applications, the use of Ties shall be utilized.
   3. For top mats of reinforcement located above bottom reinforcement mats, stirrups shall be utilized for support.

D. SPLICES
   1. Used for beams and/or girders that require bars longer than commonly available in industry.
   2. Butt splices shall be used in vertical bar applications. For welded bar butt splices, the bottom bar shall be square cut and the top bar shall be beveled on all sides of the top bar.
   3. Lap splices shall be used in lateral bar applications.

E. COLUMNS
   1. Spirals
      a. Spacing between each turn shall be no greater than 3inches or no greater than 1 1/3 max size aggregate used.
      b. Top and bottom include 1.5 extra turns.
   2. Column Ties
      a. Vertical bars in tied columns must be tied together laterally
      b. Lap splices not permitted for #14 and #18 bars.
   3. Bundled Bars
      a. May be used for Column Ties

F. COATINGS
   1. Rust-inhibitor coatings other than Epoxy coatings shall be approved by Engineer. Rust-inhibitor coatings may be used for concrete reinforcement considered normal exposures.

TEMPLATE

G. CONCRETE COVER

1. All concrete reinforcement shall have the minimum concrete cover as specified by ACI 318.
2. Cast-In-Place
   a. Cast against and permanently exposed to earth — 3.00 in.
   b. Exposed to earth or weather
      (i) #6 through #18 Bars — 2.00 in.
      (ii) #5 bar, W31 wire, D31 wire, and smaller — 1.50 in.
   c. Not exposed to weather or in contact with ground
   d. Slabs, Wall Joists
      (i) #14 and #18 bars — 1.50 in.
      (ii) #11 bar and smaller — 0.75 in.
   e. Beams, columns:
      (i) Primary reinforcement, ties, stirrups, spirals — 1.50 in.
   f. Shells, folded plate members:
      (i) #6 Bar and larger — 0.75 in.
      (ii) #5 Bar, W31 wire, D31 wire, and smaller — 0.50 in.
3. Precast
   a. Exposed to earth or weather
      (i) Wall panels
         1. #14 and #18 Bars — 1.500 in.
         2. #11 Bar and smaller — 0.750 in.
      (ii) Other members
         1. #14 and #18 Bars — 2.000 in.
   b. Not exposed to weather or in contact with ground
      (i) Slabs, walls, joists
         1. #14 and #18 Bars — 1.250 in.
         2. #11 Bar and smaller — 0.625 in.
      (ii) Beams, columns, primary reinforcement — Min. 0.625 in.; Max. 1.500 in.
      (iii) Ties, stirrups, and spirals — 0.375 in.
      (iv) Shells, folded plate members
         1. #6 Bar and larger — 0.625 in.
         2. #5 Bar, W31 Wire, D31 Wire, and smaller — 0.375 in.

2.03 MATERIALS

A. Welded Wire Fabric is only permitted for sidewalks not exceeding 6 ft width.
B. Exposures
   1. Normal Exposure
      a. Billets, #X Bar, ASTM A615, Grade 60, Rust-Inhibitive Coat
      b. Rail, #X Bar, ASTM A998 Grade 60, Rust-Inhibitive Coat
      c. Axle, #X Bar, ASTM A998 Grade 60, Rust-Inhibitive Coat
      d. Low Alloy, #X Bar, ASTM A706, Grade 60, Rust-Inhibitive Coat

TEMPLATE

e. Deformed Wire Fabric, Welded, #X, ASTM A497 Grade 60, Rust-Inhibitive Coat
f. Tie Wire, #16 Gauge, ASTM A580 316SS

2. Severe Exposure
   a. #3 Bar - #5 Bar
      - Billets, #X Bar, ASTM A615, Grade 60, ASTM A775 Epoxy Coat, 9-12 mils DFT
      - Rail, #X Bar, ASTM A998 Grade 60, ASTM A775 Epoxy Coat, 9-12 mils DFT
      - Axle, #X Bar, ASTM A998 Grade 60, ASTM A775 Epoxy Coat, 9-12 mils DFT
      - Low Alloy, #X Bar, ASTM A706 Grade 60, ASTM A775 Epoxy Coat, 9-12 mils DFT
   b. #6 Bar - #11 Bar
      - Billets, #X Bar, ASTM A615, Grade 60, ASTM A775 Epoxy Coat, 12-16 mils DFT
      - Rail, #X Bar, ASTM A998 Grade 60, ASTM A775 Epoxy Coat, 12-16 mils DFT
      - Axle, #X Bar, ASTM A998 Grade 60, ASTM A775 Epoxy Coat, 12-16 mils DFT
   c. #6 Bar - #11 Bar
      - Low Alloy, #X Bar, ASTM A706 Grade 60, ASTM A775 Epoxy Coat, 12-16 mils DFT
   d. Tie Wire, #16 Gauge, ASTM A580 316SS, PVC coated.
      - Must be used exclusively when Epoxy-coated rebar is required.

PART 3– EXECUTION

3.01 SURFACE PREPARATION

A. All rebar shall have a SSPC-SP10 near-white finish.

3.02 COATING APPLICATION

A. All coatings shall be applied after all bending of rebar has been applied. Coatings shall not be performed before rebar has been bent. Surfaces shall be free of surface oxidation before application of coating has commenced.
B. Reinforcements with epoxy coatings shall adhere to the requirements of ASTM A934.
C. For welded joints, a spray application of coating shall be reapplied after the weld has been performed with a thickness no less than the fusion-bonded epoxy coating.
D. For more information on coating of steel, refer to Section 09960 – Steel Coatings.

3.03 REINFORCEMENT INSTALLATION

TEMPLATE

A. Prior to any pouring of concrete over reinforcement, the coating on the reinforcement shall be inspected and free of holiday defects, scratches, pinholes, or other defects that could inhibit the coating's ability to protect the reinforcement from corrosion.
B. All dowel rebar shall be capped per OSHA requirements until concrete is poured into formwork.
C. Waterstops may be installed after passing inspection and installed within concreted formwork. Refer to Section Section 03153 – Waterstops.

END OF SECTION

TEMPLATE

SECTION 03600 – GROUT

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers cementitious grout and epoxy grout used throughout wastewater facilities.

B. Contractor shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:
   1. Section 03900 – Concrete Restoration and Cleaning
   2. Section 04220 – Concrete Masonry Units

1.03 REFERENCES

A. American Concrete Institute (ACI)
   1. 351 – Grouting between Foundations and Bases for Support of Equipment and Machinery
   2. 503R – Use of Epoxy Compounds With Concrete

B. American Society of Testing and Materials (ASTM)
   1. C109 – Standard Test Method for Compressive Strength of Hydraulic Cement Mortars using 2-inch cube specimens
   2. C267 – Standard Test Methods for Chemical Resistance of Mortars, Grouts, and Monolithic Surfacings and Polymer Concretes
   3. C531 – Standard Test Method for Liner Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant mortars, Grouts, Monolithic Surfacings, and Polymer Concretes
   4. C579 – Standard Test Method for Compressive Strength of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing's and Polymer Concretes.
   5. C580 – Standard Test Method for Flexural Strength and Modulus of Elasticity of chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes
   6. C1107 – Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-Shrink)
   7. C1181 – Standard Test Methods for Compressive Creep of Chemical-Resistant Polymer Machinery Grouts.

C. International Concrete Repair Institute (ICRI)
   1. Guideline 310.2 – Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays

TEMPLATE

1.04 SUBMITTALS

A. Submit as specified in Section 01019 – Closeout Procedures.
B. Submit manufacturer's literature describing components to be provided, giving manufacturer's name, product component name, and line number for each component.
C. Quality Assurance Submittals
    1. Provide manufacturer's certification that products to be used comply with specified requirements and are suitable for intended application.

1.05 QUALITY ASSURANCE

A. Qualifications
    1. Materials specified herein shall be the product of a reputable and qualified manufacturer who is of proven ability and has at least five (5) years of experience in the production of such equipment in sizes similar to those required on this project.
    2. Installer shall be an authorized representative trained and approved.
B. Identification – All materials shall be labeled and provided with an appropriate Safety Data Sheet and properly labeled prior to shipment.
C. Inspections and Testing
    1. Compressive Strength of cementitious grouts shall be determined per ASTM C109
    2. Chemical Resistance of grouts shall be determined per ASTM C267.
    3. Coefficients of Thermal Expansions shall be determined per ASTM C531.
    4. Compressive Strength of epoxy grouts shall be determined per ASTM C579.
    5. Compressive Creep of epoxy grouts shall be determined per ASTM C1181.
    6. Testing of samples shall be incorporated into project schedule.
        a. Testing will not be required if grout manufacturer provides data based on testing not older than 24 months of grout products for adhesion to and compatibility with substrates and other materials used in this application.

1.06 DELIVERY, STORAGE, AND HANDLING

A. All components and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment tools, and methods used in unloading, reloading, hauling, and shipping shall be such that components are not damaged.
B. For materials exceeding 50 pounds, lifting eyes and lifting lugs shall be provided to allow for installation.
C. Boxes and packages shall be properly marked to show its net and total weight, contents within the box and/or package.
D. Items shall be marked as identified in delivery schedule and as shown in Submittals and include a complete list and bills of materials with each shipment. Each item requiring assembly shall be properly tagged and marked.
E. If items are shipped separately, they shall be tagged and indicated as such to facilitate proper assembly on-site.

1.07 WARRANTY

TEMPLATE

A. Installer shall provide a warranty for all items furnished and installed in accordance with Section 01740. Warranty shall run concurrently with the Contractor's warranty and commence at final completion and CITY's acceptance.
B. Warranty shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate material selection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the installer.

PART 2– PRODUCTS

2.01 GENERAL

A. All products listed herein are approved for use. Any product to be approved by CITY must be a product from a CITY-approved manufacturer.
B. Installation of products must comply with manufacturer's written installation procedures and individual product data sheet application bulletins.

2.02 ACCEPTABLE MANUFACTURERS

1. Cementitious Grouts
   a. Masterbuilders Inc.
   b. Sauereisen Cements
   c. Sika Corporation inc.
   d. Five Star Products Inc.
   e. L&M Construction Chemicals Inc.
2. Epoxy Grouts
   a. BASF Construction Chemicals, Inc.
   b. Five Star Products Inc.
   c. L&M Construction Chemicals Inc.

2.03 Products

A. Cementitious Grout - ASTM C1107 Grade C
B. Epoxy Grout

1. Compressive Strength (ASTM C579 B)	9600 psi at 24 hours 15000 psi at 28 days
2. Flexural Strength (ASTM C580)	4700 psi
3. Tensile Strength (ASTM C307)	2000 psi
4. Height Change	Positive Expansion
5. Effective Bearing Area	> 95%
6. Creep (ASTM C1181)	<= 4.2 x 10^{-3} in/in
7. Coefficient of Thermal Expansion	24.5 x 10^{-6} in/in°F

2.04 FEATURES

A. All grouts shall be non-shrink and flowable.

2.05 APPLICATIONS

TEMPLATE

A. Cementitious Grouts shall be used in the following applications:
    1. Concrete Masonry Grout – Refer to Section 04220 – Concrete Masonry Units
    2. Anchorage to Foundations including:
        a. Structural Steel columns
        b. High-Mast Lighting
        c. Low-Mast Lighting
        d. Tank/Vessel Supports
        e. Building Shells
    3. Filling of honeycombs or voids in non-water bearing surfaces
B. Epoxy Grouts shall be used in the following applications
    1. Anchorage to Foundations including:
        a. Rotating Equipment
        b. Reciprocating Equipment
        c. Vibrating Equipment
    2. Filling of honeycombs or voids in
        a. Water bearing surfaces
        b. Foundations and Floors supporting chemical tanks
        c. Foundations below the water table.
    3. Tiling
C. Color – (As specified by Engineer or Architect)

PART 3– EXECUTION

3.01 SURFACE PREPARATION

A. Mechanical abrasion shall be used for surface preparation. The surface roughness of any foundation will range from CSP-6 to CSP-9.
B. Surface preparation is not required for usage of grout with Concrete Masonry Units.
C. Presoak concrete surface continuously ranging from 8 hours to 24 hours prior to grouting. At the completion of presoaking, remove any standing water.

3.02 INSTALLATION

A. All formwork surfaces shall be pre-treated with a bond-inhibitor before grout fills the form.
B. Grout shall be applied per the manufacturer's instructions.
C. If using grout within a baseplate, first confirm the baseplate has means to release air at the opposite end of the pour.
D. After grout has cured, remove all formwork. If formwork had misapplied bond-inhibitor, Contractor shall take precaution to remove formwork without affecting finished grout.

END OF SECTION

TEMPLATE

SECTION 03630 – EPOXIES

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers epoxies, epoxy gels, and epoxy bonding agents used throughout wastewater facilities.

B. Contractor shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:
   1. Section 03900 – Concrete Restoration and Cleaning

1.03 REFERENCES

A. American Society of Testing and Materials (ASTM)
   1. C881 – Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete
   2. C882 – Standard Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Sheet
   3. C883 – Standard Test Method for Effective Shrinkage of Epoxy-Resin Systems Used with Concrete
   4. D638 – Standard Test Method for Tensile Properties of Plastics
   5. D695 – Standard Test Method for Compressive Properties of Rigid Plastics

B. International Code Council (ICC)
   1. International Building Code (IBC) 2018 with City of Kansas City, MO Amendments

C. Society for Protective Coatings (SSPC)
   1. SP-10 – Near White Metal Blast Cleaning

1.04 DEFINITIONS

A. Existing – Pertaining to concrete objects that have already been cured

B. New – New objects being adhered to with object including fresh concrete and/or equipment or hatches.

C. Injection – Epoxy application process of filling voids within concrete after capping the crack.

1.05 SUBMITTALS

A. Submit as specified in Section 01019 – Closeout Procedures.

B. Submit manufacturer's literature describing components to be provided, giving manufacturer's name, product component name, and line number for each component.

C. Quality Assurance Submittals

TEMPLATE

1. Provide manufacturer's certification that products to be used comply with specified requirements and are suitable for intended application.

1.06 QUALITY ASSURANCE

A. Qualifications
   1. Materials specified herein shall be the product of a reputable and qualified manufacturer who is of proven ability and has at least five (5) years of experience in the production of such equipment in sizes similar to those required on this project.
   2. Installer shall be an authorized representative trained and approved.

B. Identification – All materials shall be labeled and provided with an appropriate Safety Data Sheet and properly labeled prior to shipment.

C. Inspections and Testing
   1. The tensile properties of each epoxy shall be determined per ASTM D638.
   2. Compressive properties of each epoxy shall be determined per ASTM D695.
   3. Epoxy equivalent shall be such that the compressive strength with fillers is not less than the concrete it is binding to.
   4. Testing of samples shall be incorporated into project schedule.
      a. Testing will not be required if sealant manufacturer provides data based on testing not older than 24 months of epoxy products for adhesion to and compatibility with substrates and other materials used in this application.

1.07 DELIVERY, STORAGE, AND HANDLING

A. All components and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment tools, and methods used in unloading, reloading, hauling, and shipping shall be such that components are not damaged.

B. For materials exceeding 50 pounds, lifting eyes and lifting lugs shall be provided to allow for installation.

C. Boxes and packages shall be properly marked to show its net and total weight, contents within the box and/or package.

D. Items shall be marked as identified in delivery schedule and as shown in Submittals and include a complete list and bills of materials with each shipment. Each item requiring assembly shall be properly tagged and marked.

E. If items are shipped separately, they shall be tagged and indicated as such to facilitate proper assembly on-site.

1.08 WARRANTY

A. Installer shall provide a warranty for all items furnished and installed in accordance with Section 01740. Warranty shall run concurrently with the Contractor's warranty and commence at final completion and CITY's acceptance.

B. Warranty shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate material selection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the installer.

TEMPLATE

PART 2– PRODUCTS

2.01 GENERAL

A. All products listed herein are approved for use. Any product to be approved by CITY must be a product from a CITY-approved manufacturer.
B. Installation of products must comply with manufacturer's written installation procedures and individual product data sheet application bulletins.

2.02 ACCEPTABLE MANUFACTURERS

1. BASF
2. Dayton Superior
3. Sika Corporation

2.03 APPLICATIONS

A. The epoxy used will depend on the type of application of the epoxy. For the type of Epoxy used, refer to the application table below. The physical requirements of the Epoxy selection shall be no less than the minimum of the physical requirements in ASTM C881.

Epoxy Classification				
Object 1	Object 2	Condition Obj.1 - Condition Obj. 2	Adhesion Type	Epoxy Selection
Non-Load Bearing Wall		Existing	Injection	Type I Grade 1
Non-Load Bearing Wall		Existing	Exposed Rebar	Type I Grade 3
Non-Load Bearing Wall	Non-Load Bearing Wall	Existing	Surface Crack	Type I Grade 3
Non-Load Bearing Wall	Non-Load Bearing Wall	Existing - Existing	Mate	Type II Grade 3
Non-Load Bearing Wall	Non-Load Bearing Wall	Existing - New	Mate	Type II Grade 3
Load Bearing Floor		Existing	Injection	Type IV Grade 1
Load Bearing Floor		Existing	Surface Crack	Type IV Grade 2
Load Bearing Floor		Existing	Exposed Rebar	Type IV Grade 2
Load Bearing Floor	Hatch	Existing - New	Mate	Type IV Grade 3
Load Bearing Wall		Existing	Injection	Type IV Grade 1
Load Bearing Wall		Existing	Exposed Rebar	Type IV Grade 3
Load Bearing Wall		Existing	Surface Crack	Type IV Grade 3

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Load Bearing Wall	Load Bearing Wall	Existing - New	Mate	Type IV Grade 3

B. For all other applications not listed herein, Contractor shall coordinate with Owner's Representative for approval of selected epoxy. In general, the grade of epoxy/Viscosity is based on the following application locations.
   1. Voids within Cracks – Grade 1
   2. Horizontal Surfaces – Grade 2
   3. Vertical Surfaces – Grade 3

C. The Class of Epoxy used shall be dependent on the temperature of the concrete it is adhered to. Use the following table for Class Determination

Normal Conditions	Class C
Cold-Weather Concreting	Class A
Hot-Weather Concreting	Class F

D. Color – (Match existing application surface)

PART 3– EXECUTION

3.01 INSTALLATION

A. Epoxies shall be applied per the manufacturer's instructions.
B. For the use of epoxy in the restoration of concrete, refer to Section 03900 – Concrete restoration and cleaning.

END OF SECTION

TEMPLATE

SECTION 03900 – CONCRETE RESTORATION AND CLEANING

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers concrete restoration for existing wastewater facilities.

B. Contractor shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:
   1. Section 03100 – Concrete Forms & Accessories
   2. Section 03153 – Waterstops
   3. Section 03200 – Concrete Reinforcement
   4. Section 03630 – Epoxies
   5. Section 09961 – Concrete Coatings

1.03 REFERENCES

A. American Concrete Institute (ACI)
   1. 304R – Guide for Measuring, Mixing, Transporting, and Placing Concrete
   2. 309 – Recommended Practice for Consolidation of Concrete
   3. 318 – Building Code Requirements for Reinforced Concrete
   4. 347 – Recommended Practice for Concrete Formwork
   5. 350 – Code Requirements for Environmental Engineering Concrete Structures and Commentary

B. American Society of Testing and Materials (ASTM)
   1. C881 – Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete
   2. C882 – Standard Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Sheet
   3. C883 – Standard Test Method for Effective Shrinkage of Epoxy-Resin Systems Used with Concrete
   4. C1713 -

C. International Code Council (ICC)
   1. International Building Code (IBC) 2018 with City of Kansas City, MO Amendments

D. Society for Protective Coatings (SSPC)
   1. SP-10 – Near White Metal Blast Cleaning

1.04 DEFINITIONS

A. Cold weather – period when for more than 3 successive days the mean daily temperature drops below 40°F.
B. F_C' – Minimum compressive strength of concrete
C. Lightweight aggregates – Aggregates with the intended use in concrete masonry units.
D. Normal-weight aggregate – Aggregates for use in concrete
E. O.D. – Outside Diameter
F. Severe Exposure – As defined by ACI 211, Concrete which is exposed to deicing chemicals or other aggressive agents or where the concrete may become highly saturated by continual contact with moisture or free water prior to freezing.
G. Vented Heaters – Heaters which exhaust flue gases directly to atmosphere and do not enter the heated space.
H. Water-reducing admixture – may also be referred to as "Plasticizer"

1.05 SUBMITTALS

A. Submit as specified in Section 01019 – Closeout Procedures.

B. Submit manufacturer's literature describing components to be provided, giving manufacturer's name, product component name, and line number for each component.

C. Technical Submittals Include, but not limited to the following:
   1. Catalog data
   2. Installation Manual
   3. Performance Data

D. Quality Assurance Submittals
   1. Provide manufacturer's certification that products to be used comply with specified requirements and are suitable for intended application.

1.06 QUALITY ASSURANCE

A. Qualifications
   1. Materials specified herein shall be the product of a reputable and qualified manufacturer who is of proven ability and has at least five (5) years of experience in the production of such equipment in sizes similar to those required on this project.
   2. Installer shall be an authorized representative trained and approved.
B. Preconstruction Testing
   1. Locate and conduct a field test for each kind of sealant and joint substrate
   2. Provide 7 calendar day notice to CITY's representative when test joints will be erected.
   3. Arrange for joint sealant manufacturer's technical representative to be present during test
   4. Provide a report if the test passed, or failed. If failed, identify the likely cause of failure.
   5. For tests with passing adhesives, sealant shall be considered satisfactory.

1.07 DELIVERY, STORAGE, AND HANDLING

A. All components and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment tools, and methods used in unloading, reloading, hauling, and shipping shall be such that components are not damaged.
B. For materials exceeding 50 pounds, lifting eyes and lifting lugs shall be provided to allow for installation.
C. Boxes and packages shall be properly marked to show its net and total weight, contents within the box and/or package.
D. Items shall be marked as identified in delivery schedule and as shown in Submittals and include a complete list and bills of materials with each shipment. Each item requiring assembly shall be properly tagged and marked.
E. If items are shipped separately, they shall be tagged and indicated as such to facilitate proper assembly on-site.

1.08 WARRANTY

A. Installer shall provide a warranty for all items furnished and installed in accordance with Section 01740. Warranty shall run concurrently with the Contractor's warranty and commence at final completion and CITY's acceptance.
B. Warranty shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate material selection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the installer.

PART 2– PRODUCTS

2.01 GENERAL

A. All products listed herein are approved for use. Any product to be approved by CITY must be a product from a CITY-approved manufacturer.
B. Installation of products must comply with manufacturer's written installation procedures and individual product data sheet application bulletins. If no DFT is listed herein, product shall be applied per product data pages. Any discrepancies shall be reported to CITY's representative and Paint Manufacturer's Representative.

2.02 ACCEPTABLE MANUFACTURERS

A. MORTAR
    1. Tnemec
    2. Sherwin Williams
B. EPOXY
    1. Sika
C. CAULK
    1. Sika

2.03 REPAIR MORTAR

A. Concrete Surface Areas Equal to or Greater than ½" Deep

1. Sherwin-Williams AW Cook Rapid Vertical Repair Mortar

B. Concrete Surface Areas Less than ½" Deep
   1. Sherwin-Williams AW Cook Thin Patchless Repair Mortar

2.04 EPOXIES

A. If not listed herein, refer to Section 03630 – Epoxies.
B. Rebar Coating
   1. Sherwin-Williams Macropoxy 646 Epoxy B58W610/B58V600 – 5.0-10.0 mils DFT
C. Repair Epoxy
   1. Sika Coporation Sikadur Hi-Mod LV
D. Injection Epoxy
   1. Sika Corporation Sikadur Hi-Mod LV

PART 3– EXECUTION

3.01 SITE CONDITIONS

A. Contractor shall field verify necessary volumes, areas, dimensions, and quantities required to complete Work.
B. Work area shall be examined for conditions under which application of coating systems shall be performed for conditions that will adversely affect execution, permanence, or quality of coating system application. Any conditions identified as detrimental and unsatisfactory for Work under this Section shall be corrected prior to commencement of coating application. Any commencement of installation constitutes an acceptance of conditions and responsibility for satisfactory performance by Contractor.
C. Contractor shall maintain a clean site. Refuse, solid waste, hazardous waste, toxic waste, or trash from consumables shall be properly disposed of in designated containers. Paints and solvents shall not be disposed of by pouring on the ground. Solvent-soaked rags and oil soaked rags shall be returned for contaminant recovery and laundering.
D. Any items or flammable objects no longer in use shall be properly removed and/or disposed of as to prevent fire hazards and spontaneous combustion.
E. Any items considered Household Hazardous Waste may be taken to the Household Hazardous Waste facility located at 4707B Deramus Ave, Kansas City, MO 64120. Accepted Household Hazardous Waste items are as follows:
   1. Antifreeze
   2. Fuels
   3. Hazardous Cleaners
   4. Hazardous Liquids
   5. Household Cleaners
   6. Paint
   7. Solvents
   8. Thinners
   9. Used Oils

Refer to kcwater.us/programs/hhw for the full list of acceptable items that may be dropped off and the hours of operation.

F. Contractor shall be responsible for costs associated with containment and waste disposal that may result from execution of this Project.

3.02 EXAMINATION

A. Examine areas and conditions under application of coating system shall be performed for conditions that will adversely affect execution, permanence, or quality of coating system application.
B. Air intakes, returns, or other air breathing equipment which may pull air near fresh coatings shall be covered.
C. Storage area shall be clean and neat at all times.
D. Any non-anticipated conditions or joint design arise, Contractor shall notify CITY and consult with material manufacturer for recommendations. Sealants must be fully cured prior to application of concrete primers.

3.03 CONCRETE REPAIR/RESTORATION

A. Opaque concrete sealer system shall consist of one or more systems for protection of concrete or masonry surfaces.
    1. Repair of Bug Holes & Honeycombs – Designated areas of concrete surfaces shall receive application as required to fill all voids and surfaces are restored to original as-built surface plane. Fins and protrusions shall be removed by grinding or other suitable means.
    2. Crack and Joint Details – Exposed cracks, construction joints, contraction joints, and isolation joints shall be prepared and detailed in accordance with manufacturer's recommendations.
    3. Carbon Steel Rebar - Exposed carbon steel rebar shall be abrasive blasted in accordance with SSPC SP10. All exposed carbon steel rebar surfaces shall receive an epoxy coating. Any non-exposed carbon-steel rebar requires no additional coatings.

3.04 REBAR COATING

A. Loose concrete surrounding exposed rebar shall be chipped loose. Upon completion of chipping, a minimum of 1" clearance shall be maintained around rebar.
B. Rebar shall be abrasive blasted in accordance with SSPC SP10. Rebar surfaces shall receive an epoxy coating. Any non-exposed carbon-steel shall not require no additional coatings.
C. After epoxy coating of rebar has been applied and cured, the remaining void shall be filled in the same manner as concrete surface repair listed herein.

3.05 SURFACE REPAIR

A. Method of repair shall be determined based upon whether the area is greater than ½ in. deep or area less than ½ in. deep.

1. Areas greater than ½ in deep: Vertical Repair Mortar.
2. Areas less than ½ in. deep: Patchless Repair Mortar.

B. After complete curing, surface shall be ground smooth to the area extending 6” beyond the concrete repair.

3.06 CRACK REPAIR

A. EPOXY INJECTION

1. Remove all loose debris using mechanical abrasion methods. (wire brush and other acceptable means). After removal with wire brush, compressed air shall be used to blow out all dust to allow for good adhesion of epoxy.
2. Capping the Crack
   a. Apply repair epoxy along the length of the crack. Leave space along the duration of the crack for epoxy injection ports. Epoxy injection ports shall be separated by a distance of 8 – 10 inches unless superceded by manufacturer’s instructions.
   b. Smooth the epoxy with a putty knife. Repair epoxy should be a width of 1-2” inches along the length of the crack.
   c. Repair epoxy should be applied to the injection port base. After applied, the port passageway should NOT be obstructed by repair epoxy.
   d. For the spaces left for epoxy injection ports, apply injection port bases at the center of the crack. Smooth the area around the base with repair epoxy and areas are free of pinholes in substrate.
   e. Allow for all repair epoxy to cure including the epoxy used to adhere injection ports.
   f. Epoxy injection port order:
      (i) For vertical surfaces, start at the lowest port first and move to the next lowest port.
      (ii) For horizontal surfaces, start at the widest part of the crack and move to the next port.
   g. Inject epoxy in a port until epoxy begins to fill the next port along the crack.
   h. After all ports have been injected with epoxy, allow for curing to complete in accordance with manufacturer’s instructions.
   i. After complete curing, remove injection ports with hammer or other acceptable means and ground smooth the area of the injection ports and the repair epoxy.

3.07 JOINT RESTORATION

A. WATERSTOP REPAIR

1. PVC waterstop
   a. If the damaged area is on a exposed flat area of PVC, PVC patches may be used.
2. Construction joints
   a. Hydrophilic strip-applied waterstop and a hydrophilic caulk may be used.
   b. Clean area of all dirt and debris.

c. Apply hydrophilic caulk to concrete on both sides of damaged waterstop. Extend caulk application beyond the damaged area in accordance with manufacturer's instructions.
d. Apply strip-applied waterstop along the existing waterstop profile and to the outer edge of waterstop.

3.08 COATING

A. After all cracks, joints, surfaces have been repaired and ground smooth, coating of concrete can commence. Refer to Section 09961 – Concrete Coatings.

END OF SECTION

SECTION 04220 – CONRETE MASONRY UNITS

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes:
   1. Concrete masonry units
   2. Mortar and grout
   3. Steel reinforcing bars
   4. Masonry-joint reinforcement
   5. Embedded flashing
   6. Miscellaneous masonry accessories.

1.02 RELATED SECTIONS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.
B. Related Sections include the following.
   1. Section 07620 – Sheet Metal Flashing and Trim
   2. Section 07840 - Firestopping

1.03 REFERENCES

A. American Concrete Institute (ACI)
   1. 315 – Details and Detailing of Concrete Reinforcement
B. American Society of Civil Engineers (ASCE)
   1. 5 – Building Code Requirements
   2. 6 – Specification for Masonry Structures
C. American Society of Testing and Materials (ASTM)
   1. A36/A36M – Standard Specification for Carbon Structural Steel
   2. A82/A82M – Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
   3. A153/A153M – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
   4. A240/A240M – Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
   5. A615/A615M – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
   6. A666 – Standard Specification for Annealed or Cold-Worked Austenitic Stainless-Steel Sheet, Strip, Plate, and Flat Bar
   7. A951/A951M – Standard Specification for Masonry Joint Reinforcement
   8. A996/A996M – Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement
   9. A1008/A1008M – Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength, Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable
   10. C90 – Standard Specification for Loadbearing Concrete Masonry Units
   11. C91/C91M – Standard Specification for Masonry Cement
   12. C109/C109M – Standard Test Method for Compressive Strength of Hydraulic Cement Mortars
   13. C114 – Standard Test Methods for Chemical Analysis of Hydraulic Cement
   14. C143/C143M – Standard Test Method for Slump of Hydraulic-Cement Concrete
   15. C144 – Standard Specification for Aggregate for Masonry Mortar

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16. C150 – Standard Specification for Portland Cement
17. C207 – Standard Specification for Hydrated Lime for Masonry Purposes
18. C331/C331M – Standard Specification for Lightweight Aggregates for Concrete Masonry Units
19. C404 – Standard Specification for Aggregates for Masonry Grout
20. C476 – Standard Specification for Grout for Masonry
21. C494 – Standard Specification for Chemical Admixtures for Concrete
22. C549 – Standard Specification for Perlite Loose Fill Insulation
23. C578 – Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
24. C1019 – Standard Test Method for Sampling and Testing Grout for Masonry
25. C1093 – Standard Practice for Accreditation of Testing Agencies for Masonry
26. C1314 – Standard Test Method for Compressive Strength of Masonry Prisms
27. C1506 – Standard Test Method for Water Retention of Hydraulic Cement-Based Mortars and Plasters
28. D226/D226M – Standard Specification for Asphalt-Saturated Organic Felt
29. D1056 – Standard Specification for Flexible Cellular Materials – Sponge or Expanded Rubber
30. D2000 – Specifications for Rubber Materials
31. D2287 – Standard Classification System and Basis for Specification for Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds
32. E514/E514M – Standard Test Method for Water Penetration and Leakage Through Masonry

D. National Concrete Masonry Association (NCMA)
   1. TEK 8-4A – Cleaning Concrete Masonry
E. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)

1.04 DEFINITIONS
A. ASCE 5 – Building Code Requirements may also be referred to as ACI 530 and TMS 402
B. ASCE 6 – Specification for Masonry Structures may also be referred to as ACI 530.1 and TMS 602
C. CMU(s) – Concrete masonry unit(s)
D. Reinforced Masonry – Masonry containing reinforcing steel in grouted cells.
E. Wythe – vertical section of masonry one (1) unit in thickness

1.05 PREINSTALLATION MEETINGS
A. Pre-installation Conference: Conduct conference at Project site.

1.06 ACTION SUBMITTALS
A. Product Data: For each type of product.
B. Shop Drawings; For the following:
   1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
   2. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.
   3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

1.07 INFORMATION SUBMITTALS
A. Qualification Data: For testing agency.
B. Material Certificates: For each type and size of the following:
   1. Masonry units.
      a. Include data on material properties.
      b. For masonry units used in structural masonry, include data and calculations establishing

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average net-area compressive strength of units.
2. Integral water repellant used in CMUs.
3. Cementitious materials. Include name of manufacturer, brand name, and type.
4. Mortar admixtures.
5. Pre-blended, dry mortar mixes. Include description of type and proportions of ingredients.
6. Grout mixes. Include description of type and proportions of ingredients.
7. Reinforcing bars.
8. Joint reinforcement.
9. Anchors, ties, and metal accessories.

C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
   1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C109/C109M for compressive strength, ASTM C1506 for water retention, and ASTM C91/C91M for air content.
   2. Include test reports, according to ASTM C1019, for grout mixes required to comply with compressive strength requirement.

D. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to ASCE 6.

E. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.08 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM C1093 for testing indicated

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Build mockup of typical wall area as shown on Drawings.
   2. Build mockups for typical exterior and interior walls in sizes approximately 60 in. long by 60 inches high by full thickness, including face and backup wythes and accessories.
      a. Include a sealant-filled joint at least 16 in. long in exterior wall mockup.
      b. Include lower corner of window opening at upper corner of exterior wall mockup. Make opening approximately 12 in. wide by 16 in. high.
      c. Include through-wall flashing installed for a 24 in. length in corner of exterior wall mockup approximately 16 in. down from top of mockup, with a 12 in. length of flashing left exposed to view (omit masonry above half of flashing).
   3. Protect accepted mockups from the elements with weather-resistant membrane.
   4. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
      a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
      b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   5. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Acceptance Testing.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet,

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do not install until they are dry.

B. Deliver pre-blended, dry mortar mix in moisture-resistant containers. Store pre-blended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.

C. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.010 FIELD CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
   1. Extend cover a minimum of 24 in. down both sides of walls, and hold cover securely in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
   1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
   2. Protect sills, ledges, and projections from mortar droppings.
   3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
   4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ASCE 6.
   1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40°F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ASCE 6.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.02 UNIT MASONRY, GENERAL

A. Masonry Standard: Comply with ASCE 6 except as modified by requirements in the Contract Documents.

B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.

C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

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1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

2.03 CONCRETE MASONRY UNITS (CMUs)

A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
   1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
   2. Provide square-edged units for outside corners unless otherwise indicated.
   3. All units exposed to view will be Decorative CMU(s). All units exposed to view in interior areas where they are subjected to wash down are to be burnished or polished CMU(s)

B. Integral Water Repellent: Provide units made with integral water repellent for exposed units and where indicated.
   1. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested according to ASTM E514/E514M as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive, with test period extended to 24 hours, shall show no visible water or leaks on the back of test specimen.
      a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
         i. ACM Chemistries.
         ii. BASF Corporation.
         iii. Euclid Chemical Company (The); an RPM company.

C. Insulated CMU(s): Where indicated, units shall contain rigid, specially shaped, molded- polystyrene insulation units complying with ASTM C578, Type I, designed for installing in cores of masonry units.

D. CMU(s) and Decorative CMU(s): ASTM C90.
   1. Size (Width): Manufactured to dimensions 3/8 in. less-than-nominal dimensions.

2.04 MASONRY LINTELS

A. General: Provide one of the following:

B. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMU(s) matching adjacent CMU(s) in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.05 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
   1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C114.

B. Hydrated Lime: ASTM C207 Type S.

C. Aggregate for Mortar: ASTM C144.
   1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
   2. For joints less than ¼ in. thick, use aggregate graded with 100% passing the No. 16 sieve.
   3. White-Mortar Aggregates: Natural white sand or crushed white stone.
   4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

D. Aggregate for Grout: ASTM C404.

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E. Cold-Weather Admixture: Non-chloride, noncorrosive, accelerating admixture complying with ASTM C494/C494M Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. BASF Corporation.
      b. Euclid Chemical Company (The); an RPM company.
      c. GCP Applied Technologies Inc.

F. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMU(s) containing integral water repellent from same manufacturer.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. BASF Corporation.
      b. Euclid Chemical Company (The); an RPM company.
      c. GCP Applied Technologies Inc.

G. Water: Potable.

2.06 REINFORCEMENT

A. Uncoated Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M Grade 60.

B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148 in. steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Dur-O-Wal; a Hohmann & Barnard company.
      b. Heckmann Building Products, Inc.
      c. Hohmann & Barnard, Inc.

C. Masonry-Joint Reinforcement,
   1. General: Ladder type complying with ASTM A951/A951M. Provide in lengths of not less than 10 ft., with prefabricated corner and tee units.
   2. Walls
      a. Interior Walls: Hot-dip galvanized carbon steel.
      b. Exterior Walls: Hot-dip galvanized carbon steel.
   3. Side Rods:
      a. Wire Size: 0.187 in. diameter
   4. Cross Rods:
      a. Wire Size: 0.187 in. diameter
      b. Spacing: Not more than 16 inches o.c.

2.07 TIES AND ANCHORS

A. General: Ties and anchors shall extend at least 1-1/2 in. into masonry but with at least a 5/8 in. cover on outside face.

B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
   1. Stainless Steel Wire: ASTM A580 316SS (Preferred)
   2. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A82/A82M, with ASTM A153/A153M, Class B-2 coating.
   3. Steel Sheet, Galvanized after Fabrication: ASTM A1008/A1008M Commercial Steel, with ASTM A153/A153M Class B coating.

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4. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

C. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
   1. Anchor Section for Welding to Steel Frame: Crimped 1/4 in. diameter, hot-dip galvanized steel wire.
   2. Tie Section: Triangular-shaped wire tie made from 0.25 in. diameter, hot-dip galvanized steel wire.

D. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
   1. Tie Section: Triangular-shaped wire tie made from 0.25 in. diameter, hot-dip galvanized steel wire.

E. Partition Top Anchors: 0.105 in. thick metal plate with a 3/8 in. diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.

F. Rigid Anchors: Fabricate from steel bars 1-1/2 in. wide by 1/4 in. thick by 24 in. long with ends turned up 2 inches or with cross pins unless otherwise indicated.
   1. Corrosion Protection: Hot-dip galvanized to comply with ASTM A153/A153M.

2.08 EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:
   1. Stainless Steel:
      a. ASTM A240/A240M or
      b. ASTM A666, Type 304, 0.016 in. Thick. (Preferred)
   2. Fabricate through-wall flashing with sealant stop unless otherwise indicated. Fabricate by bending metal back on itself 3/4 inch at exterior face of wall and down into joint 1/4 inch to form a stop for retaining sealant backer rod.
   3. Fabricate metal drip edges and sealant stops for ribbed metal flashing from plain metal flashing of same metal as ribbed flashing and extending at least 3 inches into wall with hemmed inner edge to receive ribbed flashing and form a hooked seam. Form hem on upper surface of metal so that completed seam sheds water.
   4. Fabricate metal drip edges from stainless steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
   5. Fabricate metal sealant stops from stainless steel. Extend at least 3 inches into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch and down into joint 1/4 inch to form a stop for retaining sealant backer rod.
   6. Fabricate metal expansion-joint strips from stainless steel to shapes indicated.
   7. Solder metal items at corners.

B. Application: Unless otherwise indicated, use the following:
   1. Where flashing is indicated to receive counterflashing, use metal flashing.
   2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
   3. Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing with a drip edge.
   4. Where flashing is fully concealed, use metal flashing.

C. Solder and Sealants for Sheet Metal Flashings: As specified in Section 07620 "Sheet Metal Flashing and Trim."

D. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

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2.09 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Pre-molded filler strips complying with ASTM D1056 Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene urethane or PVC.
B. Pre-formed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D2000, Designation M2AA-805 or PVC, complying with ASTM D2287 Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M Type I (No. 15 asphalt felt).

2.010 MASONRY-CELL FILL

A. Loose-Fill Insulation: Perlite complying with ASTM C549 Type II (surface treated for water repellency and limited moisture absorption) or Type IV (surface treated for water repellency and to limit dust generation).
B. Lightweight-Aggregate Fill: ASTM C331/C331M.

2.011 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
    1. Do not use calcium chloride in mortar or grout.
    2. Use portland cement-lime mortar unless otherwise indicated.
    3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
B. Pre-blended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a pre-blended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
    1. For masonry below grade or in contact with earth, use Type M.
    2. For reinforced masonry, use Type S.
C. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.
    1. Pigments shall not exceed 10 percent of portland cement by weight.
    2. Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.
    3. Mix to match Architect's sample.
    4. Application: Use pigmented mortar for exposed mortar joints with the following units:
        a. Decorative CMUs.
        b. Pre-faced CMUs.
        c. Cast-stone trim units.
D. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.
    1. Application: Use colored-aggregate mortar for exposed mortar joints with the following units:
        a. Decorative CMUs.
E. Grout for Unit Masonry: Comply with ASTM C476.
    1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with ASCE 6 for dimensions of grout spaces and pour height.
    2. Proportion grout in accordance with ASTM C476 Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
    3. Provide grout with a slump of 8 to 11 in. as measured according to ASTM C143/C143M.

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PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
   1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
   2. Verify that foundations are within tolerances specified.
   3. Verify that reinforcing dowels are properly placed.
   4. Verify that substrates are free of substances that would impair mortar bond.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION, GENERAL

A. Build chases and recesses to accommodate items specified in this and other Sections.

B. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.

C. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.03 TOLERANCES

A. Dimensions and Locations of Elements:

Location	Tolerance
Dimension in Cross-Sections, Elevations	+1/2 in. to -1/4 in.
Location of Elements in Plan View	+/- 1/2 in.
Location Elements in Elevation View	+/- 1/4 in. per story Or +/- 1/2 in.

B. Lines and Levels:

Line Type	Dimension	Tolerance
Bed Joint; Top Surface of Bearing walls	Level	1/4 in. per 10 ft. Or 1/2 in. maximum
Horizontal lines (Lintels, sills, parapets, reveals)	Level	1/8 in. per 10 ft. 1/4 in. per 20 ft. Or 1/2 in. maximum
Vertical Lines, Surfaces	Plumb	1/4 in. in 10 ft. 3/8 in. in 20 ft. Or 1/2 in. maximum
Conspicuous vertical lines (external corners, door jambs, reveals, expansion and control joints)	Plumb	1/8 in. in 10 ft. 1/4 in. in 20 ft. Or 1/2 in. maximum

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Vertical Alignment of Exposed Head Joints	Plumb	1/4 in. in 10 ft. Or 1/2 in. maximum
Faces of Adjacent Exposed Masonry Unit	Flush alignment	1/16 in.

C. Joints:

Joint Type	Dimension	Tolerance
Bed	Thickness	+/- 1/8 in.
Exposed Bed	Bed-Joint Thickness of adjacent courses	+/- 1/8 in.
Head and Collar	Thickness	+3/8 in. to -1/4 in.
Exposed Head	Thickness	+/- 1/8 in.

3.04 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

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C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 in. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4 in. horizontal face dimensions at corners or jambs.
D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
H. Fill cores in hollow CMU(s) with grout 24 in. under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
I. Build non-load bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.
    1. Install compressible filler in joint between top of partition and underside of structure above.
    2. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 07840 - Firestopping.

3.05 MORTAR BEDDING AND JOINTING

A. Lay hollow CMU(s) as follows:
    1. Bed face shells in mortar and make head joints of depth equal to bed joints.
    2. Bed webs in mortar in all courses of piers, columns, and pilasters.
    3. Bed webs in mortar in grouted masonry, including starting course on footings.
    4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
B. Lay solid CMU(s) with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
C. Set cast-stone trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.
    1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
    2. Wet joint surfaces thoroughly before applying mortar.
    3. Rake out mortar joints for pointing with sealant.
D. Rake out mortar joints at pre-faced CMU(s) to a uniform depth of 1/4 in. and point with epoxy mortar to comply with epoxy-mortar manufacturer's written instructions.
E. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
F. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.
G. Cut joints flush where indicated to receive waterproofing unless otherwise indicated.

3.06 MASONRY-CELL FILL

A. Pour loose-fill insulation into cavities to fill void spaces. Maintain inspection ports to show presence of fill at extremities of each pour area. Close the ports after filling has been confirmed. Limit the fall of fill to one story high, but not more than 20 ft.

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3.07 MASONRY-JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 in. on exterior side of walls, 1/2 in. elsewhere. Lap reinforcement a minimum of 6 in.
B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
C. Provide continuity at wall intersections by using prefabricated T-shaped units.
D. Provide continuity at corners by using prefabricated L-shaped units.

3.08 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:
   1. Provide an open space not less than 1/2 in. wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
   2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
   3. Space anchors as indicated, but not more than 24 in. o.c. vertically and 36 in. o.c. horizontally.

3.09 CONTROL AND EXPANSION JOINTS

A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
B. Form control joints in concrete masonry using one of the following methods:
   1. Fit bond-breaker strips into hollow contour in ends of CMU(s) on one side of control joint. Fill resultant core with grout, and rake out joints in exposed faces for application of sealant.
   2. Install preformed control-joint gaskets designed to fit standard sash block.
   3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar, or rake out joint for application of sealant.
   4. Install temporary foam-plastic filler in head joints, and remove filler when unit masonry is complete for application of sealant.

3.010 LINTELS

A. Provide masonry lintels where shown and where openings of more than 12 in. for brick-size units and 24 in. for block-size units are shown without structural steel or other supporting lintels.
B. Provide minimum bearing of 8 in. at each jamb unless otherwise indicated.

3.011 FLASHING

A. General: Install embedded flashing at ledges and other obstructions to downward flow of water in wall where indicated.
B. Install flashing as follows unless otherwise indicated:
   1. At lintels, extend flashing a minimum of 6 in. into masonry at each end. At heads and sills, extend flashing 6 in. at ends and turn up not less than 2 in. to form end dams.
   2. Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than 1-1/2 in. or as recommended by flashing manufacturer, and seal lap with elastomeric sealant.
   3. Install metal drip edges and sealant stops with ribbed sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant.
C. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.

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D. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

3.012 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
   1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
   2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
B. Placing Reinforcement: Comply with requirements in ASCE 6.
C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
   1. Comply with requirements in ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
   2. Limit height of vertical grout pours to not more than 60 in.

3.013 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
B. Inspections: Special inspections according to Level C in ASCE 5.
   1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
   2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
   3. Place grout only after inspectors have verified proportions of site-prepared grout.
C. Testing Prior to Construction: One set of tests.
D. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.
E. Prism Test: For each type of construction provided, according to ASTM C1314 at 7 days and at 28 days.

3.014 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
   1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.

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2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

3.015 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
B. Masonry Waste Recycling: Return broken CMU(s) not used as fill to manufacturer for recycling.
C. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION

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SECTION 05515 – ALUMINUM LADDERS AND ACCESSORIES

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers aluminum ladders and its accessories.

B. Contractor shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:

1.03 REFERENCES

A. Occupational Safety and Health Administration (OSHA)
   1. 1910.23 – Ladders
   2. 1926.1053 - Ladders

1.04 SUBMITTALS

A. Submit as specified in Section 01019 – Closeout Procedures.

B. Submit manufacturer's literature describing components to be provided, giving manufacturer's name, product component name, and line number for each component.

C. Technical Submittals Include, but not limited to the following:
   1. Catalog data
   2. General Arrangements
   3. Assembly and disassembly or repair instructions
   4. Fabrication Drawings
   5. Detail Drawings
   6. Installation Drawings
   7. Mounting Assembly Diagram
   8. Performance Data
   9. Instruction books and Operation and Maintenance manuals
   10. Spare parts lists

D. Quality Assurance Submittals
   1. Provide manufacturer's certification that products to be used comply with specified requirements and are suitable for intended application.

1.05 QUALITY ASSURANCE

A. Qualifications
   1. Equipment specified herein shall be the product of a reputable and qualified manufacturer who is of proven ability and has at least five (5) years of experience in the production of such equipment in sizes similar to those required on this project. The manufacturer shall have

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completed and made ready for operation at least twenty-five separate installations in the United States that have been in operation for at least five (5) years.

B. Sourcing – If more than one (1) ladder is procured via this section, ladders shall be provided from a single manufacturer.
C. Identification – Products must include a nameplate securely mounted to the equipment and for the motor/driver. At a minimum the nameplate must include the following.
    1. Manufacturer's name, product name, and number
    2. Order Number
    3. Serial Number
    4. Speed (Motors only)
    5. Certification Stamps (AWWA, ASME, FM, NEMA, UL, etc.)
D. Pre-production Conference
    1. Before any design and manufacturing Work commences, a pre-production conference must be held and attended by City's Representative, Engineer, and Manufacturer's Technical Representative.
    2. At a minimum, the following topics shall be addressed and discussed during the pre-production conference.
        a. Contract Documents
        b. Project Safety Plan
        c. Schedule of technical submittals
        d. Quality Control
        e. Delivery, Storage, and Handling
        f. Field Representative Services
E. Manufacturer's Service
    1. The Manufacturer's Technical Representative shall be available to provide on-site technical assistance during commissioning activities.

1.06 DELIVERY, STORAGE, AND HANDLING

A. All components and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment tools, and methods used in unloading, reloading, hauling, and shipping shall be such that components are not damaged.
B. For equipment exceeding 50 pounds, lifting eyes and lifting lugs shall be provided to allow for installation.
C. Boxes and packages shall be properly marked to show its net and total weight, contents within the box and/or package.
D. Items shall be marked as identified in delivery schedule and as shown in Submittals and include a complete list and bills of materials with each shipment. Each item requiring assembly shall be properly tagged and marked.
E. If items are shipped separately, they shall be tagged and indicated as such to facilitate proper assembly on-site.

1.07 WARRANTY

A. Equipment manufacturer shall provide a warranty for all items furnished in accordance with Section 01740. Warranty shall run concurrently with the Contractor's warranty and commence at final completion and CITY's acceptance.

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B. Warranty shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate equipment design, improper assembly or erection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the manufacturer.

PART 2 – PRODUCTS

2.01 Design

A. Type(s)
   1. Ladders less than 24 feet from floor shall be of the fixed type with a safety cage.
   2. Ladders greater than 24 feet from floor shall be of the fixed type with rail-type climbing ladder fall arrest system.

2.02 Components

A. Components listed below are additional requirements for ladder components. Any components not listed below shall meet all other requirements of this Section.
B. Side Rails
   1. Width: 1 3/4 in.
   2. Tubes
      a. Diameter: 3 in.
      b. Wall Thickness:
   3. Side rails shall be extended 42 in. above the roof line.
   4. Joining Method:
      a. To Floor: 2 in. x 1/4 in. flat bar floor brackets.
C. Rungs
   1. Width: 1 1/4 in.
   2. Diameter: 1 1/4 in.
   3. Length: 24 in.
   4. Live Load: 1000 lbs.
   5. Surface Finish: Serrated
   6. Spacing: 12 in. on center
   7. Clearance: 7 in. from wall to rung centerline
   8. Joining Method
      a. To Side Rails: Welded
      b. To Wall: 2 in. x 1/4 in. flat bar wall brackets.
D. Safety Cages
   1. Fabricated using 2 in. x 1/4 in. thick aluminum vertical strips and horizontal loops welded to form a cage around the ladder.
   2. Clearance (From back of cage to ladder): 27 in.
   3. Vertical Strips
      a. Qty. 7 equally spaced around perimeter of cage
   4. Horizontal loops
      a. Maximum Spacing: 48 in.
      b. Bottom loop radius shall be 17 1/2 in. Radius of other loops shall be 13 1/2 in.
   5. Bottom loop/Cage Start shall be 8 ft. above floor level/grade.
   6. Roofover Rail extensions
      a. Side rails and Safety Cages shall extend 42 in. minimum above the top rung. Extensions must be attached to side rails.

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b. Extensions are not required when ladder is servicing a roof access hatch or it located underneath a floor plate.

E. Safety Post Extension
   1. Function(s):
      a. Safety Post Extension shall service personnel entering/exiting roof access hatches and in locations whereas ladders are located underneath floor plates.
      b. Safety Post Extensions shall not be used when ladder has side rail and safety cage extensions.
   2. Feature(s): Operating instructions shall be mounted in a manner it is plainly visible to ladder users.
   3. Fabricated of tubular aluminum sections with adjustable mounting brackets for attachment to top of ladder.
F. Security Door
   1. Function(s):
      a. Security door shall be used to cover bottom rungs and prevent unauthorized roof access from grade or floor level.
      b. Security door shall not be used when ladder provides access to lower levels and ladder does not provide roof access.
   2. Feature(s):
      a. Security door shall include side flanges extending toward wall and meet a wall-mounted flange.
      b. Security door shall include continuous hinge and padlock hasp
   3. Fabricated using 11 gage flat aluminum sheet covering front of ladder.
G. Fall Prevention Systems
   1. Type(s) – Fall prevention system shall be of the rail-type climbing ladder fall arrest system (CLFAS)
   2. Function(s): Fall prevention system shall service any ladder whose length is larger than 24 ft.
   3. Feature(s): CLFAS must include railing, brackets, clamps, 2 sleeves, 2 belts and adhere to all OSHA requirements.
   4. Acceptable Manufacturers
      a. North Consumer Products, Saf-T-Climb
      b. Swagger Communications, Climbers Buddy System

2.03 Materials of Construction (MOC)
A. For general requirements for Materials of Construction, refer to the Blue River Screen House Basis of Design Report.
B. Tube: Non-spark Extruded ASTM B221, Alloy 6063 Temper T-6
C. Sheet: ASTM B209 Alloy 6063 Temper T-6
D. Finish: Mill

2.04 Acceptable Manufacturers
A. UPNOVR, Inc. (ACL Industries, Inc.)
B. Precision Ladders, LLC.
C. O'Keefe's Inc.
D. Or Equal

TEMPLATE

PART 3 – EXECUTION (NOT USED)

END OF SECTION

TEMPLATE

SECTION 05522 – ALUMINUM HANDRAILS, GUARDRAILS, AND SAFETY GATES

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers aluminum handrails, guardrails, safety gates, and their accessories.

B. Contractor shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:
   1. Section 01019 – Closeout Procedures
   2. Section 01740 - Warranty

1.03 REFERENCES

A. Aluminum Association (AA)
   1. M12-C22-A41 –Non-specular as fabricated mechanical finish, medium-matte chemical finish, Clear anodic coating

B. American Society of Testing and Materials (ASTM)
   1. A193 – Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
   2. B209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
   3. B221 – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
   4. B429 – Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube

C. Occupational Safety and Health Administration (OSHA)
   1. 1910.29 – Fall protection systems and Falling Object Protection-Criteria and Practices

1.04 SUBMITTALS

A. Submit as specified in Section 01019 – Closeout Procedures.

B. Submit manufacturer's literature describing components to be provided, giving manufacturer's name, product component name, and line number for each component.

C. Technical Submittals Include, but not limited to the following:
   1. Catalog data
   2. Equipment P&IDs
   3. General Arrangements
   4. Assembly and disassembly or repair instructions
   5. Fabrication Drawings
   6. Detail Drawings
   7. Single Line Diagram
   8. Schematic and Wiring Diagrams
   9. Installation Drawings

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10. Mounting Assembly Diagram
11. Performance Data
12. Instruction books and Operation and Maintenance manuals
13. Spare parts lists

D. Quality Assurance Submittals
   1. Provide manufacturer's certification that products to be used comply with specified requirements and are suitable for intended application.

1.05 QUALITY ASSURANCE

A. Qualifications
   1. Equipment specified herein shall be the product of a reputable and qualified manufacturer who is of proven ability and has at least five (5) years of experience in the production of such equipment in sizes similar to those required on this project. The manufacturer shall have completed and made ready for operation at least twenty-five separate installations in the United States that have been in operation for at least five (5) years.

B. Sourcing – If more than one (1) item is procured via this section, all items provided shall be provided from a single manufacturer.

C. Pre-production Conference
   1. Before any design and manufacturing Work commences, a pre-production conference must be held and attended by City's Representative, Engineer, and Manufacturer's Technical Representative.
   2. At a minimum, the following topics shall be addressed and discussed during the pre-production conference.
      a. Contract Documents
      b. Project Safety Plan
      c. Schedule of technical submittals
      d. Quality Control
      e. Delivery, Storage, and Handling
      f. Field Representative Services

D. Manufacturer's Service
   1. The Manufacturer's Technical Representative shall be available to provide on-site technical assistance during commissioning activities.

1.06 DELIVERY, STORAGE, AND HANDLING

A. All components and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment tools, and methods used in unloading, reloading, hauling, and shipping shall be such that components are not damaged.

B. For equipment exceeding 50 pounds, lifting eyes and lifting lugs shall be provided to allow for installation.

C. Boxes and packages shall be properly marked to show its net and total weight, contents within the box and/or package.

D. Items shall be marked as identified in delivery schedule and as shown in Submittals and include a complete list and bills of materials with each shipment. Each item requiring assembly shall be properly tagged and marked.

E. If items are shipped separately, they shall be tagged and indicated as such to facilitate proper assembly on-site.

TEMPLATES

1.07 WARRANTY

A. Equipment manufacturer shall provide a warranty for all items furnished in accordance with Section 01740. Warranty shall run concurrently with the Contractor's warranty and commence at final completion and CITY's acceptance.

B. Warranty shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate equipment design, improper assembly or erection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the manufacturer.

PART 2 – PRODUCTS

2.01 Design

A. Type – Aluminum Handrails and Guardrails shall be of the non-welded pipe type.

B. Fabrication

1. Rails, posts, and fitting-assembly spacers shall be fabricated from extruded aluminum pipe.
2. Posts shall be fabricated in single, unspliced pipe length.
3. Parts shall not be epoxy-bonded.
4. Pre-treat aluminum for cleaning and removing markings before anodizing
5. Anodized finish shall be applied to exposed surfaces after all cutting operations have been completed.
6. Perform fabrication without welding.

2.02 Components

A. Components listed below are additional requirements for rail components. Any components not listed below shall meet all other requirements of this Section.

B. Aluminum Pipe Stock

1. Outside Diameter: 1.90 in.
2. Schedule: 40 (0.145 in. WT)

2.03 Materials of Construction (MOC)

A. For general requirements for Materials of Construction, refer to the Blue River Screen House Basis of Design Report.

B. Acceptable Materials

Parameter	Value	Unit
Rails, Posts, Fitting-Assembly Spacer	ASTM B429 Alloy 6005	-
Rails, Posts, Fitting-Assembly Spacer	ASTM B429 Alloy 6063	-
Rails, Posts, Fitting-Assembly Spacer	ASTM B429 Alloy 6105	-
Bases	ASTM B221 Alloy 6061-T6	-
Bases	ASTM B221 Alloy 6063-T6	-
Kick Plates	ASTM B209 Alloy 6061	-
Kick Plates	ASTM B209 Alloy 6105	-
Plug Screws and Blind Rivets	ASTM A193 Grade B8M	

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Other Parts	ASTM B221 Alloy 6063-F214	-
Other Parts	ASTM B221 Alloy 6063-F514.0	-

C. Finish:
   1. Aluminum Association M12-C22-A41 –Non-specular as fabricated mechanical finish, medium-matte chemical finish, Clear anodic coating
      a. Anodic Coating – 0.7 mil thick

2.04 Acceptable Manufacturers
A. Moultrie Manufacturing Co., Wesrail
B. Golden Railings, Riveted System
C. Craneveyor Corp. Enerco Metals, C-V Rail.
D. Or Equal

PART 3 – EXECUTION (NOT USED)

END OF SECTION

TEMPLATES

SECTION 05542 – ALUMINUM FLOOR PLATES

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers aluminum floor plates and their accessories.

B. Contractor shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:
   1. Section 01019 – Closeout Procedures
   2. Section 01740 – Warranty
   3. Section 01810 – Project Design Criteria
   4. Section 02490 – Foundation Anchors

1.03 REFERENCES

A. Aluminum Association (AA)
   1. Specification for Aluminum Structures
B. American Concrete Institute (ACI):
   1. 355.2 – Qualification of Post-Installed Mechanical Anchors in Concrete & Commentary
C. American National Standards Institute (ANSI):
   1. B212.15 – Cutting Tools – Carbide-tipped Masonry Drills and Blanks for Carbide-tipped Masonry Drills.
D. American Society of Testing and Materials (ASTM)
   1. A193 – Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
   2. A276 – Standard Specification for Stainless Steel Bars and Shapes
   3. B209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
   4. B221 – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
E. Occupational Safety and Health Administration (OSHA)
   1. 1910.23 – Guarding Floor and wall openings and holes
   2. 1910.29 – Fall protection systems and Falling Object Protection-Criteria and Practices

1.04 DEFINITIONS

A. ICBO – International Conference of Building Officials

1.05 SUBMITTALS

A. Submit as specified in Section 01019 – Closeout Procedures.

B. Submit manufacturer's literature describing components to be provided, giving manufacturer's name, product component name, and line number for each component.

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C. Technical Submittals Include, but not limited to the following:
   1. Catalog data
   2. Equipment P&IDs
   3. General Arrangements
   4. Assembly and disassembly or repair instructions
   5. Fabrication Drawings
   6. Detail Drawings
   7. Single Line Diagram
   8. Schematic and Wiring Diagrams
   9. Installation Drawings
   10. Mounting Assembly Diagram
   11. Performance Data
   12. Instruction books and Operation and Maintenance manuals
   13. Spare parts lists

D. Quality Assurance Submittals
   1. Provide manufacturer's certification that products to be used comply with specified requirements and are suitable for intended application.

1.06 QUALITY ASSURANCE

A. Qualifications
   1. Equipment specified herein shall be the product of a reputable and qualified manufacturer who is of proven ability and has at least five (5) years of experience in the production of such equipment in sizes similar to those required on this project. The manufacturer shall have completed and made ready for operation at least twenty-five separate installations in the United States that have been in operation for at least five (5) years.
   2. Manufacturer shall be listed by recognized building code authority including the International conference of Building Officials.
B. Sourcing – If more than one (1) floor plate is procured via this section, all floor plates shall be provided from a single manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

A. All components and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment tools, and methods used in unloading, reloading, hauling, and shipping shall be such that components are not damaged.
B. For equipment exceeding 50 pounds, lifting eyes and lifting lugs shall be provided to allow for installation.
C. Boxes and packages shall be properly marked to show its net and total weight, contents within the box and/or package.
D. Items shall be marked as identified in delivery schedule and as shown in Submittals and include a complete list and bills of materials with each shipment. Each item requiring assembly shall be properly tagged and marked.
E. If items are shipped separately, they shall be tagged and indicated as such to facilitate proper assembly on-site.

1.08 WARRANTY

TEMPLATES

A. Equipment manufacturer shall provide a warranty for all items furnished in accordance with Section 01740. Warranty shall run concurrently with the Contractor's warranty and commence at final completion and CITY's acceptance.
B. Warranty shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate equipment design, improper assembly or erection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the manufacturer.
C. Exterior faces and laminate adhesives shall be warranted for a minimum of 25 years against fiber exposures or defective applications

PART 2 – PRODUCTS

2.01 DESIGN

A. Type
   1. Flush Floor Hatch.
B. Functions
   1. Access Hatches will serve as a replacement to existing steel floor plates. Existing steel floor plates were used for access to a HVAC air inlets and outlets. Replacement floor plates will be used for visual inspection.
C. Features
   1. Hatch shall include a recessed handle below the operating floor elevation.
   2. Plate shall include a diamond-plated pattern.
D. Site Conditions
   1. Floor Plate shall meet all site design requirements as specified by Section 01810 – Project Design Criteria.
   2. Floor plate shall meet all OSHA requirements for floor openings.
E. Operating Conditions
   1. Size:
      a. Width x Length: 36 in. x 36 in.
      b. Thickness: 1/4 in.
   2. Live Load: Minimum 100 lb/sq.ft. + 1000 lb of concentrated load.
   3. Deflection: L/240
      a. If Width and Length are different values, L shall be considered the smaller value between Width and Length.
   4. Position: Locked Closed

2.02 COMPONENTS

A. Components listed below are additional requirements for rail components. Any components not listed below shall meet all other requirements of this Section.
B. Floor Hatch
   1. Designed in accordance with AA - Specifications for Aluminum Structures and project design criteria.
   2. If there is an existing floor hatch and/or floor plate, it shall be removed in its entirety and replaced with new aluminum hatch. Mechanical Anchors must be deemed sufficient for reuse, qualified per ACI 355.2 and must be stainless steel material. If anchors are not stainless steel, wall anchors shall be removed and replaced per Section 02490 – Foundation Anchors

TEMPLATES

2.03 MATERIALS OF CONSTRUCTION (MOC)

A. For general requirements for Materials of Construction, refer to the Blue River Screen House Basis of Design Report.

B. Materials

1. Frame

a. Acceptable Materials

Parameter	Value	Unit
Frame	ASTM B209 Alloy 6061-T6	-
Beams	ASTM B221 Alloy 6063-T6	-
Fasteners	ASTM A193 Grade B8M	-

2. Plate

a. Acceptable Materials

Parameter	Value	Unit
Plate	ASTM B209 Alloy 6061-T6	-
Hinges	ASTM A276 – 304SS	-
Handle	ASTM A276 – 304SS	-

3. Colors

a. Only if specified by CITY.

2.04 APPROVED MANUFACTURERS

A. Light Duty

1. Bilco Co. Model: K or KD
2. Babcock Davis Associates, Inc. Model BFDNA-SAL or BFDNA-DAL
3. Or Equal

B. Medium Duty

1. Bilco Co. Model J or JD
2. Babcock Davis Associates, Inc. Model BFDDP-SAL or BFDDP-DAL
3. Or Equal

C. Heavy Duty

1. Bilco Co. Model: JH-20 or JDH-20
2. Babcock Davis Associates, Inc. Model BFDDH-SAL or BFDDH-DAL
3. Or Equal

PART 3 – EXECUTION (NOT USED)

END OF SECTION

TEMPLATES

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SECTION 07100 – DAMPPROOFING AND WATERPROOFING

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers dampproofing and waterproofing for vaults, mezzanines, basements, tunnels, wet wells, and manhole structures.

B. Contractor shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:
   1. Section 01019 – Closeout Procedures
   2. Section 01740 – Warranty
   3. Section 01810 – Project Design Criteria
   4. Section 02490 – Foundation Anchors

1.03 REFERENCES

A. American Concrete Institute (ACI)
   1. 344R-T – Design and Construction of Circular Pre-stressed Concrete Structures with Circumferential Tendons
   2. 344R-W – Design and Construction of Circular Wire and Strand Wrapped Pre-stressed Concrete Structures
   3. 350R-01- Code Requirements for Environmental Engineering Concrete Structures
   4. 350.1 – Testing of Reinforced Concrete Structures for Water Tightness
   5. 350.2 – Concrete Structures for Containment of Hazardous Material
   6. 503 – Use of Epoxy Compounds with Concrete
   7. 503 R-90 – Guide to Sealing Joints in Concrete Structures

B. American Society for Testing and Materials (ASTM)
   1. D01.23 – Test Method for Nondestructive Measurement of Dry Film Thickness of Applied Organic Coatings Using an Ultrasonic Gauge
   2. D16 – Terminology Relating to Paint, Varnish, Lacquer, and Related Products
   3. D1005 – Test for determining dry film thickness
   4. D3359 – Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
   5. D4258 – Practice for Surface Cleaning Concrete for Coating
   6. D4259 – Practice for Abrading Concrete
   7. D4262 – Test Method for pH of Chemically Cleaned or Etched Concrete Surfaces
   8. D4414 – Standard Practice for Measurement of Wet Film Thickness by Notch Gauges
   9. D4541 – Test Method for Pull Off Strength of Coatings Using Portable Adhesion-Testers
   10. D4787 – Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates
   11. D5162 – Standard Practice for Discontinuity (Holiday) Testing of Nonconductive Protective Coating on Metallic Substrates
   12. D6677 – Standard Test Method for Evaluating Adhesion by Knife

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13. E337 – Test Method for Measuring Humidity with a Psychrometer

C. International Concrete Repair Institute (ICRI)
   1. Guideline No. 03732 – Guide to Surface Preparation of Concrete to Receive Sealers, Coatings, and Polymer Overlays

D. National Association of Corrosion Engineer (NACE)
   1. RP 6F-166 – Recommended Practice for Inspection of Linings on Steel and Concrete

E. Society for Protective Coatings (SSPC)
   1. PA1 – Painting Application Specification
   2. PA2 – Measurement of Dry Paint Thickness with Magnetic Gages
   3. SP1 –Solvent Cleaning
   4. SP2 – Hand Tool Cleaning
   5. SP3 – Power Tool Cleaning
   6. SP10 – Near White Metal Blast Cleaning
   7. SP12 – Surface Preparation and Cleaning of Steel and Other Hard Materials by High- and Ultra High- Pressure Water Jetting Prior to Recoating
   8. SP13 – Surface Preparation of Concrete
   9. TU 2 – Design, Installation, and Maintenance of Coating Systems for Concrete Used in Secondary Containment

1.04 DEFINITIONS

A. ICBO – International Conference of Building Officials

1.05 SUBMITTALS

A. Submit as specified in Section 01019 – Closeout Procedures.

B. Submit manufacturer's literature describing components to be provided, giving manufacturer's name, product component name, and line number for each component.

C. Technical Submittals Include, but not limited to the following:
   1. Catalog data
   2. General Arrangements
   3. Assembly and disassembly or repair instructions
   4. Performance Data
   5. Instruction books
   6. Spare parts lists

D. Quality Assurance Submittals
   1. Provide manufacturer's certification that products to be used comply with specified requirements and are suitable for intended application.

1.06 QUALITY ASSURANCE

A. Qualifications
   1. Provide products from a company specializing in manufacture of coatings with a minimum of 10 years of experience.
   2. Applicator shall be trained in application techniques and procedures of coating materials and shall demonstrate a minimum of 5 years successful experience in such application.

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Throughout application, Contractor shall maintain a crew who are fully qualified persons, competent persons and have previously applied coating systems listed herein.

B. Sourcing
   1. All coating materials shall be products from a single manufacturer.
   2. Secondary materials recommended by coating system manufacturer shall be provided for proper installation of coating.
C. Identification – Painting and coating materials shall be readily identified by labeling on the container. At a minimum, the label must include the following:
   1. Manufacturer's name, product name, and number.
   2. Type of paint and generic name.
   3. Color name and number.
   4. Storage and temperature limits.
   5. Mixing and application instructions, including requirements for precautions to be taken
   6. Drying, recoat, or curing time.
D. Manufacturer's Service
   1. The Manufacturer's Technical Representative shall be available to provide on-site technical assistance, and guidance for application of the paint system as needed.
E. Inspections
   1. Cleaning operations to surfaces are to condition specified
   2. Conformance of paint to product specification
   3. Check DFT thickness
   4. Test for holidays
   5. Inspect touch-up finish
   6. Contractor shall provide wet and dry film gauges for use by Inspector
      Written Progress reports

1.07 WARRANTY

A. Equipment manufacturer shall provide a warranty for all items furnished in accordance with Section 01740. Warranty shall run concurrently with the Contractor's warranty and commence at final completion and CITY's acceptance.
B. Warranty shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate equipment design, improper assembly or erection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the manufacturer.

PART 2 – PRODUCTS

2.01 Design

A. Application
   1. Exterior wall surfaces of cast-in-place and precast concrete structures below finished grade and above the top of footings or bottom slabs.
   2. In areas where exterior surfaces can not be exposed and dampproofing is required, membranes may be considered acceptable for use by CITY.
   3. For internal wall coatings, refer to Section 09961 – Concrete Coatings.
      a. Internal wall surfaces of Wet wells, channels, mezzanines or other areas with open surfaces of sewer inflow do not require dampproofing membranes.

2.02 ACCEPTABLE MANUFACTURERS

A. Coal Tar Epoxy

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1. Ameron Amercoat 78HB Coal Tar Epoxy
2. Carboline Bitumastic 300M
3. Tnemec 46H-413 Hi-Build Tneme-Tar
4. Sherwin-Williams Hi-Mil Sher-Tar Epoxy

B. Dry Film Thickness
1. Minimum number of coat application
2. Total: 20 mils DFT

2.03 SUBSTITUTITONS

A. Materials specified herein shall not preclude consideration of equivalent materials. Equivalent materials shall be submitted to Engineer for consideration and shall be made at least ten (10) business days prior to the date of bids. Refer to Section 01630 – Substitution Request.
1. Requests for substitution shall include evidence of satisfactory past performance.
2. Substitutions will not be considered that change number of coats or do not meet specified total dry film thickness.
3. Contractor shall state in the bid the amount of deduct to use equivalent materials to those specified.
4. Substitutions of equal materials must induce individual products performance test data for comparison to the specified products performance test data.

B. Substitutions of equal materials must include the individual product performance test data for comparison to the performance test data of specified products herein.

2.04 ACCESSORIES

A. Application accessories shall be used as indicated in coating manufacturer's application instructions, including but not limited to cleaning agents, etching agents, cleaning cloths, sanding materials, and clean-up materials.

B. Materials need for proper application, but not specifically identified shall be of a quality not less than specified products.

2.05 APPROVED MANUFACTURERS

A. Dampppproofing
1. Ameron; Model: Amercoat 78HB Coal Tar Epoxy
2. Carboline; Model: Bitumastic 300M
3. Tnemec; Model: 46H-413 Hi-Build Tneme-Tar
4. Sherwin-Williams; Model: Hi-Mil Sher-Tar Epoxy
5. Or Equal

B. Concrete Sealer
1. Euclid Chemical Co.; Model: Diamond Hard
2. L&M Construction Chemicals; Model: SealHard
3. Or Equal

C. Surface Sealant System
1. Euclid Chemcial Co.; Model: Vandex Super
2. Kryton Internation, Inc.; Model Krystol T1
3. Xypex Chemical Corp.; Model: Xypex Concentrate
4. Or Equal

PART 3 – EXECUTION

3.01 SITE CONDITIONS

A. Contractor shall field verify necessary volumes, areas, dimensions, and quantities required to complete Work.

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B. Work area shall be examined for conditions under which application of coating systems shall be performed for conditions that will adversely affect execution, permanence, or quality of coating system application. Any conditions identified as detrimental and unsatisfactory for Work under this Section shall be corrected prior to commencement of coating application. Any commencement of installation constitutes an acceptance of conditions and responsibility for satisfactory performance by Contractor.
C. Contractor shall maintain a clean site. Refuse, solid waste, hazardous waste, toxic waste, or trash from consumables shall be properly disposed of in designated containers. Paints and solvents shall not be disposed of by pouring on the ground. Solvent-soaked rags and oil soaked rags shall be returned for contaminant recovery and laundering.
D. Any items or flammable objects no longer in use shall be properly removed and/or disposed of as to prevent fire hazards and spontaneous combustion.
E. Any items considered Household Hazardous Waste may be taken to the Household Hazardous Waste facility located at 4707B Deramus Ave, Kansas City, MO 64120. Accepted Household Hazardous Waste items are as follows:
    1. Antifreeze
    2. Fuels
    3. Hazardous Cleaners
    4. Hazardous Liquids
    5. Household Cleaners
    6. Paint
    7. Solvents
    8. Thinners
    9. Used Oils

    Refer to kcwater.us/programs/hhw for the full list of acceptable items that may be dropped off and the hours of operation.

F. Contractor shall be responsible for costs associated with containment and waste disposal that may result from execution of this Project.

3.02 EXAMINATION

A. Examine areas and conditions under dampproofing application shall be performed for conditions that will adversely affect execution, permanence, or quality of coating system application.
B. Air intakes, returns, or other air breathing equipment which may pull air near fresh coatings shall be covered.
C. Storage area shall be clean and neat at all times.

3.03 CONCRETE REPAIR/RESTORATION

A. Opaque concrete sealer system shall consist of one or more systems for protection of concrete or masonry surfaces.
    1. Repair of Bug Holes & Honeycombs – Designated areas of concrete surfaces shall receive application as required to fill all voids and surfaces are restored to original as-built surface plane. Fins and protrusions shall be removed by grinding or other suitable means.
    2. Crack and Joint Details – Exposed cracks, construction joints, contraction joints, and isolation joints shall be prepared and detailed in accordance with manufacturer's recommendations. Should any non-anticipated conditions or joint design arise, Contractor shall notify CITY and

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consult with material manufacturer for recommendations. Sealants must be fully cured prior to application of concrete primers.

3. Carbon Steel Rebar - Exposed carbon steel rebar shall be abrasive blasted in accordance with SSPC SP10. All exposed carbon steel rebar surfaces shall receive an epoxy coating. Any non-exposed carbon-steel rebar requires no additional coatings.

3.04 SURFACE PREPARATION

A. New Concrete has cured at least 28 days before dampproofing materials has been applied.
B. Existing coatings must be removed. Existing curing and sealing compounds shall be removed per ASTM D4259.
C. Guideline No. 03732, Guide to Surface Preparation of Concrete to Receive Sealers, Coatings, and Polymer Overlays shall be used to visually evaluate the concrete surface profile.
D. All concrete surfaces must be cured and dry. Inspect concrete surface for soundness, flatness, levelness and overall condition. Report any discrepancies to City's representative.
E. Surfaces to be prepared in accordance with SSPC-SP13. Vapor Abrasive Blasting equipment shall be used to minimize the amount of water and abrasive needing to be contained from water flow below.
F. Surface profile for the dampproofing materials shall be created and adhere to the following profile numbers in accordance with methods described in Guideline No. 03732
    1. Thin film to 10 mils CSP-1 to CSP-3
    2. 10 mils – 40 mils CSP-3 to CSP-5
    3. Mortars and Fillers to 3/16" CSP-4 to CSP-6
    4. Mortars and Fillers 3/16" – ¼" CSP-5 to CSP-9

3.05 APPLICATION

A. Coatings shall be applied and cured within the air and surface temperature ranges, and relative humidity ranges in accordance with manufacturer's instructions.
B. Surfaces shall not be prepared or coatings applied in rain, snow, fog, or mist.
C. Dampproofing materials shall not be thinned unless recommended by manufacturers.
D. Surfaces not intended to be dampproofed shall be protected from contamination, discoloration, or other damage. Such surfaces shall be adequately covered to limit dampproofing to the intended area.
E. Coating work shall be scheduled to avoid excessive dust and airborne contaminants. During coating application and curing, work areas shall be protected from excessive dust and airborne contaminants.
F. Dampproofing shall be applied by brush, high pile rollers, or spray requirements.
G. If in confined or enclosed areas, ventilation shall be provided during coating evaporation stage.
H. Application equipment shall be suitable for use and found in clean, properly adjusted for application, and recommended application type by manufacturer.
I. Coating system shall be applied per manufacturer's instructions including, but not limited to:
    1. Coating Application Equipment
    2. Full, uniform coverage
    3. Wet & Dry Film Thicknesses
    4. Minimum number of coats
    5. Re-coat times
    6. Application and curing conditions
    7. Product Thinning Requirements.

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3.06 COMMISSIONING

A. Dampproofing shall be inspected prior to commissioning. During inspection, CITY's representative, engineer, and painting contractor. Any deficiencies in the dampproofing will be repaired at the Contractor's expense.
   1. When blistering occurs, all blisters larger than ¼ in. in diameter shall be broken and dampproofing shall be reapplied.
B. In the event materials have spilled, dripped or splattered, it will be removed from the unintended surfaces accordingly. Contractor will be responsible for all cleanup and damage to any property due to coating.
C. After commissioning is completed, CITY shall set a date for a one-year inspection. Inspection will be attended by a CITY's representative, engineer, and painting contractor. Any deficiencies in the coatings system will be repaired at the Contractor's expense.

END OF SECTION

TEMPLATE

SECTION 07920 – JOINT SEALANTS

PART 1 – GENERAL

1.1 SUMMARY

A. This section covers joint sealants for Wastewater facilities.

B. Contractor shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.2 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:

1.3 REFERENCES

A. American Society of Testing and Materials (ASTM)
   1. C794 – Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
   2. C834 – Standard Specification for Latex Sealants
   3. C920 – Standard Specification for Elastomeric Joint Sealants
   4. C1087 – Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems
   5. C1193 – Standard Guide for Use of Joint Sealants.
   6. C1248 – Standard Test Method for Staining of Porous Substrate by Joint Sealants
   7. C1311 – Standard Specification for Solvent Release Sealants
   8. C1330 – Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants
   9. C1521 – Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints

1.4 SUBMITTALS

A. Submit as specified in Section 01019 – Closeout Procedures.

B. Submit manufacturer's literature describing components to be provided, giving manufacturer's name, product component name, and line number for each component.

C. Technical Submittals Include, but not limited to the following:
   1. Catalog data
   2. Equipment P&IDs
   3. General Arrangements
   4. Assembly and disassembly or repair instructions
   5. Fabrication Drawings
   6. Detail Drawings
   7. Single Line Diagram
   8. Schematic and Wiring Diagrams
   9. Installation Drawings
   10. Mounting Assembly Diagram

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11. Performance Data
12. Instruction books and Operation and Maintenance manuals
13. Spare parts lists

D. Quality Assurance Submittals
   1. Provide manufacturer's certification that products to be used comply with specified requirements and are suitable for intended application.

1.5 QUALITY ASSURANCE

A. Qualifications
   1. Materials specified herein shall be the product of a reputable and qualified manufacturer who is of proven ability and has at least five (5) years of experience in the production of such equipment in sizes similar to those required on this project.
   2. Installer shall be an authorized representative trained and approved.

B. Inspections and Testing
   1. Adhesion Testing shall be performed on field samples per ASTM C794
   2. Compatibility testing shall be performed on field samples per ASTM C1087
   3. Stain testing shall be performed on field samples per ASTM C1248.
   4. Testing of samples shall be incorporated into project schedule.
      a. Testing will not be required if sealant manufacturer provides data based on testing not older than 24 months of sealant products for adhesion to and compatibility with joint substrates and other materials used in this application.
   5. Joint sealants shall be tested and qualified per ASTM C1021.

C. Preconstruction Testing
   1. Locate and conduct a field test for each kind of sealant and joint substrate
   2. Provide 7 calendar day notice to CITY's representative when test joints will be erected.
   3. Arrange for joint sealant manufacturer's technical representative to be present during test
   4. Provide a report if the test passed, or failed. If failed, identify the likely cause of failure.
   5. For tests with passing adhesives, sealant shall be considered satisfactory.

1.6 DELIVERY, STORAGE, AND HANDLING

A. All components and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment tools, and methods used in unloading, reloading, hauling, and shipping shall be such that components are not damaged.

B. For materials exceeding 50 pounds, lifting eyes and lifting lugs shall be provided to allow for installation.

C. Boxes and packages shall be properly marked to show its net and total weight, contents within the box and/or package.

D. Items shall be marked as identified in delivery schedule and as shown in Submittals and include a complete list and bills of materials with each shipment. Each item requiring assembly shall be properly tagged and marked.

E. If items are shipped separately, they shall be tagged and indicated as such to facilitate proper assembly on-site.

1.7 WARRANTY

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A. Installer shall provide a warranty for all items furnished and installed in accordance with Section 01740. Warranty shall run concurrently with the Contractor's warranty and commence at final completion and CITY's acceptance.
B. Warranty shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate material selection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the installer.

PART 2 – PRODUCTS

2.1 General

A. All Joint Sealants, backings, and other related materials that are compatible with one another and joint substrates under conditions of service and application shall be provided.
B. All non-traffic exterior joints shall utilize a mildew resistant sealant and shall be suitable for a hydrogen sulfide atmosphere.
C. Backings shall be compatible with joint substrates, sealants, primers, and other joint fillers.
D. Bond-Breaker tape or other Manufacturer-recommended plastic tape shall be used for preventing adhesion to rigid-inflexible joint fillers or joint surfaces at back of joint.

Bond Breaker	Fixed / Indicative / Preferred Indicative
Self-adhesive Tape	Fixed

E. Non-staining joint sealants shall incur no staining of substrates in accordance with ASTM C1248.
F. Mildew resistant Joint sealants shall be formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
G. Butyl-rubber-based joint sealants shall adhere to requirements of ASTM C1311.

2.2 Acceptable Sealant Materials

A. Urethane
B. Silicone
C. STPE (Silyl Terminated Polyether) - Silicone / Polyurethane Blend

2.3 Sealant Classification

A. Sealants are classified as prescribed in ASTM C920.
B. Type
   1. M – Multicomponent sealant
   2. S – Single component sealant
C. Grade
   1. NS – Non-sag (also known as gunnable) sealant
   2. P – Pourable (or self-leveling) sealant
D. Classes
   1. 12 ½ - Sealant when tested for adhesion and cohesion under cyclic movement (8.8) shall withstand an increase and decrease of at least *12.5%* of the joint width as measured at time of application.
   2. 25 – Sealant when tested for adhesion and cohesion under cyclic movement (8.8) shall withstand an increase and decrease of at least *25%* of the joint width as measured at time of application.

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3. 50 - Sealant when tested for adhesion and cohesion under cyclic movement (8.8) shall withstand an increase and decrease of at least *50%* of the joint width as measured at time of application.

E. Uses
1. NT – Sealant suitable for Non-traffic area (vehicle traffic, pedestrian traffic)
2. T – Sealant suitable for Traffic areas (vehicle traffic, pedestrian traffic)
3. G – Sealant suitable for glass applications
4. A – Sealant suitable for Aluminum applications

2.4 Sealant Selection

A. Application Location Areas
1. Exterior Joints in Horizontal Traffic Areas
   a. Isolation and contraction joints in cast-in-place concrete slabs.
   b. Expansion joints
   c. Joints between different materials listed herein
2. Exterior Joints in vertical surfaces and horizontal nontraffic areas
   a. Construction joints in cast-in-place concrete
   b. Control and expansion joints in unit masonry
   c. Joints in exterior insulation and finish systems
   d. Joints between metal panels
   e. Joints between different materials listed above
   f. Perimeter joints between materials listed above and frames of doors, windows, and louvers
   g. Control and expansion joints in ceilings and other overhead surfaces.
3. Interior Joints in Horizontal traffic surfaces
   a. Isolation joints in cast-in-place concrete slabs
4. Interior joints in vertical surfaces and horizontal nontraffic surfaces
   a. Control and expansion joints on exposed interior surfaces of exterior walls
   b. Expansion joints
   c. Vertical joints on exposed surfaces of unit masonry, concrete walls and partitions.

B. Sealant Application Schedule
1. Sealants selected for applications shall be identified in the following manner
   a. Material, Type, Grade, Class, Uses

	Horizontal Traffic Areas	Fixed / Indicative / Preferred Indicative
Exterior Joints	Urethane, M, P, 50, T	Fixed
Interior Joints	Urethane, S, P, 25, T	Fixed

	Vertical Areas	Fixed / Indicative / Preferred Indicative
Exterior Joints	Silicone, Non-staining, S, NS, 50, NT	Fixed
Interior Joints	Urethane S, NS, 25, NT	Fixed

C. Joint sealant color shall be selected by Owner from manufacturer's full color catalog.

2.5 Backing Classification

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A. Backings are classified as prescribed in ASTM C1330.
B. Type
    1. C – Closed Cell cylindrical sealing backing
    2. O – Open Cell cylindrical sealing backing
    3. B – Bi-Cellular cylindrical sealing backing

2.6 ACCESSORIES

A. Application accessories shall be used as indicated in coating manufacturer's application instructions, including but not limited to primers, cleaning agents, and masking tape, and tooling agents
    1. Primer – Sealant manufacturer recommended when adhesion of sealant to joint substrates indicated as determined from preconstruction joint sealant substrate tests and field tests.
    2. Cleaners – chemical cleaners acceptable to sealant manufacturers and sealant backing manufacturers.
    3. Masking Tape – Non-staining, non-absorbent material with joint sealants and surfaces adjacent to joints
B. Materials need for proper application, but not specifically identified shall be of a quality not less than specified products.

2.7 APPROVED MANUFACTURERS

A. Mameco International; Model: Vulkem 116
B. Sika Corporation; Model: Sikaflex - 1a
C. Chemrex Inc. Sonneborn Building Prodcts Division; Model: NP1 or Sonolac
D. Pecora Corp.; Model: AC-20
E. Tremco Inc.; Model: Acrylic Latex 834
F. Or Equal

PART 3 – EXECUTION

3.1 SITE CONDITIONS

A. Contractor shall field verify necessary volumes, areas, dimensions, and quantities required to complete Work.
B. Work area shall be examined for conditions under which application of coating systems shall be performed for conditions that will adversely affect execution, permanence, or quality of coating system application. Any conditions identified as detrimental and unsatisfactory for Work under this Section shall be corrected prior to commencement of coating application. Any commencement of installation constitutes an acceptance of conditions and responsibility for satisfactory performance by Contractor.
C. Contractor shall maintain a clean site. Refuse, solid waste, hazardous waste, toxic waste, or trash from consumables shall be properly disposed of in designated containers. Paints and solvents shall not be disposed of by pouring on the ground. Solvent-soaked rags and oil soaked rags shall be returned for contaminant recovery and laundering.
D. Any items or flammable objects no longer in use shall be properly removed and/or disposed of as to prevent fire hazards and spontaneous combustion.

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E. Any items considered Household Hazardous Waste may be taken to the Household Hazardous Waste facility located at 4707B Deramus Ave, Kansas City, MO 64120. Accepted Household Hazardous Waste items are as follows:
   1. Antifreeze
   2. Fuels
   3. Hazardous Cleaners
   4. Hazardous Liquids
   5. Household Cleaners
   6. Paint
   7. Solvents
   8. Thinners
   9. Used Oils

   Refer to kcwater.us/programs/hhw for the full list of acceptable items that may be dropped off and the hours of operation.

F. Contractor shall be responsible for costs associated with containment and waste disposal that may result from execution of this Project.

3.2 EXAMINATION

A. Examine areas and conditions under application of sealant shall be performed for conditions that will adversely affect execution, permanence, or quality of sealant in presence of the installer.
B. Storage area shall be clean and neat at all times.

3.3 SURFACE PREPARATION

A. Storage area shall be clean and neat at all times.
B. Surfaces to be coated shall be clean, dry, and free from dust and any foreign matter that any foreign matter which might adversely affect adhesion or appearance.
C. Surface preparation debris shall be disposed of in compliance with applicable federal, state and local regulations. For lead-contaminated surface debris, refer to SSPC Guide 7.
D. Joint Surface Cleaning
   1. Remove all foreign material from joint substrates that could interfere with adhesion of join sealant
   2. Clean porous joint substrate surfaces (Concrete, masonry, and/or exterior insulation and finish systems) by brushing, grinding, mechanical abrading or a combination thereof to produce strong bond between joint and substrate.
   3. Remove laitance and form-release agents
   4. Clean nonporous joint substrate (Metal, glass) using chemical cleaners or other means that do not stain or harm substrates or leave residues that interfere with bonding adhesion.
E. Primers shall be applied as recommended by Manufacturer.
F. Masking Tape shall be applied to prevent contact of sealant or primer unintended sealants.

3.4 INSTALLATION

A. Adequate air ventilation shall be in place prior to commencement of coating applications.
B. Sealants shall be applied in accordance with manufacturer's instructions and using application methods best suited for obtaining full, uniform coverage and hide of surfaces to be sealed.
C. Install sealant backings
   1. Do not leave gaps between separate backings

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2. Do not damage integrity of sealant backing (stretching, twisting, puncturing, tearing, etc.)
3. Remove and replace wet absorbent materials with dry absorbent materials before application of sealant.

D. If sealant backing is not suitable for application, bond-breaker tape shall be used.
E. Apply sealant in full uniform cross-sectional shapes, without voids or recesses.
F. Tooling
   1. Use masking tape for surface protection and remove excess sealant from adjacent surfaces not protected by masking tape
   2. Profiles
      a. All profiles shall be provided per ASTM C1193.
         (i) Concave joint –Figure 8A
         (ii) Flush Joint –Figure 8B
         (iii) Recessed Joint –Figure 8C
G. Quality Control
H. Any joint sealant outside of the areas protected by masking tape shall be cleaned with manufacturer-approved materials.
I. Adequate measures shall be taken to protect join sealant throughout the curing period. Protection measures shall be taken against construction operations, dirt, debris, oil, or other soluble contaminants.

3.5 COMMISSIONING

A. Joint Sealants shall be inspected prior to being deemed acceptable for use. During inspection, CITY's representative, engineer, and painting contractor. Any deficiencies in the sealant application will be repaired at the Contractor's expense.
   1. When stain, dirt, or undercoats show through final coat, correct defects and cover with additional coats until coating is of uniform finish, color, appearance and coverage.
   2. Touch-up of minor damage shall be acceptable where result is not visibly different from surrounding surfaces. Where result is visibly different, either in color, sheen, or texture, recoat entire surface.
B. In the sealant has spilled, dripped or splattered in unintended areas and surfaces, it will be removed from surfaces accordingly. Contractor will be responsible for all cleanup and damage to any property due to applying sealant.
C. After commissioning is completed, CITY shall set a date for a one-year inspection. Inspection will be attended by a CITY's representative, engineer, and painting contractor. Any deficiencies in the sealant application will be repaired at the Contractor's expense.

END OF SECTION

TEMPLATE

SECTION 08220 – FRP DOORS AND FRAMES

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers fiber-reinforced plastic (FRP) doors and frames and their accessories.

B. Contractor shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:
   1. Section 01019 – Closeout Procedures
   2. Section 01740 - Warranty

1.03 REFERENCES

A. American National Standards Institute (ANSI)
   1. A250.4 – Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, and Frame Anchors

B. American Society for Testing and Materials (ASTM)
   1. C271/C271M – Standard Test Method for Density of Sandwich Core Materials
   2. C273/C273M – Standard Test Method for Shear Properties of Sandwich Core Materials
   3. C365/C365M – Standard Test Method for Flatwise Compressive Properties of Sandwich Cores
   4. C393/C393M – Standard Test Method for Core Shear Properties of Sandwich Constructions by Beam Flexure
   5. D256 – Standard Test Methods for Izod Pendulum Impact Resistance of Plastics D638 – Standard Test Method for Tensile Properties of Plastics
   6. D695 – Standard Test Method for Compressive Properties of Rigid Plastics
   7. D790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
   8. D2853 – Specification for Reinforced Olefin Polymers for Injection Molding and Extrusion

C. International Code Council (ICC)
   1. IBC 2018 Chapter 26– Plastic

D. Society of Automotive Engineers (SAE)
   1. J1553 – Cross Peel Test for Automotive-Type Adhesives for Fiber Reinforced Plastic Bonding

E. Underwriters Laboratory (UL)
   1. 10B – Standard for Fire Tests of Door Assemblies
   2. 10C – Standard for Positive Pressure Fire Tests of Door Assemblies
   3. 723 - Standard Test Method for Surface Burning Characteristics of Building Materials

1.04 Definitions

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A. UL 10C –Standard for Positive Pressure Fire Tests of Door Assemblies may also be referred to as UBC 7-2.
B. UL 723 - Standard Test Method for Surface Burning Characteristics of Building Materials may also be referred to as ASTM E84 or NFPA 255.

1.05 SUBMITTALS

A. Submit as specified in Section 01019 – Closeout Procedures.

B. Submit manufacturer's literature describing components to be provided, giving manufacturer's name, product component name, and line number for each component.

C. Technical Submittals Include, but not limited to the following:
   1. Catalog data
   2. General Arrangements
   3. Assembly and disassembly or repair instructions
   4. Fabrication Drawings
   5. Detail Drawings
   6. Installation Drawings
   7. Performance Data
   8. Instruction books and Operation and Maintenance manuals
   9. Spare parts lists

D. Quality Assurance Submittals
   1. Provide manufacturer's certification that products to be used comply with specified requirements and are suitable for intended application.

1.06 QUALITY ASSURANCE

A. Qualifications
   1. Equipment specified herein shall be the product of a reputable and qualified manufacturer who is of proven ability and has at least five (5) years of experience in the production of such equipment in sizes similar to those required on this project. The manufacturer shall have completed and made ready for operation at least twenty-five separate installations in the United States that have been in operation for at least five (5) years.
B. Sourcing – If more than one (1) FRP door and frame is procured via this section, FRP doors and frames shall be provided from a single manufacturer.
C. Identification – Products must include a nameplate securely mounted to the equipment and for the motor/driver. At a minimum the nameplate must include the following.
   1. Manufacturer's name, product name, and number
   2. Order Number
   3. Serial Number
   4. Speed (Motors only)
   5. Certification Stamps (AWWA, ASME, FM, NEMA, UL, etc.)
D. Pre-production Conference
   1. Before any design and manufacturing Work commences, a pre-production conference must be held and attended by City's Representative, Engineer, and Manufacturer's Technical Representative.

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2. At a minimum, the following topics shall be addressed and discussed during the pre-production conference.
    a. Contract Documents
    b. Project Safety Plan
    c. Schedule of technical submittals
    d. Quality Control
    e. Delivery, Storage, and Handling
    f. Field Representative Services

E. Manufacturer's Service
1. The Manufacturer's Technical Representative shall be available to provide on-site technical assistance during commissioning activities.

1.07 DELIVERY, STORAGE, AND HANDLING

A. All products shall be inspected for defective workmanship prior to shipment from factory.
B. All components and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment tools, and methods used in unloading, reloading, hauling, and shipping shall be such that components are not damaged.
C. For equipment exceeding 50 pounds, lifting eyes and lifting lugs shall be provided to allow for installation.
D. Boxes and packages shall be properly marked to show its net and total weight, contents within the box and/or package.
E. Items shall be marked as identified in delivery schedule and as shown in Submittals and include a complete list and bills of materials with each shipment. Each item requiring assembly shall be properly tagged and marked.
F. If items are shipped separately, they shall be tagged and indicated as such to facilitate proper assembly on-site.
G. Materials shall not be stored in buildings under construction until concrete, mortar, and plaster work is finished and dry.

1.08 WARRANTY

A. Equipment manufacturer shall provide a warranty for all items furnished in accordance with Section 01740. Warranty shall run concurrently with the Contractor's warranty and commence at final completion and CITY's acceptance.
B. Warranty shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate equipment design, improper assembly or erection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the manufacturer.
C. Fire-labeled doors shall include a written limited guarantee. Product shall be guaranteed for 10 calendar years at the time of purchase. Guarantee shall include but not limited to delamination due to corrosion, defective workmanship. A lifetime guarantee shall be provided for frames, windows, welded corners, and chemically bonded hinge reinforcements due to corrosion from the specific chemical environment.

PART 2 – PRODUCTS

2.01 DESIGN

A. Type(s)

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1. FRP doors and panels shall be of fire-rated type rated for 90 minutes.
2. Door construction shall be Category A type. Category B is not permitted.

B. Feature(s)
1. Chopped strand mat layers shall be used to provide bond integrity between gelcoat, laminated facing and internal door structure.
2. Knitted multi-layer materials with layers of unidirectional glass fiber oriented in both vertical and horizontal directions shall be used for structural reinforcement.
3. Heavy-duty FRP angle astragal shall be installed on inactive leafs of double door assemblies.
4. Cutouts shall be totally enclosed by internal high-density fire-resistant mineral core composite blocks.
5. Composite blocks shall be incorporated into door sub-frame.
6. Openings shall be fused to both door skins.
7. Corner screws shall not be visible on interior or exterior door frame faces.

C. Fabrication
1. Door fabrication must be completed in factory including drilling and machining for hardware, and cutouts for louvers and door lights.
2. Field-modifications such as including louvers or door lights is not permitted.
3. Construction shall be of the seamless press-molded type.
4. Composite blocks (as applicable) shall be incorporated into door sub-frame prior to press-molding and machining.
5. Laminated FRP sheets shall be applied while wet and uncured to internal door sub-frame/core assembly.
6. After application of laminated FRP sheet, it shall be press-molded under heat and pressure.
7. Molding pressure and resin gel time shall be sufficient to allow for penetration of resin into cellular structure of core.
8. Composite Door panel must be integrally fused over full surface area.
9. For flat, warp-free surfaces, pressure shall continuously be applied during curing.

2.02 COMPONENTS

A. Components listed below are additional requirements for FRP door and frame components. Any components not listed below shall meet all other requirements of this Section.

B. Door
1. Core
   a. Type: Fire-resistant mineral core.
   b. Feature: Shall be enclosed within 1/8 in. thick intumescent and FRP-laminated edge perimeter.
2. Door Facing
   a. Chemical-resistant Class 1 Flame Spread thermosetting polyester resin formulation with glass-fiber reinforcing layers.
3. Door lights/ Vision frames
   a. Size: 36 in. x 36 in.
4. Door louvers
   a. Type: Commercially available UL fire-rated kit.
   b. Size: Maximum 24 in. x 24 in.
5. Coats

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a. Type(s)
   (i) Integrally-molded Ultraviolet light stabilized marine-grade NPG-isophthalic polyester gelcoat 25-30 mils (Preferred Indicative)
   (ii) Industrial urethane chemical coating color topcoat (Indicative)
b. Features(s)
   (i) Gelcoat facings to have slight textured semi-gloss finish to minimize visual effects of wear and tear.
   (ii) Door face color shall be selected from manufacturer's available colors.
   (iii) Gelcoat shall not be spray-applied as a secondary coating.

C. Door Frame:
1. Type: Double Rabbet
2. Depth: 5 ¾ in.
3. Face: 2 in.
4. Thickness 3/16 in.
5. Door Jamb:
   a. Depth: 4 in.
   b. Face: 1 in.
6. Doorstop: 5/8 in. integral-type
7. Wall anchors
   a. Type: Expanding sleeve for Masonry walls
   b. Diameter: 3/8 in.
   c. Length: 5 in.
8. Material(s):
   a. Cavity space will be filled with fire-resistant composite material with minimum density of 25 lb/ft^3.
   b. Corner Screws and wall anchors shall be 304 Stainless Steel.
   c. Hollow metals or Stainless Steel frames are not acceptable.
   d. Post-applied or exposed intumescent components or products are not acceptable.
9. Coats
   a. Factory-applied industrial urethane chemical coating color topcoat.
   b. If using an existing door frame, Contractor may spray gelcoat as a secondary coating.

2.03 MATERIALS OF CONSTRUCTION (MOC)

A. For general requirements for Materials of Construction, refer to the Blue River Screen House Basis of Design Report.
B. All materials shall be suitable for 90 minute fire-rated building elements.
C. Corner screws, wall anchors, fasteners and hardware shall be 304 Stainless Steel
D. Material properties
1. Coupons shall be used to determine the properties of manufactured materials.

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2. Core Material Minimum Requirements

Parameter		Value	Unit Of Measure
Density		2.42	lb/ft3
Compressive Strength		53	psi
Compressive Density		2110	psi
Shear Strength	Longitudinal Direction	68.2	psi
	Transverse Direction	25.8	psi
Shear Modulus	Longitudinal Direction	6940	psi
	Transverse Direction	1878	psi
Shear Elongation	Longitudinal Direction	1.73	%
	Transverse Direction	2.72	%
Maximum Facing Stress	Longitudinal Direction	735	psi
	Transverse Direction	289	psi
Core Shear Stress	Longitudinal Direction	63.8	psi
	Transverse Direction	24.9	psi
Modulus of Elasticity (EI) - Short Beam	Longitudinal Direction	4.92×10^4	psi
	Transverse Direction	1.97×10^4	psi
Maximum Facing Stress	Longitudinal Direction	9011	psi
	Transverse Direction	4727	psi
Maximum Core Shear Stress	Longitudinal Direction	48.3	psi
	Transverse Direction	23.5	psi
Modulus of Elasticity (EI) - Long Beam	Longitudinal Direction	1.14×10^5	psi
	Transverse Direction	7.23×10^5	psi
Stiffness "D" - Long Beam	Longitudinal Direction	379270	psi
	Transverse Direction	260608	psi

3. Protruded Structural Shapes (stiles, rails, frames, astragals, etc.)
   a. Tensile Strength: 30,000 psi
   b. Comprehensive Strength: 30,000 psi
   c. Flexural Strength: 30,000 psi
   d. Flexural Modulus: 1,600,000 psi
   e. Shear Strength: 4,500 psi
   f. Impact, notched: 25 ft-lb/in
   g. Barcol hardness: 50
   h. Fire Resistance: E84 Class 1
4. Adhesive
   a. Tensile Strength: Minimum 2000 psi
   b. Cross Peel: Minimum 330 psi for each of the following tests
      (i) 8 day 25C at 100% Humidity
      (ii) 7 day seawater immersion
      (iii) 30 day saltwater immersion

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(iv) 72 hour gasoline immersion

c. Cross Peel: Minimum 300 psi for the following test.
   (i) 72 hour Sulfuric Acid Immersion
      1. Sulfuric Acid to be 20% by weight

2.04 PERFORMANCE TESTING

A. Doors and frames shall be rated per ANSI A250.4 1,000,000 cycle test. Cycle test shall not indicate any failure of any of design features of door and frame.

2.05 ACCEPTABLE MANUFACTURERS

A. FRP Doors and Frames
   1. Corrim Company
   2. Metropolitan Door Industries
   3. Tiger Door, LLC.
   4. Or Equal

B. FRP Products
   1. Strongwell Corporation
   2. Fibergate Composite Structures, Inc.
   3. Or Equal

C. Door Hardware
   1. Hinges
      a. Hager Companies
      b. IVES Hardware; and Ingersoll-Rand Company
      c. McKinney Products Company; an ASSA ABLOY Group Company
      d. Stanley Commercial Hardware; Division of the Stanley Works
      e. Or Equal
   2. Latchbolt
      a. Schlage Commercial Lock Division
      b. Or Equal
   3. Surface Closer
      a. LCN Closers
      b. Sargent Manufacturing Company; an ASSA ABLOY Group Company
      c. Von Duprin; an Ingersoll-Rand Company
      d. Or Equal
   4. Wall-Mount and Floor-Mount Stops
      a. IVES Hardware; an Ingersoll-Rand Company
      b. Rockwood Manufacturing Company
      c. Stanley Commercial Hardware; Stanley Works Division
      d. Or Equal
   5. Gaskets
      a. Hage Companies
      b. National Guard Products
      c. Pemco Manufacturing Co; an ASSA ABLOY Group Company
      d. Sealeze; a unit of Jason Inc.
      e. Or Equal

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6. Protective Trim Units
    a. IVES Hardware; an Ingersoll-Rand Company
    b. Rockwood Manufacutring Company
    c. Trimco
    d. Or Equal
7. Exit Devices and Auxiliary Items
    a. Precision Hardware, Inc.' Model: Stanless Security Soutions, Inc.
    b. SARGENT Manufacturing Company; an ASSA ABLOY Group company
    c. Von Duprin; an Ingersoll-Rand Company
    d. Or Equal
8. Thresholds
    a. Hager Companies
    b. National Guard Products
    c. Pemko Manufacturing Co; an ASSA ABLOY Group Company
    d. Sealeze; a unit of Jason, Inc.
    e. Or Equal

PART 3 – EXECUTION (NOT USED)

END OF SECTION

TEMPLATE

SECTION 09961 – CONCRETE COATINGS

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers surface preparation and field painting necessary to finish all structures and concrete building surfaces unless otherwise indicated.

B. Contractor shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:

1.03 DEFINITIONS

A. All references to SSPC-SP-13/NACE No. 6 designate the definitions and other requirements in these documents.

B. Paint – Coatings including all reference to primers, acrylics, elastomers, and other coatings.

C. Dry Film Thickness (DFT) - Thickness of a coat of paint in fully cured state measured in mils (1/1000 in)

1.04 REFERENCES

A. American Concrete Institute (ACI)

1. 344R-T – Design and Construction of Circular Pre-stressed Concrete Structures with Circumferential Tendons
2. 344R-W – Design and Construction of Circular Wire and Strand Wrapped Pre-stressed Concrete Structures
3. 350R-01- Code Requirements for Environmental Engineering Concrete Structures
4. 350.1 – Testing of Reinforced Concrete Structures for Water Tightness
5. 350.2 – Concrete Structures for Containment of Hazardous Material
6. 503 – Use of Epoxy Compounds with Concrete
7. 503 R-90 – Guide to Sealing Joints in Concrete Structures

B. American Society for Testing and Materials (ASTM)

1. D01.23 – Test Method for Nondestructive Measurement of Dry Film Thickness of Applied Organic Coatings Using an Ultrasonic Gauge
2. D16 – Terminology Relating to Paint, Varnish, Lacquer, and Related Products
3. D1005 – Test for determining dry film thickness
4. D3359 – Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
5. D4258 – Practice for Surface Cleaning Concrete for Coating
6. D4259 – Practice for Abrading Concrete
7. D4262 – Test Method for pH of Chemically Cleaned or Etched Concrete Surfaces
8. D4414 – Standard Practice for Measurement of Wet Film Thickness by Notch Gauges
9. D4541 – Test Method for Pull Off Strength of Coatings Using Portable Adhesion-Testers
10. D4787 – Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates
11. D5162 – Standard Practice for Discontinuity (Holiday) Testing of Nonconductive Protective Coating on Metallic Substrates

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12. D6677 – Standard Test Method for Evaluating Adhesion by Knife
13. E337 – Test Method for Measuring Humidity with a Psychrometer

C. International Concrete Repair Institute (ICRI)
1. Guideline No. 03732 – Guide to Surface Preparation of Concrete to Receive Sealers, Coatings, and Polymer Overlays

D. National Association of Corrosion Engineer (NACE)
1. RP 6F-166 – Recommended Practice for Inspection of Linings on Steel and Concrete

E. Society for Protective Coatings (SSPC)
1. PA1 – Painting Application Specification
2. PA2 – Measurement of Dry Paint Thickness with Magnetic Gages
3. SP1 –Solvent Cleaning
4. SP2 – Hand Tool Cleaning
5. SP3 – Power Tool Cleaning
6. SP10 – Near White Metal Blast Cleaning
7. SP12 – Surface Preparation and Cleaning of Steel and Other Hard Materials by High- and Ultra High- Pressure Water Jetting Prior to Recoating
8. SP13 – Surface Preparation of Concrete
9. TU 2 – Design, Installation, and Maintenance of Coating Systems for Concrete Used in Secondary Containment

1.05 SUBMITTALS

A. Product Data
1. Submit manufacturer's literature describing products to be provided, giving manufacturer's name, product name, and product line number for each material.
2. Submit technical data sheets and safety data sheets from Manufacturer. Enough information must be included from Manufacturer for a complete installation by Contractor including but not limited to material storage and handling, mixing, thinning, application, and curing.
3. Any substitution of products made by Contractor shall be approved by CITY. Performance data and color shall be provided, reasons for the substitution shall be identified, and approved substitutions shall not incur an increase in material cost.
4. Schedule of Products and Coating Systems. Schedule shall include the following information:
   a. Surfaces for system to be applied
   b. Surface preparation method and degree of cleanliness
   c. Product manufacturer, name, and number.
   d. Method of application
   e. Dry film thickness (DFT) per coat of applied coating
5. Manufacturer Color Charts for selection and acceptance.
6. Manufacturer's Installation procedures if not on product data sheets.

B. Quality Assurance Submittals
1. Provide manufacturer's certification that products to be used comply with specified requirements and are suitable for intended application.
2. Submit listing of not less than 5 of applicator's most recent applications representing similar scope and complexity to Project requirements. List shall include information as follows:
   a. Project Name and address

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b. Name of Owner
c. Name of Contractor
d. Name of Engineer
e. Date of Completion

1.06 QUALITY ASSURANCE

A. Qualifications
1. Provide products from a company specializing in manufacture of coatings with a minimum of 10 years of experience.
2. Applicator shall be trained in application techniques and procedures of coating materials and shall demonstrate a minimum of 5 years successful experience in such application. Throughout application, Contractor shall maintain a crew who are fully qualified persons, competent persons and have previously applied coating systems listed herein.

B. Sourcing
1. All coating materials shall be products from a single manufacturer.
2. Secondary materials recommended by coating system manufacturer shall be provided for proper installation of coating.

1.07 WARRANTY

A. Equipment manufacturer shall provide a three (3) year warranty for all items furnished in accordance with Section 01740. Warranty shall run concurrently with the Contractor's warranty and commence at final completion and CITY's acceptance.

B. Warranty shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate equipment design, improper assembly or erection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the manufacturer.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Follow the provisions for the delivery, storage, protection and handling products to and at site provided in Section 01000 – General Project Requirements.

B. Materials shall be stored in a clean dry area and within temperature range in accordance with manufacturer's instructions. Containers shall be sealed until ready for use.

C. All components and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment tools, and methods used in unloading, reloading, hauling, and shipping shall be such that components are not damaged.

D. Boxes and packages shall be properly marked to show its net and total weight, contents within the box and/or package.

1.09 PROJECT SCHEDULING

A. Work may be necessary during cold, hot, or inclement weather. If necessary, Contractor shall provide, heating and or dehumidification equipment as required during inclement hot, cold, or humid weather to prepare, blast, prime, coat, cure, or disinfect the interior surface of the tanks to finish within the specified time frame. Contractor shall include pricing associated with weather related costs in bid.

PART 2 – PRODUCTS

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2.01 All products listed herein are approved for use. Any product to be approved by CITY must be a product from a CITY-approved manufacturer.

2.02 Installation of products must comply with manufacturer's written installation procedures and individual product data sheet application bulletins. If no DFT is listed herein, product shall be applied per product data pages. Any discrepancies shall be reported to CITY's representative and Paint Manufacturer's Representative.

2.03 APPROVED MANUFACTURERS

A. Tnemec
B. Sherwin Williams
C. Or Equal

2.04 CONCRETE SURFACE REPAIR

A. Refer to Section 03900 – Concrete Restoration and Cleaning.

2.05 JOINT AND CRACK DETAILS

A. Refer to Section 03900 – Concrete Restoration and Cleaning.

2.06 REBAR COATING

A. Sherwin-Williams Macropoxy 646 Epoxy B58W610/B58V600 – 5.0-10.0 mils DFT

2.07 OPAQUE CONCRETE SEALER SYSTEM

A. Total targeted application (primer and finish coats) shall be no less than 5.0 mil DFT.
B. Sherwin-Williams Application
    1. Primer – SWD DOT Sealer B97W10
        a. Wet Application -180 - 235 ft^2/gal
        b. Dry Film Thickness - 2.3 mil DFT – 3.0 mil DFT
    2. Finish Coat – SWD DOT Sealer B97W10
        a. Wet Application - 180 - 235 ft^2/gal
        b. Dry Film Thickness - 2.3 mil DFT – 3.0 mil DFT
C. Tnemec Application - For ACI 211 Severe Exposures requiring polyamide coatings.
    1. Parge Coat – Series 218 Mortarclad ¼" Thickness
    2. Finish Coat – Series 435 Perma-Glaze – 80 mil DFT – 125 mils DFT

2.08 SUBSTITUTIONS

A. Materials specified herein shall not preclude consideration of equivalent materials. Equivalent materials shall be submitted to Engineer for consideration and shall be made at least ten (10) business days prior to the date of bids.
    1. Requests for substitution shall include evidence of satisfactory past performance on water tanks.
    2. Substitutions will not be considered that change number of coats or do not meet specified total dry film thickness.
    3. Contractor shall state in the bid the amount of deduct to use equivalent materials to those specified.
    4. Substitutions of equal materials must induce individual products performance test data for comparison to the specified products performance test data.

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B. Substitutions of equal materials must include the individual product performance test data for comparison to the performance test data of specified products herein.

2.09 ACCESSORIES

A. Application accessories shall be used as indicated in coating manufacturer's application instructions, including but not limited to cleaning agents, etching agents, cleaning cloths, sanding materials, and clean-up materials.

B. Materials need for proper application, but not specifically identified shall be of a quality not less than specified products.

PART 3 – EXECUTION

3.01 SITE CONDITIONS

A. Contractor shall field verify necessary volumes, areas, dimensions, and quantities required to complete Work.

B. Work area shall be examined for conditions under which application of coating systems shall be performed for conditions that will adversely affect execution, permanence, or quality of coating system application. Any conditions identified as detrimental and unsatisfactory for Work under this Section shall be corrected prior to commencement of coating application. Any commencement of installation constitutes an acceptance of conditions and responsibility for satisfactory performance by Contractor.

C. Contractor shall maintain a clean site. Refuse, solid waste, hazardous waste, toxic waste, or trash from consumables shall be properly disposed of in designated containers. Paints and solvents shall not be disposed of by pouring on the ground. Solvent-soaked rags and oil soaked rags shall be returned for contaminant recovery and laundering.

D. Any items or flammable objects no longer in use shall be properly removed and/or disposed of as to prevent fire hazards and spontaneous combustion.

E. Any items considered Household Hazardous Waste may be taken to the Household Hazardous Waste facility located at 4707B Deramus Ave, Kansas City, MO 64120. Accepted Household Hazardous Waste items are as follows:

1. Antifreeze
2. Fuels
3. Hazardous Cleaners
4. Hazardous Liquids
5. Household Cleaners
6. Paint
7. Solvents
8. Thinners
9. Used Oils

Refer to kcwater.us/programs/hhw for the full list of acceptable items that may be dropped off and the hours of operation.

F. Contractor shall be responsible for costs associated with containment and waste disposal that may result from execution of this Project.

3.02 EXAMINATION

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A. Examine areas and conditions under application of coating system shall be performed for conditions that will adversely affect execution, permanence, or quality of coating system application.
B. Air intakes, returns, or other air breathing equipment which may pull air near fresh coatings shall be covered.
C. Storage area shall be clean and neat at all times.

3.03 CONCRETE REPAIR/RESTORATION

A. Refer to Section 03900 – Concrete Restoration and Cleaning.

3.04 SURFACE PREPARATION

A. Existing coatings must be removed. Existing curing and sealing compounds shall be removed per ASTM D4259.
B. Guideline No. 03732, Guide to Surface Preparation of Concrete to Receive Sealers, Coatings, and Polymer Overlays shall be used to visually evaluate the concrete surface profile.
C. All concrete surfaces must be cured and dry. Inspect concrete surface for soundness, flatness, levelness and overall condition. Report any discrepancies to City's representative.
D. Surfaces to be prepared in accordance with SSPC-SP13. Vapor Abrasive Blasting equipment shall be used to minimize the amount of water and abrasive needing to be contained from water flow below.
E. Surface profile for the Concrete Coating Systems shall be created and adhere to the following profile numbers in accordance with methods described in Guideline No. 03732
    1. Thin film to 10 mils CSP-1 to CSP-3
    2. 10 mils – 40 mils CSP-3 to CSP-5
    3. Mortars and Fillers to 3/16" CSP-4 to CSP-6
    4. Mortars and Fillers 3/16" – ¼" CSP-5 to CSP-9

3.05 COATING

A. Coatings shall be applied and cured within the air and surface temperature ranges, and relative humidity ranges in accordance with manufacturer's instructions.
B. Surfaces shall not be prepared or coatings applied in rain, snow, fog, or mist.
C. Coating work shall be scheduled to avoid excessive dust and airborne contaminants. During coating application and curing, work areas shall be protected from excessive dust and airborne contaminants.
D. Coatings shall not be sprayed if wind velocity is above manufacturer's limit. If in confined or enclosed areas, ventilation shall be provided during coating evaporation stage.
E. Application equipment shall be suitable for use and found in clean, properly adjusted for application, and recommended application type by manufacturer.
F. Coating system shall be applied per manufacturer's instructions including, but not limited to:
    1. Coating Application Equipment
    2. Full, uniform coverage
    3. Wet & Dry Film Thicknesses
    4. Minimum number of coats
    5. Re-coat times
    6. Application and curing conditions
    7. Product Thinning Requirements.

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3.06 COMMISSIONING

A. Concrete coating shall be inspected prior to commissioning. During inspection, CITY's representative, engineer, and painting contractor. Any deficiencies in the coating system will be repaired at the Contractor's expense.
   1. When stain, dirt, or undercoats show through final coat, correct defects and cover with additional coats until coating is of uniform finish, color, appearance and coverage.
   2. Touch-up of minor damage shall be acceptable where result is not visibly different from surrounding surfaces. Where result is visibly different, either in color, sheen, or texture, recoat entire surface.

B. In the event paint has spilled, dripped or splattered, it will be removed from Surfaces accordingly. Contractor will be responsible for all cleanup and damage to any property due to painting.

C. After commissioning is completed, CITY shall set a date for a one-year inspection. Inspection will be attended by a CITY's representative, engineer, and painting contractor. Any deficiencies in the coatings system will be repaired at the Contractor's expense.

END OF SECTION

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SECTION 09970– STEEL COATINGS

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers surface preparation, prime coating, finish coatings, curing, touch up, cleaning, and disinfection as necessary to complete Work as indicated herein and as shown on drawings.

B. Properly dispose of existing steel coatings as required herein. Samples will be provided by CITY to Contractor. Disposal shall be determined as part of remediation efforts.

C. Use coating systems specified in this Section to finish all steel surfaces including the underside of steel decking, carbon steel piping, and carbon steel components not already shop-primed and coated by equipment manufacturers.

1.02 RELATED SECTIONS

A. Section 01000 – General Project Requirements

1.03 DEFINITIONS

A. PAINT - In reference to zinc primers, latex, polyurethane and epoxy type coatings and application of these materials.

B. DRY FILM THICKNESS (DFT) - Thickness, measured in mils (1/1000 inch), of a coat of paint in cured state.

1.04 REFERENCES

A. Applicable Standards:

1. American National Standards Institute (ANSI):
   a. A13.1 – Scheme for the Identification of Piping Systems
   b. Z53.1 – Safety Color Code for Marking Physical Hazards
2. American Society for Testing and Materials (ASTM):
   a. D16 – Terminology Relating to Paint, Varnish, Lacquer, and Related Products
   b. D1005 – Test for determining Dry-Film Thickness
   c. D2092 – Guide for Treatment of Zinc-Coated (Galvanized) Steel Surfaces for Painting
   d. D3359 – Test Method for Measuring Adhesion by Tape Test
   e. D4417 – Test for determining surface profile
   f. D4541 – Test Method for Pull Off Strength of Coatings Using Portable Adhesion-Testers
   g. D5402 – Test for Assessing the Solvent Resistance of Organic Coating
3. American Water Works Association
   a. C652-02 – Disinfection of Water Storage Facilities
   b. D102-06 - Coating Steel Water Storage Tanks
   c. M42 - Steel Water Storage Tanks
4. National Sanitation Foundation (NSF)
   a. 61 – Drinking Water System Components – Health Effects
5. Society for Protective Coatings:
   a. Guide 7 – Guide to the Disposal of Lead-Contaminated Surface Preparation Debris
   b. PA 1 – Shop, Field, and Maintenance Painting of Steel
   c. PA 2 – Measurement of Dry Paint Thickness with Magnetic Gauges

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d. PA Guide 3 – A Guide to Safety in Paint Application
e. PA Guide 6 – Guide for Containing Surface Preparation Debris Generated During Paint Removal Operations
f. Painting Manual – Volume 1, Good Painting Practice
g. Painting Manual – Volume 2, System and Specifications
h. SP1 –Solvent Cleaning
i. SP2 –Hand Tool Cleaning
j. SP3 –Power Tool Cleaning
k. SP5 –White Metal Blast Cleaning
l. SP6 –Commercial Blast Cleaning
m. SP7 –Brush-Off Blast Cleaning
n. SP10 –Near White Metal Blast Cleaning
o. SP11 –Power Tool Cleaning to Bare Metal
p. SP12 – Water Jetting
q. SP13 – Surface Preparation of Concrete

1.05 SUBMITTALS

A. Product Data
1. Submit manufacturer's literature describing products to be provided, giving manufacturer's name, product name, and product line number for each material.
2. Submit technical data sheets and safety data sheets from Manufacturer. Enough information must be included from Manufacturer for a complete installation by Contractor including but not limited to material storage and handling, mixing, thinning, application, and curing.
3. Any substitution of products made by Contractor shall be approved by CITY. Performance data and color shall be provided, reasons for the substitution shall be identified, and approved substitutions shall not incur an increase in material cost.
4. Schedule of Products and Paint Systems. Schedule shall include the following information:
   a. Surfaces for system to be applied
   b. Surface preparation method and degree of cleanliness
   c. Product manufacturer, name, and number.
   d. Method of application
   e. Dry film thickness (DFT) per coat of applied coating
5. Manufacturer Color Charts for selection and acceptance.
6. Manufacturer's Installation procedures if not on product data sheets.

B. Quality Assurance Submittals
1. Provide manufacturer's certification that products to be used comply with specified requirements and are suitable for intended application.
2. If paint contains lead, provide a document by the manufacturer indicating lead content does not exceed the limit of 0.06% by weight of nonvolatile content as specified herein.
3. Submit listing of not less than 5 of applicator's most recent applications representing similar scope and complexity to Project requirements. List shall include information as follows:
   a. Project Name and address
   b. Name of Owner
   c. Name of Contractor

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d. Name of Engineer
e. Date of Completion

1.06 QUALITY ASSURANCE

A. Qualifications
   1. Provide products from a company specializing in manufacture of coatings with a minimum of 10 years of experience.
   2. Applicator shall be trained in application techniques and procedures of coating materials and shall demonstrate a minimum of 5 years successful experience in such application. Throughout application, Contractor shall maintain a crew who are fully qualified persons, competent persons and have previously applied coating systems listed herein.

B. Sourcing
   1. For all carbon steel surfaces, all coating materials shall be products from a single manufacturer.
   2. Secondary materials recommended by coating system manufacturer shall be provided for proper installation of coating.

1.07 WARRANTY

A. Equipment manufacturer shall provide a three (3) year warranty for all items furnished in accordance with Section 01740. Warranty shall run concurrently with the Contractor's warranty and commence at final completion and CITY's acceptance.

B. Warranty shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate equipment design, improper assembly or erection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the manufacturer.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Follow the provisions for the delivery, storage, protection and handling products to and at site provided in Section 01000 – General Project Requirements.

B. Pipe, fittings, and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment tools, and methods used in unloading, reloading, hauling, and laying pipe and fittings shall be such that pipe, fittings and coatings are not damaged.

C. Materials shall be stored in a clean dry area and within temperature range in accordance with manufacturer's instructions. Containers shall be sealed until ready for use.

D. All components and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment tools, and methods used in unloading, reloading, hauling, and shipping shall be such that components are not damaged.

E. Boxes and packages shall be properly marked to show its net and total weight, contents within the box and/or package.

1.09 PROJECT SCHEDULING

A. Work must be completed in a period from September 15th - June 15th. Water System requires full service of the tank from June 16th – September 14th. Tops, framing/pilasters of tanks may be completed while tank is in full service.

B. Work may be necessary during cold, hot, or inclement weather. If necessary, Contractor shal provide, heating and or dehumidification equipment as required during inclement hot, cold, or

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humid weather to prepare, blast, prime, coat, cure, or disinfect the interior surface of the tanks to finish within the specified time frame. Contractor shall include pricing associated with weather related costs in bid.

C. After the tank has been drained, tank interior shall be prepared and painted first.
D. The tank interior and the tank exterior may be completed at the same time; however, the tank interior shall take priority when Work tasks between the tank exterior and tank interior are sharing the same resources.
E. The exterior of the tank shall not be painted with water inside of the tank.
F. Contractor must provide access for inspections by Water Services Department throughout the duration of the project.

PART 2 – PRODUCTS

2.01 GENERAL

A. Any and all coating materials used during this work must conform to the restrictions of the US Environmental Protection Agency, local and state authorities having jurisdiction. CITY and Engineer shall be notified of any materials not adhering to regulations.
B. Material Requirements
   1. Materials furnished for each coating system must be compatible to the substrate.
   2. Entire coating system shall be provided by the same coating manufacturer for bare-steel surfaces. If a material has a prime-coat applied in the shop, Contractor shall inform Engineer and determine if finish coats are compatible with shop-primed coats.
   3. Coatings shall be lead-free unless otherwise specified. In addition to being lead free, coatings shall not use zinc-chromate, strontium chromate, asbestos, mercury, or mercury compounds.
   4. Zinc-rich primers may have a lead content not exceeding 0.06% by weight of nonvolatile content.
   5. Wax coating for tank interiors shall not be used on new tanks.
   6. Paints for interior wet applications must be listed by NSF International.
C. Coatings not listed herein must be approved for use by CITY.
D. Intermediate Coatings shall be selected by Manufacturer to provide the best hide and contrast ratio with the finish color.
E. Finish Coatings may require two coats dependent on application method and color of intermediate coat.

2.02 APPROVED MANUFACTURERS

A. Tnemec
B. Sherwin-Williams
C. Or Equal

2.03 EXTERIOR STEEL COATINGS

A. Surface Preparation
   1. All oil, grease, soil, dirt and other soluble contaminants shall be removed in accordance with SSPC-SP1 Specification for Solvent Cleaning. Surface must be abrasive blast cleaned for commercial finish in accordance with SSPC-SP6 Commercial Blast Cleaning. A minimum angular surface profile of 2.0 mils is required.
B. Tnemec Application

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1. Prime Coat – Series 91-H2O Hydro-Zinc Primer – 2.5-3.5 mils DFT
2. Intermediate Coat – Series 73 Endura-Shield – 2.0-3.0 mils DFT
3. Finish Coat – Series 700 HydroFlon – 2.0-3.0 mils DFT
    a. RGB Colors: Selected by CITY

C. Sherwin-Williams Application
1. Prime Coat – Corothane I Galvapak 2K Zinc Primer – 2.5-3.5 mils DFT
2. Intermediate Coat – Acrolon 218 HS Acrylic Polyurethane – 2.0-3.0 mils DFT
3. Finish Coat – Fluorokem HS Fluoropolymer Urethane – 2.0-3.0 mils DFT
    a. RGB Colors: Selected by CITY

D. Or Equal

2.04 TANK INTERIOR COATINGS

A. Surface Preparation
1. All oil, grease, soil, dirt and other soluble contaminants shall be removed in accordance with SSPC-SP1 Specification for Solvent Cleaning. Surface must be abrasive blast cleaned for commercial finish in accordance with SSPC-SP6 Commercial Blast Cleaning. A minimum angular surface profile of 2.0 mils is required.

B. Tnemec Application
1. Prime Coat – Series 91-H2O Hydro-Zinc Primer – 2.5-3.5 mils DFT
2. Intermediate Coat – Series N140-1255 Pota Pox – 4.0-6.0 mils DFT
3. Finish Coat – Series N140-15BL Pota-Pox – 4.0-6.0 mils DFT
    a. RGB Colors: Selected by CITY

C. Sherwin-Williams Application
1. Prime Coat – Corothane I Galvapak 2K Zinc Primer – 2.5-3.5 mils DFT
2. Intermediate Coat – Macropoxy 5500LT – 4.0-6.0 mils DFT
3. Finish Coat – Macropoxy 5500LT – 4.0-6.0 mils DFT
    a. RGB Colors: Selected by CITY

D. Or Equal

2.05 ABOVEGROUND PIPING

A. Surface Preparation
1. All oil, grease, soil, dirt and other soluble contaminants shall be removed in accordance with SSPC-SP1 Specification for Solvent Cleaning. Surface must be abrasive blast cleaned for a commercial finish in accordance with SSPC-SP3 Power Tool Cleaning. A minimum angular surface profile of 2.0 mils is required.

B. Tnemec Application
1. Prime Coat – Series 135 Chembuild – 3.0-5.0 mils DFT
2. Finish Coat – Series 1074 Endura-Shield – 2.0-3.0 mils DFT
    a. RGB Colors: Selected by CITY

C. Sherwin-William Application
1. Prime Coat – Macropoxy 646 FC – 3.0-5.0 mils DFT
2. Finish Coat – Acrolon 218 HS Acrylic Polyurethane – 2.0-3.0 mils DFT
    a. RGB Colors: Selected by CITY

D. Or Equal

2.06 SUBSTITUTIONS

TEMPLATE

A. Materials specified herein shall not preclude consideration of equivalent materials. Equivalent materials shall be submitted to Engineer for consideration and shall be made at least ten (10) business days prior to the date of bids.
    1. Requests for substitution shall include evidence of satisfactory past performance on water tanks.
    2. Substitutions will not be considered that change number of coats or do not meet specified total dry film thickness.
    3. Contractor shall state in the bid the amount of deduct to use equivalent materials to those specified.
    4. Substitutions of equal materials must induce individual products performance test data for comparison to the specified products performance test data.
B. Substitutions of equal materials must include the individual product performance test data for comparison to the performance test data of specified products herein.

2.07 ACCESSORIES

A. Application accessories shall be used as indicated in coating manufacturer's application instructions, including but not limited to cleaning agents, etching agents, cleaning cloths, sanding materials, and clean-up materials.
B. Materials need for proper application, but not specifically identified shall be of a quality not less than specified products.

PART 3 – EXECUTION

3.01 SITE CONDITIONS

A. Contractor shall field verify necessary volumes, areas, dimensions, and quantities required to complete Work.
B. Work area shall be examined for conditions under which application of coating systems shall be performed for conditions that will adversely affect execution, permanence, or quality of coating system application. Any conditions identified as detrimental and unsatisfactory for Work under this Section shall be corrected prior to commencement of coating application. Any commencement of installation constitutes an acceptance of conditions and responsibility for satisfactory performance by Contractor.
C. Contractor shall maintain a clean site. Refuse, solid waste, hazardous waste, toxic waste, or trash from consumables shall be properly disposed of in designated containers. Paints and solvents shall not be disposed of by pouring on the ground. Solvent-soaked rags and oil soaked rags shall be returned for contaminant recovery and laundering.
D. Any items or flammable objects no longer in use shall be properly removed and/or disposed of as to prevent fire hazards and spontaneous combustion.
E. Any items considered Household Hazardous Waste may be taken to the Household Hazardous Waste facility located at 4707B Deramus Ave, Kansas City, MO 64120. Accepted Household Hazardous Waste items are as follows:
    1. Antifreeze
    2. Fuels
    3. Hazardous Cleaners
    4. Hazardous Liquids
    5. Household Cleaners
    6. Paint

TEMPLATE

7. Solvents
8. Thinners
9. Used Oils

Refer to kcwater.us/programs/hhw for the full list of acceptable items that may be dropped off and the hours of operation.

F. Contractor shall be responsible for costs associated with containment and waste disposal that may result from execution of this Project.

3.02 SITE PREPARATION

A. Adjacent buildings, structures, vehicles, roadways, and site shall be protected from paint and debris incurred during preparation. Coating applied areas must be fully encapsulated during surface preparation procedures and coating applications. Refer to SSPC Guide 6 for Containing Debris Generated during Paint Removal Operations.
B. Mechanical equipment, controls, valves, or other equipment not requiring painting must be protected surface preparation and coating application.
C. Air intakes, returns, or other air breathing equipment which may pull air near fresh coatings shall be covered.
D. Equipment name plates, data plates, code stamps, or UL labels shall be protected from coating applications.
E. Any shop-fabricated pipe, fitting, component, or accessories that has been prime coated prior to arrival upon Site shall be checked and confirmed to be free of any coating defects. Any defects identified by Contractor shall be fixed and repaired at time of defect identification.
F. Paint shall not be allowed to splatter on Site, and is shall only be applied to intended surfaces as indicated herein and per Drawings. Any spilled, splashed, or splattered materials shall be promptly removed.
G. Storage area shall be clean and neat at all times.

3.03 SURFACE PREPARATION

A. Surfaces to be coated shall be clean, dry, and free from dust and any foreign matter that any foreign matter which might adversely affect adhesion or appearance.
B. Surface preparation debris shall be disposed of in compliance with applicable federal, state and local regulations. For lead-contaminated surface debris, refer to SSPC Guide 7.
C. If existing surface has a wax coating, the old wax coating must be completely removed prior to coating application.
D. Weld slag, weld spatter, rough edges and sharp edges of weld seams shall be ground smooth as necessary.
E. For piping systems, the removal of all loose mill scale, loose rust, loose paint and other loose detrimental foreign matter by the use of power-assisted hand tools. Power tool cleaning will not remove adherent mill scale, rust and paint. Mill scale, rust and paint are considered adherent if they cannot be removed by lifting with a dull putty knife.

3.04 COATING

A. Adequate air ventilation shall be in place prior to commencement of coating applications.
B. Coating systems shall be applied in accordance with manufacturer's instructions and using application methods best suited for obtaining full, uniform coverage and hide of surfaces to be coated.

TEMPLATE

C. Before application, coating shall be properly thinned and mixed. Refer to Manufacturer data sheets for thinning and mixing instructions.
D. Paint tools are to be used only for their intended application as identified by the manufacturer.
E. Environmental conditions
    1. Refer to Manufacturer data sheets for required environmental conditions of coating applications.
    2. Minimum Surface temperatures shall be at least 5 degrees F (15 deg C) above dew point and in a rising mode.
    3. All lighting and equipment shall be explosion proof.
    4. Atmosphere shall be free of airborne dust.
F. A stripe coat shall be brush-applied to all interior weld seams, edges, rivets, corners, and bolts.
G. Prime coat, intermediate coat, and finish coats to comply with wet and dry film thicknesses and spreading rates for each material type in accordance with SSPC-PA2 and manufacturer recommendations.
H. Coating shall overlap as necessary to mitigate thin spots, discontinuities, dry spray and defects.
I. Contractor shall pay special attention to the evaporation rates of solvents in paint. Coating surfaces within an classified space shall require continuously monitor air quality during coating application and curing time. Ventilation equipment shall run continuously during curing time.
J. All hatches, vents, and openings shall be opened for the duration of time required for curing per the Manufacturer instructions. Contractor shall provide adequate natural ventilation/forced air ventilation/heat/dehumidification as necessary to facilitate complete and timely curing.
K. Adequate curing shall be tested in accordance with ASTM D5402 or CITY-approved equal.
    1. Each rub test shall be a minimum of 25 double rubs using a MEK saturated cheesecloth with a minimum of two (2) test locations on the floor and/or bottom ring. Water Service must witness “rub” test.

3.05 COMMISSIONING

A. Steel surfaces shall be inspected prior to commissioning. During inspection, CITY’s representative, engineer, and painting contractor. Any deficiencies in the coating system will be repaired at the Contractor’s expense.
    1. When stain, dirt, or undercoats show through final coat, correct defects and cover with additional coats until coating is of uniform finish, color, appearance and coverage.
    2. Touch-up of minor damage shall be acceptable where result is not visibly different from surrounding surfaces. Where result is visibly different, either in color, sheen, or texture, recoat entire surface.
B. In the event paint has spilled, dripped or splattered, it will be removed from Surfaces accordingly. Contractor will be responsible for all cleanup and damage to any property due to painting.
C. After commissioning is completed, CITY shall set a date for a one-year inspection. Inspection will be attended by a CITY’s representative, engineer, and painting contractor. Any deficiencies in the coatings system will be repaired at the Contractor’s expense.

TEMPLATE

END OF SECTION

TEMPLATE

SECTION 15110 – PROCESS VALVES

Verbiage in Italics are project specific. They will be updated on a project-by-project basis before drawings are released for bidding purposes. (Delete this Section before release)

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers ball valves, butterfly valves, check valves, gate valves, and plug valves and their use in water treatment facilities, pump stations, and force-main sewers.

B. Contractor shall furnish all labor, materials, equipment, and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:

1. Section 00700 – General Conditions
2. Section 00800 – Supplementary Conditions
3. Section 01019 – Closeout Procedures
4. Section 01300 – Submittals
5. Section 01700 – Execution Requirements
6. Section 01735 – Pipe Service Colors
7. Section 01810 – Site Conditions
8. Section 02641 – Water Valves
9. Section 15200 – Pipe & Fittings
10. Section 16221.E – Electric Actuators for Process Valves and Gates

1.03 REFERENCES

A. American Society of Mechanical Engineers (ASME)

1. B16.34 – Valves – Flanged, Threaded, and Welding Ends
2. B16.5 – Pipe Flanges & Flanged Fittings
3. B16.10 – Face-to-Face and End-To-End Dimensions
4. B31.3 – Process Piping

B. American Water Works Association (AWWA)

1. C111/A21.11 – Rubber-Gasket Joints for Ductile-Iron Pressure Pipe Fittings
2. C507 – Ball Valves, 4 in. through 60 in. (100 mm through 1,500 mm)
3. C508 – Standard Swing Check Valves
4. C509 – Resilient Seated Gate Valves for Water Supply Service
5. C517 – Full Port Eccentric Plug Valves
6. C521 – Plastic Ball Valves
7. C522 – Rotary Cone Valves
8. C550 – Protective Interior Coatings for Valves and Hydrants

1.04 DEFINITIONS

A. The following are standard abbreviations for valves:

TEMPLATE

1. CWP: Cold working pressure
2. Non-rising – A stem that does not rise or fall with opening and closing a valve. The stem nut remains stationary
3. Rising – A stem that rises or falls with opening/closing a valve
4. Stop-Limiting Device – Limits the position/travel of the stem such that the valve tries to open/close more than the valve body allows.
5. Torque-Limiting Device – Limits how much torque is applied between the Operating Nut, Handwheel, actuator, and the stem

B. The following are working components
1. Operating Nut – For valve applications without handwheels, the operating nut is used to open/close a valve. It requires a special tool by personnel for operating the valve.
2. Stem – Threaded Screw used for lifting and lowering the gate/plug into the seat.
3. Body – The pressure containing casting of the valve.
4. Bonnet – The upper assembly of the valve. It is typically flanged to the valve body and used to seal and prevent leakage from the stem.
5. Fasteners – Studded bolts, Cap Screws, Nuts, etc. used to fasten and or seal any pressure containing components.
6. Disc – The isolating component of the butterfly valve, and check valve that rests on the seat in the fully closed position.
7. Seats – The surface on which the disc or gate sits for isolating and closing a valve
8. Handwheel – Used to open/close a valve by rotating the axis of the stem
9. Bevel Gear – An operator that transmits the rotation of the axis of the stem by 90 degrees such that the Operator handwheel axis is parallel to grade.

C. Material Descriptions
1. EPDM: Ethylene-propylene-diene terpolymer rubber
2. HFW: High-Frequency Weld
3. NBR: Acrylonitrile-butadiene rubber
4. PTFE: Polytetrafluoroethylene plastic
5. RF: Raised Face

1.05 SUBMITTALS

A. Submit as specified in Section 01300 – Submittals and Submit as specified in Section 01019 – Closeout Procedures.

B. Submit manufacturer's literature describing components to be provided, giving manufacturer's name, product component name, and line number for each component.

C. Technical Submittals Include, but not limited to the following:
1. Catalog data
2. General Arrangements
3. Assembly and disassembly or repair instructions (includes Parts List)
4. Fabrication Drawings
5. Detail Drawings
6. Schematic and Wiring Diagrams
7. Installation Drawings
8. Mounting Assembly Diagram
9. Calculations for actuator torque

TEMPLATE

10. Proof of design tests in accordance with AWWA C504, Section 5 – Verification. Tests shall include the following:
    a. Hydrostatic test
    b. Actuator proof of design testing
    c. Test valve rehabilitation
    d. Certification for proof of design.
11. Performance Data
12. Instruction books and Operation and Maintenance manuals
13. Spare parts lists

D. Quality Assurance Submittals
    1. Provide manufacturer's certification that products to be used comply with specified requirements and are suitable for intended application.

1.06 QUALITY ASSURANCE

A. Qualifications
    1. Equipment specified herein shall be the product of a manufacturer who is of proven ability and has at least five (5) years of experience in the production of such equipment in sizes like those required on this project. The manufacturer shall have completed and made ready for operation at least twenty-five separate installations in the United States that have been in operation for at least five (5) years.

B. Sourcing
    1. If more than one (1) process valve is procured via this section, process valves shall be provided from a single manufacturer.

C. Quality Assurance shall follow ASME Compliance for Ferrous Valves: ASME B16.10 and ASME B16.34 for dimension and design criteria.

1.07 DELIVERY, STORAGE, AND HANDLING

A. All components and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment tools, and methods used in unloading, reloading, hauling, and shipping shall be such that components are not damaged.

B. All valves will be packaged to prevent rattling of valve components and secure in a closed or open position.

C. For equipment exceeding 50 pounds, lifting eyes and lifting lugs shall be provided to allow for installation.

D. Boxes and packages shall be properly marked to show its net and total weight, contents within the box and/or package.

E. Items shall be marked as identified in delivery schedule and as shown in Submittals and include a complete list and bills of materials with each shipment. Each item requiring assembly shall be properly tagged and marked.

F. If items are shipped separately, they shall be tagged and indicated as such to facilitate proper assembly on-site.

1.08 WARRANTY

A. Equipment manufacturer shall provide a warranty for all items furnished in accordance with Sections 00700 and 00800. Warranty shall run concurrently with the Contractor's warranty and commence at final completion and CITY's acceptance.

TEMPLATE

B. Warranty shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate equipment design, improper assembly or erection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the manufacturer.

PART 2 – PRODUCTS

2.01 GENERAL

A. Intra-facility valves shall be compliant for ASME B31.3 piping. The first discharge valve used to isolate pumps from the transmission main shall be suitable for ASME B31.4 piping system.
B. Valve size selection shall be the same range as specified in Section 15200 – Pipe and Fittings.
C. Isolation Valve sizes shall be at least the Nominal Pipe Size of the mated piping system. Reducers upstream/downstream of valve are not allowed. (i.e. 6” NPS valve on a 10” NPS piping segment)
D. Specialty valves not listed herein shall be submitted to the City for review and approval (i.e. knife gate valves)

2.02 DESIGN

A. Type(s)
   1. Valves shall be of the following type(s):
      a. Ball Valves larger than 4” NPS shall be the AWWA C507 trunnion-mounted, full port type. Ball Valves 4” NPS and smaller shall be a ASME B16.10 reduced-port floating-ball type.
      b. Check Valves shall be of the AWWA C508 swing check type with an outside-lever. If the space is limited, a lug check valve type shall be used.
      c. Cone Valves shall be of the AWWA C522 trunnion-mounted full-port type.
      d. Gate Valves shall be AWWA C509 Non-rising, Resilient-Seated type.
      e. Globe Valves shall be T-Pattern type.
      f. Plug Valves larger than 4” shall be the AWWA C517 full-port eccentric type. Plug Valves 4” NPS and smaller shall be a ASME B16.10 reduced-port plug type.
   2. Valves requiring double isolation shall be of the following types.
      a. Double Block & Bleed Plug Valve
      b. Expanding Gate Valve

TEMPLATE

B. Function(s)
   1. Valves shall be selected based on the primary function (or primary application. The second or third preference is an option if first or second preferences are not available by the manufacturer.

Service	Order of Preference	Isolation (6" NPS and larger)	Isolation (4" NPS and smaller)	One-way Flow	Throttling
Water (Process)	1	Refer to Section 02641 - Water Valves	Ball Valve	Swing Check Valve	Ball Valve
	2		Gate Valve	Lug Check Valve	Cone Valve
	3				Globe Valve
Water (Transmission)	1	Refer to Section 02641 - Water Valves	Gate Valve	Refer to Section 02641 - Water Valves	Ball Valve
	2		Ball Valve		Cone Valve
	3				Globe Valve
Corrosive	1	Double Block & Bleed Plug Valve	Two (2) AWWA C521 Ball Valves in Series	Swing Check Valve	Ball Valve
	2	Expanding Gate Valve	Two (2) Plug Valves in Series	Lug Check Valve	Cone Valve
	3	Two (2) Gate Valves in Series			Globe Valve
Slurry	1	Plug Valve	Ball Valve	Swing Check Valve	Ball Valve
	2	Ball Valve	Plug Valve	Lug Check Valve	Cone Valve
	3	Gate Valve			Globe Valve

C. Feature(s)
   1. Valve(s) shall match the pipe service color, refer to Sectio 01735 – Pipe Service Colors.
   2. Valve(s) with larger than 4” shall have a bolted bonnet.
   3. Water valves (Process or Transmission) shall meet the requirements of AWWA C550 – Protective Interior Coatings for Valves and Hydrants.
D. Site Conditions
   1. Refer to Section 01810 – Project Design Criteria
E. Process & Service Conditions
   1. Refer to Form F-1 – Project Design Specifications

TEMPLATE

2.03 MATERIALS OF CONSTRUCTION

A. Services

	Body	End Connections	Gaskets
Ammonia	Stainless Steel ASTM A182 TP 316	HFW	EPDM
Concentrate/Reject/Brine	Stainless Steel ASTM A182 TP 316	RF Flanged	ASTM A182 TP316
Carbon Dioxide	Carbon Steel ASTM A216 Gr. WCB	HFW	EPDM
Chlorine (Gas)	Carbon Steel ASTM A216 Gr. WCB	HFW	EPDM
Chlorine (Solution)	PVC ASTM D1784 12454	RF Flanged	ASTM F477 High-Head Application
Ferric Sulfate	HDPE ASTM D3350 PE4710	Butt Fusion	EPDM
Finished Water	Ductile Iron (refer to Section 02641 – Water Valves)		
Lime Slurry	Stainless Steel ASTM A182 TP 316	RF Flanged	ASTM A182 TP316
Lime Residual	Stainless Steel ASTM A182 TP 316	RF Flanged	ASTM A182 TP316
Natural Gas	ASTM A216 Gr. WCB	RF Flanged	ASTM C509 NBR
Powdered Activated Carbon	Stainless Steel ASTM A182 TP 316	RF Flanged	ASTM A182 TP316
Sodium Bisulfite	HDPE ASTM D3350 PE4710	Butt Fusion	EPDM
Sodium Fluoride	Stainless Steel, ASTM A182 TP 316	RF Flanged	ASTM A182 TP316
Sodium Hypochlorite	HDPE ASTM D3350 PE4710	Butt Fusion	EPDM
Potassium Permanganate	Stainless Steel ASTM A182 TP 316	RF Flanged	ASTM A182 TP316

B. Coatings

1. All valves shall be in accordance with Section 01735 – Pipe Service Colors
   a. Carbon Steel valves and Stainless Steel valves shall be externally coated with a primer and coated in the pipe service color
   b. PVC valves shall use a resin matching the Pipe Service.
   c. HDPE valves shall use an operator/handle matching the color of the pipe service.
   d. For Ductile Iron Valves, refer to Section 02641 – Water Valves.

C. Contractor shall submit gasket materials for all pipe services not listed in Contract Documents.

2.04 APPROVED MANUFACTURERS

A. Ball Valves

TEMPLATE

1. Conbraco Industries
2. Powell
3. Hayward Plastic Products
4. Nibco
5. Spears Manufacturing Co
6. CITY-Approved Equal

B. Butterfly Valves
1. M&H
2. DeZurik
3. VSI
4. CITY-Approved Equal

C. Check Valves
1. Kennedy Valve
2. Valmatic
3. CITY-Approved Equal

D. Gate Valves
1. Clow
2. Mueller
3. M&H
4. AVK
5. EJ
6. DeZurik
7. ITT Industries
8. Wey Valve
9. CITY-Approved Equal

E. Plug Valves
1. Contractor shall submit to City for approval.

2.05 ACTUATION

A. Manual Operators
1. If piping is arranged in a manner such that the face of the bonnet is pointed towards Operations Personnel, a handwheel operator may be used if it is within OSHA's acceptable ergonomic values
2. Valves 8" NPS and larger shall use a bevel gear operator if valve stem is in a vertical orientation in piping system

B. For Electric actuation, Refer to Section 16221.E – Electric Actuators

PART 3 – EXECUTION

END OF SECTION

TEMPLATE

SECTION 15200 – Pipe & Fittings

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers stainless pipe and fittings for wastewater facilities.

B. Contractor shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:
   1. Section 15200.75PVC – PVC Pipe & Fittings
   2. Section 15200.250CPVC – CPVC Pipe & Fittings
   3. Section 15200.150CS - ANSI 150 Carbon Steel Pipe and Fittings
   4. Section 15200.150DI – Ductile Iron Pipe and Fittings
   5. Section 15200.150SS – ANSI 150 Stainless Steel Pipe and Fittings

1.03 REFERENCES

A. American Society of Mechanical Engineers (ASME)
   1. B31.1 – Power Piping
   2. B31.3 – Process Piping
   3. B31.8 – Gas Transmission & Distribution Piping System

B. American Water Works Association
   1. M9 – Concrete Pressure Pipe
   2. M11 – Steel Pipe – A Guide for Design and Installation
   3. M23 – PVC Pipe – Design and Installation

C. International Code Council (ICC)
   1. IBC 2018 – International Building Code

D. National Fire Protection Association (NFPA)
   1. 15 – Standard for Water Spray Fixed Systems for Fire Protection

E. Plastics Pipe Institute
   1. Handbook of Polyethylene Pipe

1.04 SUBMITTALS

A. Submit as specified in Section 01019 – Closeout Procedures.

B. Submit manufacturer's literature describing components to be provided, giving manufacturer's name, product component name, and line number for each component.

C. Technical Submittals Include, but not limited to the following:
   1. Catalog data
   2. Equipment P&IDs
   3. General Arrangements
   4. Assembly and disassembly or repair instructions

5. Fabrication Drawings
6. Detail Drawings
7. Single Line Diagram
8. Schematic and Wiring Diagrams
9. Installation Drawings
10. Mounting Assembly Diagram
11. Performance Data
12. Instruction books and Operation and Maintenance manuals
13. Spare parts lists

D. Quality Assurance Submittals
   1. Provide manufacturer's certification that products to be used comply with specified requirements and are suitable for intended application.
   2. Weld Procedures

1.05 QUALITY ASSURANCE

A. Qualifications
   1. Equipment specified herein shall be the product of a reputable and qualified manufacturer who is of proven ability and has at least five (5) years of experience in the production of such equipment in sizes similar to those required on this project. The manufacturer shall have completed and made ready for operation at least twenty-five separate installations in the United States that have been in operation for at least five (5) years.
   2. Manufacturer shall be listed by recognized building code authority including the International conference of Building Officials.

B. Identification – All pipe and fittings shall be labeled and provided with an appropriate Material Test Report (MTR). Pipe and fitting shall be properly labeled prior to shipment.

C. Inspections and Testing
   1. Inspections shall be performed on field welds, fused joints, and mechanical joints as applicable per IBC 2018. NDE inspection services of all welds shall be provided by 3rd party and will be procured by CITY. Contractor shall provide early and timely fashion for welds performed within project schedule such that inspection services may be procured.

D. Welding Procedures
   1. Welding Procedure Specifications (WPS) shall be submitted in accordance with ASME and AWS requirements.
      a. WPS shall be submitted for each type of welded joint (both prequalified and qualified by testing)
      b. All WPS must be written using a referenced Procedure Qualification Record (PQR) that applies to the welded joint
      c. For any shop drawings that refer to welding procedures specifications, WPS shall be submitted with applicable shop drawing.
   2. Inspection of all welded fabrication shall be done by an AWS Certified Welding Inspector.
   3. Fabrication inspections, erection inspection, and verification inspections shall be performed by an independent testing and inspecting agency retained by CITY. Alternatively, the fabricator may submit valid plant certification by a recognized certifying agency, e.g. AISC. Such certification shall be not more than two (2) years old.
      a. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

b. MTCs, WPS, and PQR shall be made available to Inspector at request.
c. Inspections shall occur in accordance with ASME and AWS.
d. A minimum of one (1) week notice shall be given to CITY prior to shop fabrication, field fabrication, and field erection.

4. Rejection of any portion of weld inspected on partial length basis shall require inspection of the stated length on each side of the defect.
5. Correct deficiencies in Work that test reports and inspections indicate does not comply with Contract Documents.
6. Such inspections and tests will not relieve Contractor of responsibility for providing materials and fabrication procedures to meet specified requirements.
7. Promptly remove and replace materials or fabricated components that do not comply.
8. Design of Piping and Connections:
   a. Details shown are typical; similar details apply to similar conditions, unless otherwise indicated.
   b. Contractor shall be responsible for field verifying all dimensions as required for completion of Work.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Prior to shipment, Supplier shall give notice to Contractor and CITY at least 48 hours in advance.
B. All components and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment tools, and methods used in unloading, reloading, hauling, and shipping shall be such that components are not damaged.
C. For materials exceeding 50 pounds, lifting eyes and lifting lugs shall be provided to allow for installation.
D. Boxes and packages shall be properly marked to show its net and total weight, contents within the box and/or package.
E. Items shall be marked as identified in delivery schedule and as shown in Submittals and include a complete list and bills of materials with each shipment. Each item requiring assembly shall be properly tagged and marked.
F. If items are shipped separately, they shall be tagged and indicated as such to facilitate proper assembly on-site.
G. Piping of dissimilar materials shall be stored apart from each other.

1.07 WARRANTY

A. Equipment manufacturer shall provide a warranty for all items furnished in accordance with Section 01740. Warranty shall run concurrently with the Contractor's warranty and commence at final completion and CITY's acceptance.
B. Warranty shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate equipment design, improper assembly or erection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the manufacturer.

PART 2 – PRODUCTS

2.01 General

A. All piping installations shall adhere to the applicable design code(s).

1. Piping within water facilities and wastewater facilities shall be designed per AWWA M11 unless otherwise designated. Contractor shall provide a pipe stress analysis upon request by City.
    a. Utility piping shall be considered process piping and designed per ASME B31.3.
    b. Potable, Non-Potable, solution lines and drain lines shall be designed per AWWA M23.
    c. Fire Protection piping shall be designed and installed per NFPA 15.

B. The acceptable nominal pipe sizes (NPS) for all piping are as follows unless otherwise listed in the material specification: ½", ¾", 1", 1-1/2", 2", 3", 4", 6", 8", 10", 12", 14", 16", 18", 20", and 24". Additionally, NPS for underground piping may also be 36", 42", 48", 54", 60", 72", and 84".

C. Piping for sewer flow shall only be used if all following conditions have been met.
1. There is not an existing rectangular channel, flat-bottomed channel, or flat-bottomed with sloping sides channel used to convey influent from storm, sanitary, or combined sewer to reservoirs.
2. Piping has the potential to be surcharged during rainfall events.
3. Sewer flow is outside of the facility fence.
4. Piping is being installed in an existing facility where use of a channel is not feasible.

D. If the service is open channel flow from a sewer and inside of a building, external coating of carbon steel pipe is not considered adequate corrosive resistance.

E. Joining of two different materials is not permitted unless they have been electrically isolated or are nonconductive.

F. Flanges, mechanical joints, and bell and gaskets may only be used below finished grade if the fittings will not come in direct contact with soil and are joining the same material. (i.e. DI to DI, HDPE to HDPE, PVC to PVC, etc.)

2.02 Abbreviations

A. Pipe Services
1. CSL – Chlorine Solution Line
2. EFFL – Effluent
3. FG – Fuel Gas
4. GRSC – Grit/Screening
5. HPW – Hot Potable Water
6. INFL – Influent
7. NPW – Non-Potable Water
8. PD – Process Drain
9. POT – Potable Water

B. Pipe Materials
1. CI – Cast Iron
2. CPVC – Chlorinated Polyvinyl Chloride
3. CS – Carbon Steel
4. DI – Ductile Iron
5. GLS – Glass Lined Steel
6. HDPE – High-Density Polyethylene Pipe
7. PVC – Polyvinyl Chloride
8. SS – Stainless Steel

2.03 Material Selection

A. City shall indicate preferred materials using the following abbreviations; PI – Preferred Indicative, I-Indicative, and F-Fixed.

B. Pipe Service Table (Order of preference with 1 being highest ranked)

Abbreviation	CS[Note1]	SS	HDPE	PVC	CPVC	GLS	CI	DI
CSL					1			
EFFL		1						1[Note 3]
INFL		1						1[Note 3]
FG	2	1						
GRSC			1			2		
HPW				2	1			
NPW			2[Note2]	2	1			
PD				2	1			
POT				2	1			

1. Carbon Steel shall require an epoxy coating on piping and field-applied coatings to all fittings.
2. HDPE is acceptable for use; however, precautions must be taken to protect from excess UV-radiation.
3. Only applicable when piping is embedded within an environmental engineering concrete structure and/or buried.

C. For Carbon Steel Requirements, refer to Section 15200.150CS.
D. For Stainless steel requirements, refer to Section 15200.150SS.
E. For PVC requirements, refer to Section 15200.75PVC.
F. For CPVC requirements, refer to Section 15200.250CPVC.

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 15200.75PVC – PVC Pipe & Fittings

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers pressure-rated PVC pipe and fittings up to 75 psi.

B. Design-Builder shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:
   1. Section 01019 – Closeout Procedures
   2. Section 01740 – Warranty
   3. Section 01810 – Project Design Criteria

1.03 REFERENCES

A. American Society of Testing and Materials (ASTM)
   1. D1784 – Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
   2. D1785 – Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
   3. D2466 – Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
   4. D2467 – Standard Specification for Socket-Type Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
   5. F477 – Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

B. American Water Works Association (AWWA)
   1. C900 – Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 in. through 12 in. (100 mm through 300 mm), for Water Distribution
   2. C907 – Polyvinyl Chloride (PVC) Pressure Fittings for Water – 4 in. through 8 in. (100 mm through 200 mm)
   3. C908 – PVC Self-Tapping Saddle Tees for Use on PVC Pipe

C. Plastics Pipe Institute (PPI)
   1. TR-4 – HDB/HDS/SDB/PDB/MRS Listed Materials

1.04 SUBMITTALS

A. Refer to Section 15200 – Pipe and Fittings.

1.05 QUALITY ASSURANCE

A. Refer to Section 15200 – Pipe and Fittings.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Refer to Section 15200 – Pipe and Fittings.

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1.07 WARRANTY

A. Refer to Section 15200 – Pipe and Fittings.

PART 2 – PRODUCTS

2.01 General

A. The acceptable nominal pipe sizes (NPS) for use are as follows: ¾", 1", 1-1/2", 2", 3", 4", 6", and 8".
B. Nominal Pipe Sizes (NPS) larger than 8" are not allowed.
C. Pipe Connections in order or preference
    1. Bell & Spigot – 4" and larger
    2. Sockets– 3" and smaller
    3. Threaded – 1" and smaller
D. For Nominal Pipe Sizes (NPS) ½" and ¾", stainless steel tubing may be utilized if for connecting to remote-mounted instrumentation.
E. PVC piping shall not have fitting to fitting installation. A pipe pup shall be installed between fittings not less than 12 inches for 3" NPS and less. For Fittings greater than 6" NPS, the pipe pup shall be a minimum of 3 pipe diameters in length. See examples as follows.
    1. 4" NPS – 12" Pipe Pup Length
    2. 6" NPS – 18" Pipe Pup Length
    3. 8" NPS – 24" Pipe Pup Length
F. Multistep Reducer bushings may be used and cored out in accordance with ASTM D2466 and ASTM D2467.

2.02 Abbreviations

A. Pipe
    1. DIPS – Ductile Iron Pipe Size
    2. IPS – Iron Pipe Size
    3. NPS – Nominal Pipe Size
    4. OD – Outside Diameter
    5. SDR – Standard Diametric Ratio
    6. WT – Wall Thickness
B. Elbow Types
    1. LR – Long Radius
    2. 3D – 3D Bend Radius
    3. 5D – 5D Bend Radius
    4. SR – Short Radius
C. End Types
    1. BE – Beveled End
    2. BBE – Beveled Both Ends
    3. B&G – Bell & Spigot
    4. PE – Plain End
    5. PBE – Plain Both Ends
    6. FTE – Female Threaded End
    7. MTE – Male Threaded End
    8. TBE – Threaded Both Ends
D. Flange Types
    1. FF – Flat Face
    2. RF – Raised Face

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3. RTJ – Ring Type Joint
4. WN – Weld Neck

E. Pipe Manufacturing Types
1. ERW – Electric Resistance Welded
2. HFW – High Frequency Weld
3. SMLS – Seamless

F. Reducer Types
1. CONC – Concentric
2. ECC – Eccentric

G. Tee Types
1. RED – Reduced
2. STD – Standard

2.03 Process Conditions

A. For all other design criteria not listed herein, refer to Section 01810 – Project Design Criteria.
1. Service: Potable Water
2. Ambient Environment: Potential H_2S Environment
3. Temperature(s)
a. Low Temperature: -20°F
b. High Temperature: 102°F
4. Installation Location: Aboveground
5. Maximum Allowable Operating Pressure: 75 psi @ 102 °F
6. Corrosion Allowance (A): 0.00 in.
7. Safety Factor: 2.5

2.04 Components

A. The following materials may be used for the process conditions listed. Listed Sizes are the size of the header.

B. Pipe
1. ¾” – 2”
a. PIPE, XX" NPS, SDR17, PE, ASTM D2241, ASTM D1784 12454
2. 3” – 3”
a. PIPE, XX" NPS, SDR17, PE, ASTM D2241, ASTM D1784 12454
3. 4” – 8”
a. PIPE, XX" NPS, SDR18, PE, AWWA C900, ASTM D1784 12454

C. Pipe Fittings
1. ¾” – 1”
a. MALE ADAPTER, XX" NPS, SDR17, SPIGOT X MTE, ASTM D2466, ASTM D1784 12454
b. FEMALE ADAPTER, XX" NPS, SDR17, SPIGOT X FTE, ASTM D2466, ASTM D1784 12454
2. 3/4” – 2”
a. PLUG, HEX HEAD, XX" NPS, SDR17, MTE, ASTM D2466, ASTM D1784 12454
b. CAP, XX" NPS, SDR17, FTE, ASTM D2466, ASTM D1784 12454
3. 1” – 3”
a. ELBOW, XX" NPS, SCH 80, SOCKET x SPIGOT, ASTM D2466, ASTM D1784 12454
b. ELBOW, REDUCED, XX" NPS, SCH 80, SOCKET x SPIGOT, ASTM D2466, ASTM D1784 12454
c. TEE, STRAIGHT, XX" NPS, SCH 80, SOCKET, ASTM D2466, ASTM D1784 12454
d. TEE, WYE, XX" x XX" NPS, SCH 80, SOCKET, ASTM D2466, ASTM D1784 12454

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e. BUSHING, REDUCED, XX" x XX" NPS, SCH 80, SOCKET, ASTM D2466, ASTM D1784 12454

4. 3" – 3"
   a. PLUG, HEX HEAD, XX" NPS, SCH 80, MTE, ASTM D2466, ASTM D1784 12454
   b. CAP, XX" NPS, SCH 80, FTE, ASTM D2466, ASTM D1784 12454
5. 4" – 8"
   a. COUPLING, LINE, XX" NPS, SDR18, B&S, AWWA C907, ASTM D1784 12454
   b. ELBOW, 45 DEG, XX" NPS, SDR18, B&S, AWWA C907, ASTM D1784 12454
   c. ELBOW, 90 DEG, XX" NPS, SDR18, B&S, AWWA C907, ASTM D1784 12454
   d. TEE, STRAIGHT, XX" NPS, SDR18, B&S, AWWA C907, ASTM D1784 12454
   e. TEE, WYE, XX" NPS, SDR18, B&S, AWWA C907, ASTM D1784 12454

D. Gaskets
1. 3" – 8"
   a. GASKET, XX" NPS, SDR17, B&S, AWWA C907, ASTM F477 HIGH-HEAD APPLICATION

E. Branch Reinforcements
1. 3" – 8"
   a. TEE, SADDLE, XX" x XX" NPS, SOCKET, AWWA C908, ASTM D1784 12454, SEALING GASKET: ASTM F477, INSTALLATION TYPE: CLAMP ON

2.05 Branch Reinforcement

A. Branch Table Abbreviations are as follows
1. T – Standard Tee
2. TBR – Tee with Reduced Bushing
3. TBR2 – Tee with Multistep Reduced Bushing
4. DNU – Do Not Use
   a. For any header size and branch size labeled as DNU, designer shall not have any branch piped directly to the header size listed.

B. For the preferred branch connections, refer to the branch table listed herein.

Branch Size (NPS)	8	6	4	3	2	1.5	1
8	T						
6	TPRB	T					
4	DNU	TPRB2	T				
3	DNU	DNU	TPRB	T			
2	ST	DNU	ST	TPRB	T		
1.5	ST	ST	ST	ST	TPRB	T	
1	ST	ST	ST	ST	ST	TPRB	T
0.75	ST	ST	ST	ST	ST	ST	TPRB
	Header size (NPS)						

PART 3 – EXECUTION (NOT USED)

END OF SECTION

TEMPLATE

SECTION 15200.150CS – Carbon Steel Pipe & Fittings

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers carbon steel pipe and fittings for ANSI Class 150 systems.

B. Design-Builder shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:
   1. Section 01019 – Closeout Procedures
   2. Section 01740 – Warranty
   3. Section 01810 – Project Design Criteria

1.03 REFERENCES

A. American Society of Mechanical Engineers (ASME)
   1. B1.1 – Unified Inch Screw Threads
   2. B16.5 – Pipe Flanges and Flanged Fittings
   3. B16.9 – Factory-Made Wrought Buttwelding Fittings
   4. B16.11 – Forged Fittings, Socket-Welding and Threaded
   5. B16.20 – Metallic Gaskets for Pipe Flanges
   6. B31.3 – Process Piping
   7. B36.10M – Welded and Seamless Wrought Steel Pipe

B. American Society of Testing and Materials (ASTM)
   1. A53 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
   2. A105 – Standard Specification for Carbon Steel Forgings for Piping Applications
   3. A106 – Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service
   4. A193/A193M – Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High-Pressure Service and Other Special Purpose Applications
   5. A194/A194M – Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
   6. A234 – Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service
   7. A307 – Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength
   8. ASTM C509 – Standard Specification for Elastomeric Cellular Preformed Gasket and Sealing Material

C. American Petroleum Institute
   1. 5L – Line Pipe

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D. Manufacturer's Standardization Society
   1. SP-97 – Integrally Reinforced Forced Branch Outlet Fittings: Socket Welding, Threaded, and Buttwelding Ends.

1.04 SUBMITTALS
A. Refer to Section 15200 – Pipe and Fittings.

1.05 QUALITY ASSURANCE
A. Refer to Section 15200 – Pipe and Fittings.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Refer to Section 15200 – Pipe and Fittings

1.07 WARRANTY
A. Refer to Section 15200 – Pipe and Fittings.

PART 2 – PRODUCTS
2.01 General
A. The acceptable nominal pipe sizes (NPS) for use are as follows: ½", ¾", 1", 1-1/2", 2", 3", 4", 6", 8", 10", 12", 14", 16", 18", 20", and 24".
B. Nominal Pipe Sizes (NPS) larger than 24" are not allowed.
C. Pipe Connections:
   1. Butt Welds – 3" and larger
   2. Socket Welds – 1-1/2" to 2"
   3. Threaded – 1" and smaller
D. For Nominal Pipe Sizes (NPS) ½" and ¾", stainless steel tubing may be utilized if for connecting to remote-mounted instrumentation.
E. Dielectric unions must be used to isolate dissimilar pipe materials.
F. Reduced fittings shall not reduce any more than two (2) nominal pipe sizes.
   1. Acceptable examples: 12" x 10", 12" x 8", 10" x 8", 10" x 6"
   2. Non-acceptable examples: 12" x 6", 12" x 4", 10" x 4", 10" x 3"
G. If a reduced fitting is used with reducer, then each component (fitting & reducer may not reduce more than four (4) nominal pipe sizes in total.
   1. Acceptable example: 12" x 12" x 8" Reduced Tee with 8" x 4" Reducer
   2. Non-acceptable example: 14" x 14" x 8" Reduced Tee with 8" x 4" Reducer

2.02 Abbreviations
A. Elbow Types
   1. LR – Long Radius
   2. 3D – 3D Bend Radius
   3. 5D – 5D Bend Radius
   4. SR – Short Radius
B. End Types
   1. BE – Beveled End
   2. BBE – Beveled Both Ends
   3. PBE – Plain Both Ends
   4. FTE – Female Threaded End
   5. MTE – Male Threaded End

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6. SWE – Socket Welded End
7. TBE – Threaded Both Ends

C. Flange Types
1. FF – Full Face
2. RF – Raised Face
3. RTJ – Ring Type Joint
4. WN – Weld Neck

D. Pipe Manufacturing Types
1. ERW – Electric Resistance Welded
2. HFW – High Frequency Weld
3. SMLS – Seamless

E. Reducer Types
1. CONC – Concentric
2. ECC – Eccentric

F. Tee Types
1. RED – Reduced
2. STD – Standard

2.03 Process Conditions

A. For all other design criteria not listed herein, refer to Section 01810 – Project Design Criteria.
1. Service:
a. Fuel Gas piping alternative (API 5L PSL2, Grade B, Seamless) will apply to fuel gas service only)
b. Engineer approved services for general use
2. Ambient Environment: Potential H_2S exposure
3. Installation Location: Aboveground
4. Class: ANSI Class 150
5. Corrosion Allowance (A): 0.03125 in.
6. Design Factor: 0.72

2.04 Components

A. The following materials may be used for the process conditions listed. Listed Sizes are the size of the header.

B. Pipe – General Use:
1. 1/2” – 1”
a. PIPE, XX" NPS, SMLS, SCH 80, TBE, ASME B36.10M, ASTM A106 GRADE B
2. 1-1/2” – 2”
a. PIPE, XX" NPS, SMLS, SCH 80, SWE, ASME B36.10M, ASTM A106 GRADE B
3. 3” – 24”
a. PIPE, XX" NPS, SCH 40, BBE, ASME B36.10M, ASTM A106 GRADE B or A53 GRADE B, ERW

C. Pipe Fittings
1. ≤ 1”
a. BUSHING, XX" x XX" NPS CL3000, MTE X FTE, ASME B16.11, ASTM A105, THREADS PER ASME B1.20.1
b. ELBOW, XX" NPS, CL3000, MTE x MTE, ASME B16.11, ASTM A105, THREADS PER ASME B1.20.1

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c. ELBOW, STREET, XX" NPS, CL3000, MTE x FTE, ASME B16.11, ASTM A105, THREADS PER ASME B1.20.1
d. PIPE NIPPLE, XX" NPS x 6" LENGTH, SMLS, SCH 80, TBE, ASME B36.10, ASTM A106 GRADE B, THREADS PER ASME B1.20.1
e. TEE, RED, XX" x XX" x XX" NPS, CL3000, FTE x FTE x FTE, ASME B16.11, ASTM A105, THREADS PER ASME B1.20.1
f. TEE, STD, XX" NPS, CL3000, FTE x FTE x FTE, ASME B16.11, ASTM A105, THREADS PER ASME B1.20.1
g. UNION, XX" x XX" NPS CL3000, FTE X FTE, ASME B16.11, ASTM A105, THREADS PER ASME B1.20.1

2. 1" – 2"
a. COUPLING, XX" x XX" NPS CL3000, SWE X FTE, ASME B16.11, ASTM A105, THREADS PER ASME B1.20.1
b. COUPLING, XX" x XX" NPS CL3000, SWE X SWE, ASME B16.11, ASTM A105
c. ELBOW, XX" NPS, CL3000, SWE x SWE, ASME B16.11, A105
d. PIPE NIPPLE, XX" NPS x 6" LENGTH, SMLS, SCH 80, SWE, ASME B36.10, ASTM A106 GRADE B
e. TEE, RED, XX" x XX" x XX" NPS, CL3000, SWE x SWE, ASME B16.11, ASTM A105
f. TEE, STD, XX" NPS, CL3000, SWE x SWE, ASME B16.11, ASTM A105

3. 2-1/2" – 24"
a. ELBOW, LR, XX" NPS, SMLS, SCH 40, BBE, ASME B16.9, ASTM A234 WPB
b. REDUCER, CONC, XX" NPS, SMLS, SCH 40, BBE, ASME B16.9, ASTM A234 WPB
c. REDUCER, ECC, XX" NPS, SMLS, SCH 40, BBE, ASME B16.9, ASTM A234 WPB
d. TEE, RED, XX" x XX" x XX" NPS, SMLS, SCH 40, BBE, ASME B16.9, ASTM A234 WPB
e. TEE, STD, XX" NPS, SMLS, SCH 40, BBE, ASME B16.9, ASTM A234 WPB

D. Flanges, Gaskets, and Bolts
1. 3" – 24"
a. FLANGE, WN, XX" NPS, ANSI CL150, SCH 40, RF x BE, ASME B16.5, ASTM A105
b. GASKET, NITRILE, XX" NPS, ANSI CL150, SCH 10S, RF, ASME B16.20, ASTM C509
c. BOLTS, STUD, XX" DIAM. x XX" LENGTH, ANSI CL150, ASME B1.1, ASTM A193 GRADE B8 WITH TWO (2) HEAVY HEX ASTM A194 GRADE 8 NUTS PER FLANGE (1 SET = XX BOLTS)
d. CAP SCREWS, HEX HEAD, XX" DIAM. x XX" LENGTH, ANSI CL150, ASME B1.1, ASTM A193 GRADE B8 WITH TWO (2) HEAVY HEX NUTS PER FLANGE

E. Branch Reinforcements
1. 3" – 24"
a. ELBOLET, XX" x XX" NPS, SMLS, CL3000, BE X BE, MSS SP-97, ASTM A105
b. ELBOLET, XX" x XX" NPS, SMLS, CL3000, BE X SWE, MSS SP-97, ASTM A105
c. ELBOLET, XX" x XX" NPS, SMLS, CL3000, BE X THD, MSS SP-97, ASTM A105
d. SOCKOLET, XX" x XX" NPS, SMLS, CL3000, BE X SWE, MSS SP-97, ASTM A105
e. THREADOLET, XX" x XX" NPS, SMLS, CL3000, BE X THD, MSS SP-97, ASTM A105, THREADS PER ASME B1.20.1
f. WELDOLET, XX" x XX" NPS, SMLS, CL3000, BE X BE, MSS SP-97, ASTM A105

2.05 Bolts

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A. The Diameter x Length of Stud Bolts are as follows.
   1. 1” NPS: 1/2” Ø x 7” Length
   2. 1-1/2” NPS: 1/2” Ø x 7-1/2” Length
   3. 2” NPS: 5/8” Ø x 8-1/4” Length
   4. 3” NPS: 5/8” Ø x 8-3/4” Length
   5. 4” NPS: 5/8” Ø x 9-1/4” Length
   6. 6” NPS: 3/4” Ø x 10-7/8” Length
   7. 8” NPS: 3/4” Ø x 11-7/8” Length
   8. 10” NPS: 7/8” Ø x 12-3/8” Length
   9. 12” NPS: 7/8” Ø x 13-3/8” Length
   10. 14” NPS: 1” Ø x 15” Length
   11. 16” NPS: 1” Ø x 15” Length
   12. 18” NPS: 1-1/8” Ø x 16-1/2” Length
   13. 20” NPS: 1-1/8” Ø x 16-7/8” Length
   14. 24” NPS: 1-1/4” Ø x 18” Length

B. One Set of Bolts shall be equivalent to the number of bolts required to properly bolt and torque one (1) ANSI 150 flanged set.

NPS	ANSI 150 BOLT QTY.	NPS	ANSI 150 BOLT QTY.
1”	4	10”	12
1-1/2”	4	12”	12
2”	4	14”	12
3”	4	16”	16
4”	8	18”	16
6”	8	20”	20
8”	8	24”	20

2.06 Branch Reinforcement

A. Branch Table Abbreviations are as follows
   1. T – Standard Tee
   2. RT – Reduced Tee
   3. RTR – Reduced Tee with Reducer
   4. W – Weldolet
   5. S – Sockolet
   6. DNU – Do Not Use
      a. For any header size and branch size labeled as DNU, designer shall not have any branch piped directly to the header size listed.

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B. For the preferred branch connections, refer to the branch table listed herein.

Branch Size (NPS)	Header Size (NPS)													
	24	20	18	16	14	12	10	8	6	4	3	2	1.5	1
24	T													
20	RT	T												
18	RT	RT	T											
16	RT	RT	RT	T										
14	RTR	RT	RT	RT	T									
12	RTR	RTR	RT	RT	RT	T								
10	RTR	RTR	RTR	RT	RT	RT	T							
8	RTR	RTR	RTR	RTR	RT	RT	RT	T						
6	W	W	W	W	RTR	RT	RT	RT	T					
4	W	W	W	W	W	RTR	RTR	RT	RT	T				
3	W	W	W	W	W	W	W	RTR	RT	RT	T			
2	S	S	S	S	S	S	S	S	RTR	RT	RT	T		
1.5	S	S	S	S	S	S	S	S	S	RTR	RT	RT	T	
1	S	S	S	S	S	S	S	S	S	S	RTR	RT	RT	T
0.75	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	RT	RT

PART 3 – EXECUTION (NOT USED)

END OF SECTION

TEMPLATE

SECTION 15200.150DI – Ductile Iron Pipe & Fittings For Facilities

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers Ductile Iron pipe and fittings for facilities including water treatment plants, wastewater treatment plants, pump stations, and lift stations.

B. Design-Builder shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:

1.03 REFERENCES

A. American Society of Mechanical Engineers (ASME)
   1. B16.1 – Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250

B. American Society of Testing and Materials (ASTM)
   1. A536 – Standard Specification for Ductile Iron Castings

C. American Water Works Associations (AWWA)
   1. C111 – Rubber-Gasket Joints for Cast Iron and Ductile Iron Piping
   2. C115 – Ductile Iron and Gray Iron Fittings, 3-in through 48-in (76 mm through 1200 mm), for Water
   3. C150 – Standard for the Thickness Design of Ductile Iron Pipe
   4. C151 – Ductile-Iron Pipe, Centrifugally Cast
   5. C153 – Ductile Iron Compact Fittings, 3-in through 24-in (76 mm through 610 mm) and 54-in through 64-in (1400 mm through 1600 mm), for Water Service
   6. C800 – Underground Service Line Valves and Fittings

1.04 SUBMITTALS

A. Refer to Section 15200 – Pipe and Fittings.

1.05 QUALITY ASSURANCE

A. Refer to Section 15200 – Pipe and Fittings.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Refer to Section 15200 – Pipe and Fittings.

1.07 WARRANTY

A. Refer to Section 15200 – Pipe and Fittings.

PART 2 – PRODUCTS

2.01 General

TEMPLATE

A. The acceptable nominal pipe sizes (NPS) for use are as follows: ½", ¾", 1", 1-1/2", 2", 3", 4", 6", 8", 10", 12", 14", 16", 18", 20", 24", 30", 36", 42", and 48".
B. Nominal Pipe Sizes (NPS) larger than 48" are not allowed.
C. Pipe Connections in order or preference
    1. Bell & Gasket – Underground
    2. Flanged – Aboveground
    3. Mechanical Joints
        a. Transitions between Pipes of different materials
        b. Aboveground/Belowground Pipe Transitions
        c. Located 5D to 10D away from rotating equipment nozzles
D. All flanged connections shall be used with annular ring gaskets that meet the requirements of Appendix C, Section C.2 of AWWA C111.
E. Pipe and Fittings to be used for service underground shall be covered with AWWA C105 – PE Encasement.
F. Epoxy lining shall be substituted for cement mortar if this specification is used for the following services: Septic Sewer, Aerobic Digestion, Anaerobic Digestion, Return-Activated Sludge, Waste-Activated Sludge
G. Ductile Iron Saddles shall be utilized when taps are required per this specification.
H. Flanges shall not be used in underground installations.
I. Mechanical Joints may be used in underground installations only to fasten to valves.
J. For Nominal Pipe Sizes (NPS) ½" and ¾", stainless steel tubing may be utilized if for connecting to remote-mounted instrumentation. Tubing provided must include an threaded tap adapter for 1" or greater.

2.02 Abbreviations

A. Pressure
    1. PC – Pressure Class
    2. PR – Pressure Rating
B. Pipe
    1. DIPS – Ductile Iron Pipe Size
    2. IPS – Iron Pipe Size
    3. NPS – Nominal Pipe Size
    4. OD – Outside Diameter
    5. SDR – Standard Diametric Ratio
    6. WT – Wall Thickness
B. Elbow Types
    1. LR – Long Radius
    2. 3D – 3D Bend Radius
    3. 5D – 5D Bend Radius
    4. SR – Short Radius
C. End Types
    1. BE – Beveled End
    2. BBE – Beveled Both Ends
    3. B&G – Bell & Spigot
    4. PE – Plain End
    5. PBE – Plain Both Ends
    6. FTE – Female Threaded End
    7. MTE – Male Threaded End
    8. SWE – Socket Welded Ed
    9. TBE – Threaded Both Ends

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10. THD - Thread

D. Flange Types
   1. FF – Full Face
   2. RF – Raised Face
   3. RTJ – Ring Type Joint
   4. WN – Weld Neck

E. Pipe Manufacturing Types
   1. ERW – Electric Resistance Welded
   2. HFW – High Frequency Weld
   3. SMLS – Seamless

F. Reducer Types
   1. CONC – Concentric
   2. ECC – Eccentric

G. Tee Types
   1. RED – Reduced
   2. STD – Standard

2.03 Process Conditions

A. For all other design criteria not listed herein, refer to Section 01810 – Project Design Criteria.
   1. Service(s): Potable Water, Raw Water, Process Drain, Wastewater, Reclaimed Water
   2. Temperature(s)
      a. Low Temperature: -20°F
      b. High Temperature: 100°F
   3. Installation Location: Aboveground/underground
   4. Pressure Rating: 150 psi
   5. Corrosion Allowance (A): 0.00 in.

2.04 Components

A. The following materials may be used for the process conditions listed. Listed Sizes are the size of the header.

B. Pipe
   1. 3” – 12”
      a. PIPE, XX" NPS, PC350, B&G, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING, AWWA C105 PE ENCASEMENT
      b. PIPE, XX” NPS, PC350, FF, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING, FOR USE WITH ANNULAR RING(S) GASKETS ONLY
      c. PIPE, XX” NPS, PC350, PE, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING
   2. 14” – 20”
      a. PIPE, XX" NPS, PC250, B&G, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING, AWWA C105 PE ENCASEMENT
      b. PIPE, XX” NPS, PC250, FF, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING
      c. PIPE, XX” NPS, PC250, PE, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING
   3. 24” – 24”

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a. PIPE, XX" NPS, PC200, B&G, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING, AWWA C105 PE ENCASEMENT
b. PIPE, XX" NPS, PC200, FF, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING
c. PIPE, XX" NPS, PC200, PE, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING

4. 30" – 36"
   a. PIPE, XX" NPS, PC150, B&G, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING, AWWA C105 PE ENCASEMENT
   b. PIPE, XX" NPS, PC150, FF, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING
   c. PIPE, XX" NPS, PC150, PE, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING
5. 42" – 42"
   a. PIPE, XX" NPS, PC200, B&G, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING, AWWA C105 PE ENCASEMENT
   b. PIPE, XX" NPS, PC200, FF, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING
   c. PIPE, XX" NPS, PC200, PE, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING
6. 48" – 48"
   a. PIPE, XX" NPS, PC150, B&G, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING, AWWA C105 PE ENCASEMENT
   b. PIPE, XX" NPS, PC150, FF, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING
   c. PIPE, XX" NPS, PC150, PE, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING

C. Pipe Fittings
1. 3" – 12"
   a. ELBOW, 1/8 BEND, XX" NPS, ANSI CL125, FF X FF, AWWA C110, ASTM A536 GRADE 65-45-12, FOR USE WITH ANNULAR RING(S) GASKETS
   b. ELBOW, 1/8 BEND, XX" NPS, ANSI CL125 X PR350, FF X MJ, AWWA C110, ASTM A536 GRADE 65-45-12, FOR USE WITH ANNULAR RING(S) GASKETS ONLY
   c. ELBOW, 1/8 BEND, XX" NPS, PR350, MJ X MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   d. ELBOW, ¼ BEND, XX" NPS, ANSI CL125, FF X FF, AWWA C110, ASTM A536 GRADE 65-45-12, FOR USE WITH ANNULAR RING(S) GASKETS ONLY
   e. ELBOW, 1/4 BEND, XX" NPS, ANSI CL125 X PR350, FF X NHM AWWA C119M ASTN A536 GRADE 65-45-12, FOR USE WITH ANNULAR RING(S) GASKETS ONLY
   f. ELBOW, ¼ BEND, XX" NPS, PR350, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   g. TEE, STD, XX" NPS, ANSI CL125, FF x FF, AWWA C110, ASTM A536 GRADE 65-45-12, FOR USE WITH ANNULAR RING(S) GASKETS ONLY

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h. TEE, STD, XX" NPS, ANSI CL125 x PR350, FF X MJ, AWWA C110, ASTM A536 GRADE 65-45-12, FOR USE WITH ANNULAR RING(S) GASKETS ONLY
i. TEE, STD, XX" NPS, PR350, MJ x MJ, AWWA C110, ASTMA536 GRADE 65-45-12
j. TEE, RED, XX" x XX" x XX" NPS, ANSI CL125, FF X FF, AWWA C110, ASTM A536 GRADE 65-45-12, FOR USE WITH ANNULAR RING(S) GASKETS ONLY
k. TEE, RED, XX" x XX" x XX" NPS, ANSI CL125 x PR350, FF X MJ, AWWA C110, ASTM A536 GRADE 65-45-12, FOR USE WITH ANNULAR RING(S) GASKETS ONLY
l. TEE, RED, XX" x XX" x XX" NPS, PR350, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
m. REDUCER, CONC, XX" x XX" NPS, ANSI CL125, FF X FF, AWWA C110, ASTM A536 GRADE 65-45-12, FOR USE WITH ANNULAR RING(S) GASKETS ONLY
n. REDUCER, CONC, XX" x XX" NPS, ANSI CL125 x PR350, FF X MJ, AWWA C110, ASTM A536 GRADE 65-45-12, FOR USE WITH ANNULAR RING(S) GASKETS ONLY
o. REDUCER, CONC, XX" x XX" NPS, PR350, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
p. SADDLE, XX" x XX" NPS, PR350, BOLT CLAMP x THD, AWWA C151, AWWA C111, ASTM A536 GRADE 65-45-12
q. SLEEVE, XX" NPS, PR350, MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12

2. 14" – 48"
   a. ELBOW, 1/8 BEND, XX" NPS, ANSI CL125, FF X FF, AWWA C110, ASTM A536 GRADE 65-45-12
   b. ELBOW, ¼ BEND, XX" NPS, ANSI CL125, FF X FF, AWWA C110, ASTM A536 GRADE 65-45-12
   c. TEE, STD, XX" NPS, ANSI CL125, FF X FF, AWWA C110, ASTM A536 GRADE 65-45-12
   d. TEE, RED, XX" x XX" NPS, ANSI CL125, FF X FF, AWWA C110, ASTM A536 GRADE 65-45-12
   e. REDUCER, CONC, XX" x XX" NPS, ANSI CL125, FF X FF, AWWA C110, ASTM A536 GRADE 65-45-12
3. 14" – 20"
   a. ELBOW, 1/8 BEND, XX" NPS, ANSI CL125 x PR250, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   b. ELBOW, 1/8 BEND, XX" NPS, PR250, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   c. ELBOW, ¼ BEND, XX" NPS, ANSI CL125 x PR250, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   d. ELBOW, 1/4 BEND, XX" NPS, PR250, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   e. TEE, STD, XX" NPS, ANSI CL125 x PR250, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   f. TEE, STD, XX" NPS, PR250, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   g. TEE, RED, XX" x XX" x XX" NPS, ANSI CL125 x PR250, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12

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h. TEE, RED, XX" x XX" x XX" NPS, PR250, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
i. REDUCER, CONC, XX" x XX" NPS, ANSI CL125 x PR250, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
j. REDUCER, CONC, XX" x XX" NPS, PR250, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
k. SADDLE, XX" x XX" NPS, PR250, BOLT CLAMP x THD, AWWA C151, AWWA C111, ASTM A536 GRADE 65-45-12
l. SLEEVE, XX" NPS, PR250, MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12

4. 24" – 24"
   a. ELBOW, 1/8 BEND, XX" NPS, ANSI CL125 x PR200, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   b. ELBOW, 1/8 BEND, XX" NPS, PR200, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   c. ELBOW, ¼ BEND, XX" NPS, ANSI CL125 x PR200, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   d. ELBOW, ¼ BEND, XX" NPS, PR200, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   e. TEE, STD, XX" NPS, ANSI CL125 x PR200, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   f. TEE, STD, XX" NPS, PR200, MJ X MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   g. TEE, RED, XX" x XX" x XX" NPS, ANSI CL125 x PR200, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   h. TEE, RED, XX" x XX" x XX" NPS, PR200, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   i. REDUCER, CONC, XX" x XX" NPS, ANSI CL125 x PR200, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   j. REDUCER, CONC, XX" x XX" NPS, PR200, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   k. SLEEVE, XX" NPS, PR200, MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   l. SADDLE, XX" x XX" NPS, PR200, BOLT CLAMP x THD, AWWA C151, AWWA C111, ASTM A536 GRADE 65-45-12
5. 30" – 36"
   a. ELBOW, 1/8 BEND, XX" NPS, ANSI CL125 x PR150, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   b. ELBOW, 1/8 BEND, XX" NPS, PR150, MJ X MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   c. ELBOW, ¼ BEND, XX" NPS, ANSI CL125 x PR150, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   d. ELBOW, ¼ BEND, XX" NPS, PR150, MJ X MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   e. TEE, STD, XX" NPS, ANSI CL125 x PR150, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   f. TEE, STD, XX" NPS, PR150, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12

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g. TEE, RED, XX" x XX" x XX" NPS, ANSI CL125 x PR150, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
h. TEE, RED, XX" x XX" x XX" NPS, PR150, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
i. REDUCER, CONC, XX" x XX" NPS, ANSI CL125 x PR150, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
j. REDUCER, CONC, XX" x XX" NPS, PR150, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
k. SADDLE, XX" x XX" NPS, PR150, BOLT CLAMP x THD, AWWA C151, AWWA C111, ASTM A536 GRADE 65-45-12
l. SLEEVE, XX" NPS, PR150, MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12

6. 42" – 42"
   a. ELBOW, 1/8 BEND, XX" NPS, ANSI CL125 x PR200, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   b. ELBOW, 1/8 BEND, XX" NPS, PR200, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   c. ELBOW, ¼ BEND, XX" NPS, ANSI CL125 x PR200, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   d. ELBOW, ¼ BEND, XX" NPS, PR200, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   e. TEE, STD, XX" NPS, ANSI CL125 x PR200, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   f. TEE, STD, XX" NPS, PR200, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   g. TEE, RED, XX" x XX" x XX" NPS, ANSI CL125 x PR200, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   h. TEE, RED, XX" x XX" x XX" NPS, PR200, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   i. REDUCER, CONC, XX" x XX" NPS, ANSI CL125 x PR200, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   j. REDUCER, CONC, XX" x XX' NPS, PR200, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   k. SADDLE, XX" x XX" NPS, PR200, BOLT CLAMP x THD, AWWA C151, AWWA C111, ASTM A536 GRADE 65-45-12
   l. SLEEVE, XX" NPS, PR200, MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
7. 48" – 48"
   a. ELBOW, 1/8 BEND, XX" NPS, ANSI CL125 x PR150, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   b. ELBOW, 1/8 BEND, XX" NPS, PR150, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   c. ELBOW, ¼ BEND, XX" NPS, ANSI CL125 x PR150, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
   d. ELBOW, ¼ BEND, XX" NPS, PR150, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
   e. TEE, STD, XX" NPS, ANSI CL125 x PR150, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12

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f. TEE, STD, XX" NPS, PR150, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
g. TEE, RED, XX" x XX" x XX" NPS, ANSI CL125 x PR150, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
h. TEE, RED, XX" x XX" NPS, PR150, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
i. REDUCER, CONC, XX" x XX" NPS, ANSI CL125 x PR150, FF X MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12
j. REDUCER, CONC, XX" x XX" NPS, PR150, MJ x MJ, AWWA C110, ASTM A536 GRADE 65-45-12
k. SADDLE, XX" x XX" NPS, PR150, BOLT CLAMP x THD, AWWA C151, AWWA C111, ASTM A536 GRADE 65-45-12
l. SLEEVE, XX" NPS, PR150, MJ, AWWA C110, AWWA C111, ASTM A536 GRADE 65-45-12

D. Flanges, Gaskets, and Bolts
1. 3" – 48"
a. BOLTS, STUD, XX" DIAM. x XX" LENGTH, ASME B16.1, ASME B1.1, ASTM A193 GRADE B8 WITH TWO (2) HEAVY HEX ASTM A194 GRADE 8 NUTS PER FLANGE (1 SET = XX BOLTS)
b. CAP SCREWS, HEX HEAD, XX" DIAM. x XX" LENGTH, ASME B16.1, ASME B1.1, ASTM A193 GRADE B8 WITH TWO (2) HEAVY HEX ASTM A194 GRADE 8 NUTS PER FLANGE (1 SET = XX BOLTS)
c. BOLTS, TEE HEAD, XX" DIAM. x XX" LENGTH, AWWA C111, ASME B1.1, ASTM A193 GRADE B8 WITH TWO (2) HEAVY HEX ASTM A194 GRADE 8 NUTS PER FLANGE (1 SET = XX BOLTS)
2. 3" – 12"
a. FLANGE ADAPTER, XX" NPS, PR350, FF, AWWA C111, ASTM A536 GRADE 65-45-12, FOR USE WITH ANNULAR RING(S) GASKETS ONLY
b. GASKET, XX" NPS, PR350, B&G, AWWA C111, SBR (TABLE 8 PROPERTIES)
c. GASKET, XX" NPS, PR350, FF, AWWA C111, W/ANNULAR RING(S)
d. GASKET, XX" NPS, PR350, MJ, AWWA C111, SBR (TABLE 4 PROPERTIES)
e. GLAND, XX" NPS, PR350, MJ, AWWA C111, ASTM A536 GRADE 65-45-12, AWWA C151 ASPHALTIC COATING
3. 14" – 20"
a. FLANGE ADAPTER, XX" NPS, PR250, FF, AWWA C111, ASTM A536 GRADE 65-45-12
b. GASKET, XX" NPS, PR250, B&G, AWWA C111, SBR (TABLE 8 PROPERTIES)
c. GASKET, XX" NPS, PR250, FF, AWWA C111, W/ANNULAR RING(S)
d. GASKET, XX" NPS, PR250, MJ, AWWA C111, SBR (TABLE 4 PROPERTIES)
e. GLAND, XX" NPS, PR250, MJ, AWWA C111, ASTM A536 GRADE 65-45-12, AWWA C151 ASPHALTIC COATING
4. 24" – 24"
a. FLANGE ADAPTER, XX" NPS, PR200, FF, AWWA C111, ASTM A536 GRADE 65-45-12
b. GASKET, XX" NPS, PR200, B&G, AWWA C111, SBR (TABLE 8 PROPERTIES)
c. GASKET, XX" NPS, PR200, FF, AWWA C111, W/ANNULAR RING(S)
d. GASKET, XX" NPS, PR200, MJ, AWWA C111, SBR (TABLE 4 PROPERTIES)

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e. GLAND, XX" NPS, PR200, MJ, AWWA C111, ASTM A536 GRADE 65-45-12, AWWA C151 ASPHALTIC COATING

5. 30" – 36"
   a. FLANGE ADAPTER, XX" NPS, PR150, FF, AWWA C111, ASTM A536 GRADE 65-45-12
   b. GASKET, XX" NPS, PR150, B&G, AWWA C111, SBR (TABLE 8 PROPERTIES)
   c. GASKET, XX" NPS, PR150, FF, AWWA C111, W/ANNULAR RING(S)
   d. GASKET, XX" NPS, PR150, MJ, AWWA C111, SBR (TABLE 4 PROPERTIES)
   e. GLAND, XX" NPS, PR150, MJ, AWWA C111, ASTM A536 GRADE 65-45-12, AWWA C151 ASPHALTIC COATING
6. 42" – 42"
   a. FLANGE ADAPTER, XX" NPS, PR200, FF, AWWA C111, ASTM A536 GRADE 65-45-12
   b. GASKET, XX" NPS, PR200, B&G, AWWA C111, SBR (TABLE 8 PROPERTIES)
   c. GASKET, XX" NPS, PR200, FF, AWWA C111, W/ANNULAR RING(S)
   d. GASKET, XX" NPS, PR200, MJ, AWWA C111, SBR (TABLE 4 PROPERTIES)
   e. GLAND, XX" NPS, PR200, MJ, AWWA C111, ASTM A536 GRADE 65-45-12, AWWA C151 ASPHALTIC COATING
7. 48" – 48"
   a. FLANGE ADAPTER, XX" NPS, PR150, FF, AWWA C111, ASTM A536 GRADE 65-45-12
   b. GASKET, XX" NPS, PR150, B&G, AWWA C111, SBR (TABLE 8 PROPERTIES)
   c. GASKET, XX" NPS, PR150, FF, AWWA C111, W/ANNULAR RING(S)
   d. GASKET, XX" NPS, PR150, MJ, AWWA C111, SBR (TABLE 4 PROPERTIES)
   e. GLAND, XX" NPS, PR150, MJ, AWWA C111, ASTM A536 GRADE 65-45-12, AWWA C151 ASPHALTIC COATING

2.05 Bolts

A. The Diameter x Length of Stud Bolts are as follows.
   1. 3" NPS: 5/8" Ø x 4-5/8" Length
   2. 4" NPS: 5/8" Ø x 5" Length
   3. 6" NPS: 3/4" Ø x 5-3/4" Length
   4. 8" NPS: 3/4" Ø x 6" Length
   5. 10" NPS: 7/8" Ø x 6-5/8" Length
   6. 12" NPS: 7/8" Ø x 6-3/4" Length
   7. 14" NPS: 1" Ø x 7-5/8" Length
   8. 16" NPS: 1" Ø x 7-3/4" Length
   9. 18" NPS: 1-1/8" Ø x 8-1/2" Length
   10. 20" NPS: 1-1/8" Ø x 8-3/4" Length
   11. 24" NPS: 1-1/4" Ø x 9-5/8" Length
   12. 30" NPS: 1-1/2" Ø x 11-1/8" Length
   13. 36" NPS: 1-1/2" Ø x 11-5/8" Length
   14. 42" NPS: 1-1/2" Ø x 12-1/8" Length
   15. 48" NPS: 1-1/2" Ø x 12-3/8" Length

B. One Set of Bolts shall be equivalent to the number of bolts required to properly bolt and torque one (1) ANSI 125 flanged set.

TEMPLATE

NPS	ANSI 125 BOLT QTY.	NPS	ANSI 125 BOLT QTY.	NPS	ANSI 125 BOLT QTY.
3"	4	16"	16	48"	44
4"	8	18"	16		
6"	8	20"	20		
8"	8	24"	20		
10"	12	30"	28		
12"	12	36"	32		
14"	12	42"	36		

2.06 Branch Reinforcement

A. Branch Table Abbreviations are as follows
   1. TAP - Tap
   2. T – Standard Tee
   3. RT – Reduced Tee
   4. RTR – Reduced Tee with Reducer
   5. DNU – Do Not Use
      a. For any header size and branch size labeled as DNU, designer shall not have any branch piped directly to the header size listed.

TEMPLATE

B. For the preferred branch connections, refer to the branch table(s) listed herein.

Branch Size (NPS)	Header Size (NPS)												
	48	42	36	30	24	20	18	16	14	12	10	8	6
48	T												
42	RT	T											
36	RT	RT	T										
30	RT	RT	RT	T									
24	RT	RT	RT	RT	T								
20	RT	RT	RT	RT	RT	T							
18	RT	RT	RT	RT	RT	RT	T						
16	RT	RT	RT	RT	RT	RT	RT	T					
14	RT	RT	RT	RT	RT	RT	RT	RT	T				
12	RT	RT	RT	RT	RT	RT	RT	RT	RT	T			
10	RT	RT	RT	RT	RT	RT	RT	RT	RT	RT	T		
8	RT	RT	RT	RT	RT	RT	RT	RT	RT	RT	RT	T	
6	RT	RT	RT	RT	RT	RT	RT	RT	RT	RT	RT	RT	T
4	RTR	RTR	RTR	RTR	RTR	RTR	RTR	RTR	RTR	RT	RT	RT	RT
3	RTR	RTR	RTR	RTR	RTR	RTR	RTR	RTR	RTR	RTR	RTR	RTR	RT
2	TAP	TAP	TAP	TAP	TAP	TAP	TAP	TAP	TAP	TAP	RTR	RTR	RTR
1.5	TAP	TAP	TAP	TAP	TAP	TAP	TAP	TAP	TAP	TAP	TAP	TAP	RTR
1	TAP	TAP	TAP	TAP	TAP	TAP	TAP	TAP	TAP	TAP	TAP	TAP	TAP
0.75	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU

Branch Size (NPS)	Header Size (NPS)					
	4	3	2	1.5	1
4	T				
3	RT	T			
2	RTR	RTR	T		
1.5	RTR	RTR	RTR	T	
1	RTR	RTR	RTR	RTR	T
0.75	DNU	DNU	DNU	DNU	DNU

TEMPLATE

PART 3 – EXECUTION (NOT USED)

END OF SECTION

TEMPLATE

SECTION 15200.150SS – Stainless Steel Pipe & Fittings

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers stainless steel pipe and fittings for ANSI Class 150 systems.

B. Design-Builder shall furnish all labor, materials, equipment and incidentals as necessary to comply with requirements as shown on Drawings and as specified herein.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Sections, apply to this Section.

B. Related Sections include the following:
   1. Section 01019 – Closeout Procedures
   2. Section 01740 – Warranty
   3. Section 01810 – Project Design Criteria

1.03 REFERENCES

A. American Society of Mechanical Engineers (ASME)
   1. B1.1 – Unified Inch Screw Threads
   2. B16.5 – Pipe Flanges and Flanged Fittings
   3. B16.9 – Factory-Made Wrought Buttwelding Fittings
   4. B16.11 – Forged Fittings, Socket-Welding and Threaded
   5. B16.20 – Metallic Gaskets for Pipe Flanges
   6. B31.3 – Process Piping
   7. B36.10M – Welded and Seamless Wrought Steel Pipe

B. American Society of Testing and Materials (ASTM)
   1. A182/A182M – Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service
   2. A193/A193M – Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
   3. A194/A194M – Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
   4. A312/A312M – Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
   5. A403/A403M – Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings

C. Manufacturer's Standardization Society
   1. SP-97 – Integrally Reinforced Forced Branch Outlet Fittings: Socket Welding, Threaded, and Buttwelding Ends.

1.04 SUBMITTALS

A. Refer to Section 15200 – Pipe and Fittings.

1.05 QUALITY ASSURANCE

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A. Refer to Section 15200 – Pipe and Fittings.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Refer to Section 15200 – Pipe and Fittings.

1.07 WARRANTY

A. Refer to Section 15200 – Pipe and Fittings.

PART 2 – PRODUCTS

2.01 General

A. The acceptable nominal pipe sizes (NPS) for use are as follows: ½", ¾", 1", 1-1/2", 2", 3", 4", 6", 8", 10", 12", 14", 16", 18", 20", and 24".
B. Nominal Pipe Sizes (NPS) larger than 24" are not allowed.
C. Pipe Connections in order or preference
    1. Butt Welds – 3" and larger
    2. Socket Welds – 2" and smaller
    3. Threaded – 1" and smaller
D. For Nominal Pipe Sizes (NPS) ½" and ¾", stainless steel tubing may be utilized if for connecting to remote-mounted instrumentation.
E. Reduced fittings shall not reduce any more than two (2) nominal pipe sizes.
    1. Acceptable examples: 12" x 10", 12" x 8", 10" x 8", 10" x 6"
    2. Non-acceptable examples: 12" x 6", 12" x 4", 10" x 4", 10" x 3"
F. If a reduced fitting is used with reducer, then each component (fitting & reducer may not reduce more than four (4) nominal pipe sizes in total.
    1. Acceptable example: 12" x 12" x 8" Reduced Tee with 8" x 4" Reducer
    2. Non-acceptable example: 14" x 14" x 8" Reduced Tee with 8" x 4" Reducer

2.02 Abbreviations

A. Pipe
    1. DIPS – Ductile Iron Pipe Size
    2. IPS – Iron Pipe Size
    3. NPS – Nominal Pipe Size
    4. OD – Outside Diameter
    5. SDR – Standard Diametric Ratio
    6. WT – Wall Thickness
B. Elbow Types
    1. LR – Long Radius
    2. 3D – 3D Bend Radius
    3. 5D – 5D Bend Radius
    4. SR – Short Radius
C. End Types
    1. BE – Beveled End
    2. BBE – Beveled Both Ends
    3. B&G – Bell & Spigot
    4. PE – Plain End
    5. PBE – Plain Both Ends
    6. FTE – Female Threaded End
    7. MTE – Male Threaded End

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8. SWE – Socket Welded Ed
9. TBE – Threaded Both Ends
10. THD - Thread

D. Flange Types
1. FF – Full Face
2. RF – Raised Face
3. RTJ – Ring Type Joint
4. WN – Weld Neck

E. Pipe Manufacturing Types
1. ERW – Electric Resistance Welded
2. HFW – High Frequency Weld
3. SMLS – Seamless

F. Reducer Types
1. CONC – Concentric
2. ECC – Eccentric

G. Tee Types
1. RED – Reduced
2. STD – Standard

2.03 Process Conditions

A. For all other design criteria not listed herein, refer to Section 01810 – Project Design Criteria.
1. Service: Potable Water
2. Ambient Environment: Potential H_2S Environment
3. Temperature(s)
a. Low Temperature: -20°F
b. High Temperature: 100°F
4. Installation Location: Aboveground
5. Class: ANSI Class 150
6. Maximum Allowable Operating Pressure: 275 psi
7. Corrosion Allowance (A): 0.00 in.
8. Design Factor: 0.72

2.04 Components

A. The following materials may be used for the process conditions listed. Listed Sizes are the size of the header.

B. Pipe
1. ¾” – 1”
a. PIPE, XX" NPS, SMLS, SCH 80S, TBE, ASME B36.10M, ASTM A312 GRADE TP304
2. 1” – 2”
a. PIPE, XX" NPS, SMLS, SCH 80S, PBE, ASME B36.10M, ASTM A312 GRADE TP304
3. 3” – 24”
a. PIPE, XX" NPS, HFW, SCH 40S, BBE, ASME B36.10M, ASTM A312 GRADE TP304

C. Pipe Fittings
1. 1” – 1”
a. BUSHING, XX" x XX" NPS CL3000, MTE X FTE, ASME B16.11, ASTM A182 GRADE F304, THREADS PER ASME B1.20.1

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b. ELBOW, XX" NPS, CL3000, MTE x MTE, ASME B16.11, ASTM A182 GRADE F304, THREADS PER ASME B1.20.1
c. ELBOW, STREET, XX" NPS, CL3000, MTE x FTE, ASME B16.11, ASTM A182 GRADE F304, THREADS PER ASME B1.20.1
d. PIPE NIPPLE, XX" NPS x 6" LENGTH, SMLS, SCH 40S, TBE, ASME B36.10, ASTM A312 GRADE TP304, THREADS PER ASME B1.20.1
e. TEE, RED, XX" x XX" x XX" NPS, CL3000, FTE x FTE x FTE, ASME B16.11, ASTM A182 GRADE F304, THREADS PER ASME B1.20.1
f. TEE, STD, XX" NPS, CL3000, FTE x FTE x FTE, ASME B16.11, ASTM A182 GRADE F304, THREADS PER ASME B1.20.1
g. UNION, XX" x XX" NPS CL3000, FTE X FTE, ASME B16.11, ASTM A182 GRADE F304, THREADS PER ASME B1.20.1

2. 1" – 2"
a. COUPLING, XX" x XX" NPS CL3000, SWE X FTE, ASME B16.11, ASTM A182 GRADE F304, THREADS PER ASME B1.20.1
b. COUPLING, XX" x XX" NPS CL3000, SWE X SWE, ASME B16.11, ASTM A182 GRADE F304
c. ELBOW, XX" NPS, CL3000, SWE x SWE, ASME B16.11, ASTM A182 GRADE F304
d. PIPE NIPPLE, XX" NPS x 6" LENGTH, SMLS, SCH 40S, PBE, ASME B36.10, ASTM A312 GRADE TP304
e. TEE, RED, XX" x XX" x XX" NPS, CL3000, SWE x SWE, ASME B16.11, ASTM A182 GRADE F304
f. TEE, STD, XX" NPS, CL3000, SWE x SWE, ASME B16.11, ASTM A182 GRADE F304

3. 2" – 24"
a. ELBOW, 45 DEG, LR, XX" NPS, SMLS, SCH 10S, BBE, ASME B16.9, ASTM A403 GRADE WP-S 304
b. ELBOW, 90 DEG, LR, XX" NPS, SMLS, SCH 10S, BBE, ASME B16.9, ASTM A403 GRADE WP-S 304
c. REDUCER, CONC, XX" x, XX" NPS, SMLS, SCH 10S, BBE, ASME B16.9, ASTM A403 GRADE WP-S 304
d. REDUCER, ECC, XX" x XX" NPS, SMLS, SCH 10S, BBE, ASME B16.9, ASTM A403 GRADE WP-S 304
e. TEE, RED, XX" x XX" x XX" NPS x, SMLS, SCH 10S, BBE, ASME B16.9, ASTM A403 GRADE WP-S 304
f. TEE, STD, XX" NPS x, SMLS, SCH 10S, BBE, ASME B16.9, ASTM A403 GRADE WP-S 304

D. Flanges, Gaskets, and Bolts
1. 3" – 24"
a. FLANGE, WN, XX" NPS, ANSI CL150, SCH 10S, RF x BE, ASME B16.5, ASTM A182 GRADE F304
b. GASKET, CAMPROFILE, XX" NPS, ANSI CL150, SCH 10S, RF, ASME B16.20, ASTM A182 GRADE F304 WITH PTFE COATING
c. BOLTS, STUD, XX" DIAM. x XX" LENGTH, ANSI CL150, ASME B1.1, ASTM A193 GRADE B8 WITH TWO (2) HEAVY HEX ASTM A194 GRADE 8 NUTS PER FLANGE (1 SET = XX BOLTS)

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d. CAP SCREWS, HEX HEAD, XX" DIAM. x XX" LENGTH, ANSI CL150, ASME B1.1, ASTM A193 GRADE B8 WITH TWO (2) HEAVY HEX NUTS PER FLANGE

E. Branch Reinforcements
1. 3" – 24"
a. ELBOLET, XX" x XX" NPS, SMLS, CL3000, BE X BE, MSS SP-97, ASTM A182 GRADE F304
b. ELBOLET, XX" x XX" NPS, SMLS, CL3000, BE X SWE, MSS SP-97, ASTM A182 GRADE F304
c. ELBOLET, XX" x XX" NPS, SMLS, CL3000, BE X THD, MSS SP-97, ASTM A182 GRADE F304, THREADS PER ASME B1.20.1
d. SOCKOLET, XX" x XX" NPS, SMLS, CL3000, BE X SWE, MSS SP-97, ASTM A182 GRADE F304
e. THREADOLET, XX" x XX" NPS, SMLS, CL3000, BE X THD, MSS SP-97, ASTM A182 GRADE F304, THREADS PER ASME B1.20.1
f. WELDOLET, XX" x XX" NPS, SMLS, CL3000, BE X BE, MSS SP-97, ASTM A182 GRADE F304

2.05 Bolts

A. The Diameter x Length of Stud Bolts are as follows.
1. 1" NPS: 1/2" Ø x 7" Length
2. 1-1/2" NPS: 1/2" Ø x 7-1/2" Length
3. 2" NPS: 5/8" Ø x 8-1/4" Length
4. 3" NPS: 5/8" Ø x 8-3/4" Length
5. 4" NPS: 5/8" Ø x 9-1/4" Length
6. 6" NPS: 3/4" Ø x 10-7/8" Length
7. 8" NPS: 3/4" Ø x 11-7/8" Length
8. 10" NPS: 7/8" Ø x 12-3/8" Length
9. 12" NPS: 7/8" Ø x 13-3/8" Length
10. 14" NPS: 1" Ø x 15" Length
11. 16" NPS: 1" Ø x 15" Length
12. 18" NPS: 1-1/8" Ø x 16-1/2" Length
13. 20" NPS: 1-1/8" Ø x 16-7/8" Length
14. 24" NPS: 1-1/4" Ø x 18" Length

B. One Set of Bolts shall be equivalent to the number of bolts required to properly bolt and torque one (1) ANSI 150 flanged set.

NPS	ANSI 150 BOLT QTY.	NPS	ANSI 150 BOLT QTY.
1"	4	10"	12
1-1/2"	4	12"	12
2"	4	14"	12
3"	4	16"	16
4"	8	18"	16
6"	8	20"	20
8"	8	24"	20

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2.06 Branch Reinforcement

A. Branch Table Abbreviations are as follows
   1. T – Standard Tee
   2. RT – Reduced Tee
   3. RTR – Reduced Tee with Reducer
   4. W - Weldolet
   5. S – Sockolet
   6. DNU – Do Not Use
      a. For any header size and branch size labeled as DNU, designer shall not have any branch piped directly to the header size listed.

B. For the preferred branch connections, refer to the branch table listed herein.

Branch Size (NPS)	Header Size (NPS)													
	24	20	18	16	14	12	10	8	6	4	3	2	1.5	1
24	T													
20	RT	T												
18	RT	RT	T											
16	RT	RT	RT	T										
14	RTR	RT	RT	RT	T									
12	RTR	RTR	RT	RT	RT	T								
10	RTR	RTR	RTR	RT	RT	RT	T							
8	RTR	RTR	RTR	RTR	RT	RT	RT	T						
6	W	W	W	W	RTR	RT	RT	RT	T					
4	W	W	W	W	W	RTR	RTR	RT	RT	T				
3	W	W	W	W	W	W	W	RTR	RT	RT	T			
2	S	S	S	S	S	S	S	S	RTR	RT	RT	T		
1.5	S	S	S	S	S	S	S	S	S	RTR	RT	RT	T	
1	S	S	S	S	S	S	S	S	S	S	RTR	RT	RT	T
0.75	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	DNU	RT	RT

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 01810 – PROJECT DESIGN CRITERIA

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:
    1. Criteria for use in selection of equipment and appurtenances specified in subsequent Sections of these Specifications, or on the Drawings.
    2. Criteria for design of tanks and other equipment fabricated off site and shipped to the Work site for installation.
    3. Criteria for use in design of anchors for connecting process, mechanical and electrical equipment, and appurtenances to supporting structures.
B. The criteria included in this Section are general criteria that apply throughout the Work unless more restrictive or more stringent criteria are indicated on the Drawings or in technical Specifications. See Drawings and Specifications for additional criteria relevant to specific locations, materials and equipment.

1.02 REFERENCES

A. American Society of Civil Engineers (ASCE):
    1. 1. 7-10 - Minimum Design Loads for Buildings and Other Structures (ASCE 7).
B. ASHRAE, Incorporated (ASHRAE).
C. International Code Council (ICC):
    1. International Plumbing Code (IPC).
D. Sheet Metal and Air Conditioning Contractor's National Association (SMACNA):
    1. Seismic Restraint Manual: Guidelines for Mechanical Systems, 4th edition.

1.03 SUBMITTALS

A. Design of supports and anchorage for structures:
    1. Shop drawings and calculations:
        a. Complete shop drawings and calculations.
        b. Calculations shall be signed and sealed by an engineer licensed in the State of Missouri.
    2. Seismic design calculations:
        a. Where seismic design calculations are specified in this Specification, such requirements will be waived for structures or equipment determined to be in Seismic Design Categories A or B.
    3. Wind design calculations:
        a. Where wind design calculations are specified in this Specification, such requirements will be waived for structures or equipment located inside other structures.

1.04 PROJECT DESIGN CRITERIA – SITE INFORMATION

A. Location:
    1. Address: 10801 NE 28th Street, Kansas City, MO 64161
    2. Site coordinates (approximate): 39°08'33N, 94°26'52

B. Elevation:
    1. Operating elevation for equipment: Refer to Form F-1 – Project Design Specifications.

1.05 PROJECT DESIGN CRITERIA – REGULATORY REQUIREMENTS

A. Code requirements of authorities having jurisdiction over the project are included in Section 01410 - Regulatory Requirements.

1.06 PROJECT DESIGN CRITERIA – OPERATING ENVIRONMENT

A. Equipment and materials for the Work shall be suitable for performance in a wastewater treatment plant environment, and under conditions specified in the following paragraphs.
    1. See technical specifications for each type of equipment for additional requirements.
B. Climate data for site:
    1. Energy Code Climate Zone: 4A (IECC 2021).
    2. Local data:
        a. Location: Kansas City, Missouri, Kansas City International Airport.
            (1) Data coordinates: Latitude 39.30 N; Longitude 94.71 W.
        b. Temperatures - Outdoor: As specified in Table 1:

	Table 1: Design Temperatures - Outdoor			
Condition		**Criteria**		
Winter (99.6%)	Heating Dry Bulb	-5°F Dry-Bulb		
	Humidification	-12.4°F Dew Point	2.9 Humidity Ratio	-0.6°F MCDB
	Coldest Month Wind Speed	28.9 MPH	35.3°F MCDB	
	Mean Coincident Wind Speed	9.6 MPH at 300° East of North		
Summer (0.4%)	Cooling	110.5 °F Dry-Bulb	76.3 °F MCWB	
	Evaporation	79.1°F WB	89.5°F MCDB	
	Mean Coincident Wind Speed	12.5 MPH at 190° East of North		
	Dehumidification	76.2°F Dew Point	142.1 Humidity Ratio	85.7°F MCDB
	Daily Mean Range	20.4°F		
Mean of annual extremes		Maximum: 100.2°F dry-bulb.		
		Minimum: -8°F dry-bulb.		

        c. Temperatures - Indoor: As specified in Table 2

Table 2: Design Temperatures - Indoor		
	Summer (°F)	Winter (°F)
Process and process equipment areas:		
• Unless otherwise noted.	10 degrees above ambient	50
• Corridors.	10 degrees above ambient	50
• Electrical, Control, and Mechanical (HVAC equipment) rooms.	85	50
Non-process areas:		
• Offices, conference rooms, vestibules, kitchen, restrooms. • Control room, wet analysis room. • PLC, instrument shop, instrument storage, electrical/com room.	75	70
• Mechanical (HVAC equipment) rooms.	75	70
• Conditioned Parts Storage Room.	75	70
• Maintenance bays, oil and tool storage, laundry, janitors closets.	10 degrees above ambient	50

3. Outdoor conditions - other:
    a. Humidity: 43.4 to 83.5 percent (NOAA 2002).
    b. Freeze-thaw conditions: 90-100 frost days per year.
4. Indoor conditions - other:
    a. Moisture conditions: As defined in individual equipment sections.

C. Rainfall design criteria:
1. Reference: 2015 IPC.
    a. 3.6 inches per hour (100-year, 1-hour storm).

1.07 PROJECT DESIGN CRITERIA - STRUCTURAL

A. GENERAL. Buildings, non-structural components and non-building structures shall be designed in accordance with this section. In the event of conflict with requirements in other sections, the more stringent criteria shall be followed.
B. DESIGN CRITERIA. Buildings, non-structural components including anchorage of such items, shall be designed in accordance with the following criteria in PART 3.

General Design Data:		
Building code and references	IBC 2012, ASCE 7-10 "Minimum Design Loads for Buildings and Other Structures", AISC 360 "Specification for Structural Steel Buildings", AISC 341 "Seismic Provisions for Structural Steel Buildings"	
Site elevation, above mean sea level	734	ft
Design flood elevation, DFE	743.33	ft
(500 yr)		
Design groundwater elevation (Ref Geotechnical Soil Report)	717	ft
Wind Design Data:		
Basic factored wind speed, V, Risk Category III	120	mph
Exposure category	C	
Importance factor (wind loads), I	N/A	
Building enclosure classification	Enclosed	
Snow Design Data:		
Ground snow load, P_g	20	psf
Importance factor (snow loads), I	1.1	
Exposure factor (C_e)	0.9	
Thermal factor (C_t)	1.0	
Ice Design Data:		
Nominal ice thickness, t	1.0	in
Concurrent wind speed, V_c	40	mph
Importance factor (ice loads – ice thickness), I_i	1.25	
Importance factor (ice loads – concurrent wind), I_w	1.0	
Seismic Design Data for Non-structural Components:		

Design short period spectral response acceleration, S_{DS}	0.135g
Component importance factor, I_P	If/As indicated in the Non-Structural Components PART 3
Seismic Design Category	B

C. WIND ANCHORAGE. Equipment that is to be located outdoors shall have anchor bolts designed for the effects of wind forces, as determined in accordance with ASCE 7, Chapter 6. Shop drawings shall include full anchor bolt details and shall be sealed by a professional engineer licensed in the state of the project. Calculations shall be furnished when requested by Engineer.

D. SEISMIC DESIGN.

a. General. Structural systems shall provide continuous load paths, with adequate strength and stiffness to transfer all seismic forces from the point of application to the point of final resistance.

b. Pre-Engineered Buildings. As Per Architectural Drawings

c. Non-Structural Components. Non-structural components are architectural, mechanical, and electrical items that are permanently attached to and supported by a structure but are not part of the structural system, as indicated in Chapter 13 of ASCE 7, and in the Non-Structural Components Description PART 3.

The Non-Structural Components Description PART 3 identifies the components that require some level of seismic design. The requirements of this paragraph are applicable only to the items listed in the Non-Structural Components Description PART 3.

All components, and the anchorage of those components to the main structure, shall be shown on construction documents prepared and sealed by a registered design professional that is licensed in the state of the project. The construction documents shall be submitted in accordance with the Submittal Procedures section. Structural calculations shall be submitted when requested by Engineer.

Design of non-structural components shall be in accordance with all applicable provisions of ASCE 7, Chapter 13. Non-structural components shall have sufficient strength and ductility to resist the specified seismic effects, and shall meet all of the design, proportioning, detailing, inspection, and quality assurance provisions of the specified building code and other referenced codes.

Non-structural components shall be attached so that seismic forces are transferred to the structural system. Curbs that support roof-mounted equipment shall be designed to transfer forces from the equipment into the main structural roof members. All structural attachments shall be bolted, welded, or otherwise positively fastened. Frictional resistance due to gravity shall not be considered in evaluating the required resistance to seismic forces.

When the Non-Structural Components Description PART 3 indicates that seismic design of any component is required, the component shall be designed to be operable during and following a design level seismic event without collapsing, breaking away from supports, creating an ignition hazard, or releasing any contents.

"W_p" shall include the total operating weight of the component or system, including, but not limited to, any insulation, fluids, and concentrated loads such as valves, condensate traps, and similar components.

Seismic effects that shall be analyzed in the design of piping systems include the dynamic effects of the piping system, contents, and supports. The interaction between piping systems and the supporting structures, including other mechanical and electrical equipment, shall also be considered. Where pipe supports are to be designed by Contractor, as required by the Pipe Supports section, both the piping and support systems shall be designed to meet the applicable requirements of ASCE 7, Chapter 13.

Non-Building Structures. Not used.

PART 2 - PRODUCTS

2.01 GENERAL

A. Equipment and materials for the project shall be suitable for the following conditions:
    1. Wastewater treatment plant conditions.
    2. Site, environmental and structural loading conditions as specified in this Section.
    3. Specific conditions listed in the relevant sections of the Contract Documents for the equipment and products under consideration.
B. Anchoring and fastening: See the following Sections for materials and installation requirements:
    1. Section 03200 - Concrete Reinforcing.
    2. Section 04200 - Unit Masonry.
    3. Section 05500 – Miscellaneous Metal.

PART 3 – EXECUTION

3.01 GENERAL

A. Design in accordance with the requirements of the building code as specified in Section 01410 - Regulatory Requirements and the references and project-specific design criteria listed in this Section.
B. In the event of conflicts between design criteria, the more restrictive or severe shall govern.

3.02 DESIGN OF SUPPORTS AND ANCHORAGE FOR EQUIPMENT AND TANKS

A. General:
    1. Anchor using anchor bolts, anchor rods, bolts, or welded studs.
    2. Anchor bolts used to resist seismic loads and wind forces shall have a standard hex bolt head.
        a. Do not use anchor bolts fabricated from rod stock with an L or J shape.
        b. Do not use post-installed anchors (including concrete anchors, sleeve anchors, flush shells, chemical anchors, powder actuated fasteners, or other types of anchor) unless indicated on the Drawings or accepted in writing by the Engineer.
    3. Anchor bolt and fastener calculations:
        a. Design for ductile failure (anchor bolt yield).
        b. Anchor bolts and fasteners embedded cast into plastic concrete or installed into cured concrete:
            (1) Design based on a minimum specified 28-day concrete compressive strength of 4,000 pounds per square inch (f'c = 4000 psi).
B. Seismic loads:
    1. Do not use friction to resist sliding resulting from seismic forces. Resist such forces only by direct application of loads to fasteners as bearing, shear, tension, or compression force(s).
    2. Do not use more than 60 percent of the weight of the mechanical and electrical equipment for designing anchors for resisting overturning due to seismic forces.
    3. For tanks and equipment with varying weight based on the volume of material contained, design anchorage to accommodate both filled and empty conditions.
        a. Do not use more than 60 percent of the weight of the tank for resisting overturning due to seismic forces.
C. Wind loads:
    1. Design load combinations shall be as specified in ASCE 7.
    2. For tanks and equipment with varying weight based on volume of material contained, evaluate anchorage considering both filled and empty conditions.

END OF SECTION

CITY OF FOUNTAINS
HEART OF THE NATION
KANSAS CITY
MISSOURI

Form F-1. Project Design Specifications

Project Number 80002542/9909
Project Title WTP - House Service Main

Criterion	Fixed (F)/ Indicative (I) / Indicative Preferred (IP)	Proposed Value	Unit	Manufacturer and Model in Base Bid	Identify deviation from and location of supporting justification in Technical Proposal
Site Location					
Address	F	1 NW Briarcliff Road, Kansas City, MO 64116			
Site Coordinates (Approximate):	F	39° 9' 23.6736" N 94° 34' 59.5668" W			
Applicable Codes					
Building Code	F	IBC 2018 with City of Kansas City, MO amendments	-		
Existing Building Code		IEBC 2018 with City of Kansas City, MO amendments			
Electrical Code	F	NEC 2017 and NFPA 70 with City of Kansas City, MO amendments			
Energy Code	F	IECC 2021 with City of Kansas City, MO amendments	-		
Fire Code	F	IFC 2018 with City of Kansas City, MO amendments	-		
Fuel Gas Code	F	IFGC 2018 with City of Kansas City, MO amendments	-		
Mechanical Code	F	IMC 2018 with City of Kansas City, MO amendments			
Plumbing Code	F	UPC 2018 with City of Kansas City, MO amendments			
Site Design Data					
Design Temperatures - Outdoor	F	Per Section 01810 - Project Design Criteria	-		
Design Temperatures - Indoor	F	Per Section 01810 - Project Design Criteria	-		
Structural Design Criteria	F	Per Section 01810 - Project Design Criteria	-		
Wind Anchorage	F	Per Section 01810 - Project Design Criteria	-		
Design Temperatures - Outdoor	F	Per Section 01810 - Project Design Criteria	-		
Building Code & References	F	Per Section 01410 - Regulatory Requirements	0		
House Service Main					
Chlorine Solution Pipe Demolition (4" NPS)	F	1400	ft		
House Service Main Pipe Length (12" NPS)	F	1100	ft		
House Service Main Pipe Length (8" NPS)	F	650	ft		
House Service Main Pipe Length (6" NPS)	F	300	ft		
Number of Hydrants	3	6	-		
Sludge House Water Length (4' NPS)	F	255	ft		
Piping Design Parameters					
Pipe Material (3" - 12" NPS)	F	DUCTILE IRON, PC350, M&J, AWWA C151, ASTM A536 GRADE 65-45-12, AWWA C104 CEMENT-MORTAR LINING	-		
Pipe Insulation Material (3" - 12" NPS)	I	INSULATION, POLYISOCYANURATE, 3" THICK, ASTM C591 TYPE 1, ASTM E84 FLAME SPREAD INDEX = 25, SMOKE SPREAD INDEX = 50 PIPE JACKET, PVC, ASTM C1917, COLOR: BLUE	-		
Piping Specialty - Self-Draining Flush	F	Mfr. Kupferle Model: Mainguard 7600 Flush Mount			
Sitework					
Demolition	I	Section 02190 - Demolition	-		
Concrete Restoration & Cleaning	I	Section 03900 - Concrete Restoration & Cleaning	-		
Building					
Concrete	I	Section 03000 - Concrete	-		
Concrete - Formwork	I	Section 03100 - Concrete Forms & Accessories	-		
Concrete - Reinforcement	I	Section 03200 - Concrete Reinforcements	-		
Concrete - Grouting	I	Section 03600 - Grout	-		
Concrete - Epoxies	I	Section 03630 - Epoxies	-		
Concrete - Sealant	I	Section 07920 - Joint Sealant	-		
Concrete - Exterior Coatings	I	Section 07100 - Dampproofing and Waterproofing	-		
Concrete - Interior Coatings	I	Section 09961 - Concrete Coating	-		
Steel - Structural	I	Section 05120 - Structural Steel Framing	-		
Steel - Coatings	I	Section 09970 - Steel Coatings	-		
Building Grounding	I	Section 16060 - Grounding and Bonding	-		
Floor Plates	I	Section 05542 - Aluminum Floor Plates	-		
Pipe Racks	I	(Section to be submitted by Design-Builder)[ADD]			
Pipe & Fittings					
House Service Pipe & Fittings	I	Section 15200.150DI - Ductile Iron Pipe & Fittings	-		
Instrumentation & Controls					
Instrumentation and Controls	I	Section 13500 - Instrumentation and Control Systems	-		
Instrumentation and Controls	I	Section 13500 - Instrumentation & Controls for Process Systems	-		
Programmable Logic Controls	I	Section 13530 - Programmable Logic Controllers	-		
Level Instruments	I	Section 13315 - Process Instrumentation & Controls	-		
Pressure Instruments	I	Section 13315 - Process Instrumentation & Controls	-		
Temperature Instruments	I	Section 13315 - Process Instrumentation & Controls	-		
Flow Instruments	I	Section 13315 - Process Instrumentation & Controls	-		
I&C - Control Descriptions	I	Section 13500 - Instrumentation and Control Systems	-		

Bidder: _____

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

DESIGN-BUILD BID FORM – PRICE SUBMITTAL

Project Number/Contract Number **80002542/C9909**

Project Title **WTP House Service Main**

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1. The undersigned Bidder, having examined the Bidding Documents, related documents and the Site of the Work, and being familiar with all the conditions affecting the proposed Work, including Laws and Regulations and the availability of materials and supplies, agrees, if this Bid is selected by CITY, to enter into a Contract with CITY in the form included in the Contract Documents to furnish all labor and materials, equipment and services necessary for the proper completion of the Work in accordance with the Contract Documents, including design services and general construction work at the price(s) stated below, which stated sums include fees and all other charges applicable to materials, appliances, labor and all things subject to and upon which other charges may be levied.
2. Bidder agrees the Contract Documents will comprise the entire agreement between CITY and Bidder. The Contract Documents are identified in the General Conditions and are incorporated into and made part hereof this Bid Form/Contract by reference.
3. The Bid Price(s) shall be shown in numeric figures only.

Design Services	$_____
Construction Services	$_____
Video Inspection	$_____
Allowance – Environmental Abatement	$ 100,000

TOTAL BASE BID PRICE IN NUMERIC FIGURES $_____
Base Bid shall include (all items including allowances)

4. The undersigned Bidder has given City's Project Manager written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by the Project Manager or by the Program Manager is acceptable to Bidder.
5. The undersigned Bidder agrees that this Price Submittal Bid shall remain subject to selection by CITY, and may not be withdrawn for ninety (90) days after the day Price Submittal Bids are opened.
6. The undersigned Bidder certifies that this Price Submittal Bid contains no modifications, deviations, riders or qualifications.
7. Form 01290.02 Schedule of Values contains prices included in the Base Bid, and are incorporated into this Bid. Form must be completed and returned with this Bid.
8. The undersigned Bidder acknowledges receipt of the following addenda listed by number and date appearing on each addendum:

Addendum Number	Dated	Addendum Number	Dated
(_____)	(_____)	(_____)	(_____)

(_____) (_____) (_____) (_____)

(_____) (_____) (_____) (_____)

(_____) (_____) (_____) (_____)

(_____) (_____) (_____) (_____)

(_____) (_____) (_____) (_____)

(_____) (_____) (_____) (_____)

9. By submitting its bid, Bidder is agreeing to meet or exceed the minimum employment goals of 10% minority and 2% women during the term of its contract with the City, or request a waiver of the goals. If a waiver is requested, Bidder must establish good faith efforts towards meeting the goals as set forth in the HRD Instructions for Construction Contracts and the City's Workforce Ordinance. Should Bidder fail to meet or exceed the minimum employment goals or otherwise establish that Bidder is entitled to a waiver under circumstances in which Bidder has previously failed to meet or exceed the goals on one or more occasions with the twenty-four month period immediately preceding the completion of the Work under this Bid Form/Contract, Bidder may be suspended from participating, either as a contractor or subcontractor, on any future contract with the City for a period ranging from thirty days to six months as further specified in the Contract Documents.

10. By submitting its bid, Bidder warrants that if its bid should exceed $300,000.00 and Bidder employs fifty (50) or more people, Bidder has an affirmative action program in place and will maintain the affirmative action program in place for the duration of its contract with the City. Bidder further warrants that it will comply with the affirmative action requirements contained in the General Conditions as incorporated by reference into this Bid Form/Contract.

11. Section 13 through Section 15 constitutes the Affidavit of Intended Utilization required to be submitted by Bidders.

12. By submitting its bid, Bidder is agreeing to the following: (1) Bidder has made by bid opening a good faith effort to meet the MBE/WBE/DBE goals established for the project; or Bidder will continue to make during the 48 hours after bid opening a good faith effort to meet the MBE/WBE/DBE goals established for the project; and (2) Bidder will timely submit its **00450 CREO 08 Contractor Utilization Plan/Request for Waiver** and **00450.01 Letter of Intent to Subcontract** for each MBE/WBE listed on the 00450 HRD 08 Construction Contractor Utilization Plan/Request for Waiver;; and (3) Bidder will submit documentation of its good faith efforts to meet the MBE/WBE/DBE goals when requested by the City. Failure to meet these requirements in good faith will result in Bidder forfeiting its bid bond.

    PROJECT GOALS: ___14_____% MBE ___14___% WBE

    BIDDER PARTICIPATION: _____% MBE _____% WBE

13. To the best of Bidder's knowledge, the following are names of certified MBEs and/or WBEs with whom Bidder, or Bidder's subcontractors, presently intend to contract with if awarded the Contract on the above project: ***(*All firms must <u>currently</u> be certified by Kansas City, Missouri Human Relations Department*)***

    a. Name of M/WBE Firm _____
       Address _____
       Telephone No. _____
       I.R.S. No. _____

Area/Scope of work _____
Subcontract amount _____

b. Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____
Area/Scope of work _____
Subcontract amount _____

c. Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____
Area/Scope of work _____
Subcontract amount _____

d. Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____
Area/Scope of work _____
Subcontract amount _____

e. Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____
Area/Scope of work _____
Subcontract amount _____

f. Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____
Area/Scope of work _____
Subcontract amount _____

14. By submitting its bid, Bidder is agreeing it will identify and timely submit within 48 Hours after Bid opening those MBE/WBE subcontractors with dollar amounts and scopes of work, which apply to or exceed the MBE/WBE goals for the Project on the **00450 HRD 08 Contractor Utilization Plan/Request for Waiver.**

15. Bidder agrees that failure to meet or exceed the MBE/WBE Goals for the above project will require the Director of Human Relations to recommend disapproval of the bid unless the Director of Human Relations finds the Bidder established good faith efforts towards meeting the goals as set forth in the HRD Forms and Instructions for Construction Projects and the City's MBE/WBE Ordinance.

Bidder: _____

Business Entity Type:

(__) Missouri Corporation
(__) Foreign Corporation
(__) Fictitious Name Registration
(__) Sole Proprietor
(__) Limited Liability Company
(__) Partnership
(__) Joint Venture
(__) Other: (Specify)_____

BIDDER
Legal name & address of Bidder, person firm, partnership, corporation, or association submitting Bid:

_____
Phone No: _____
Cell No: _____
Facsimile No: _____
Bidder's E-Mail: _____

_____
Federal ID. No. _____

I hereby certify that I have authority to execute this document on behalf of Bidder, person, firm, partnership, corporation or association submitting Bid.

By: _____
(Signature)

_____
(Print Name)

Title:_____

Date:_____

(Attach corporate seal if applicable)

NOTARY

Subscribed and sworn to before me this _____ day of _____, 20__.

My Commission Expires: _____ _____

BID BOND

Project/Contract Numbers: _____

Project Title: _____

Bond Number _____

KNOW ALL MEN BY THESE PRESENTS: That _____ of _____, as Principal, and _____ as Surety, hereby bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents unto KANSAS CITY, MISSOURI, a constitutionally chartered municipal corporation, as Obligee, in the sum of

_____Dollars ($_____), lawful money of the United States.

WHEREAS, Principal is herewith submitting its Bid to enter into a contract with Kansas City for the above referenced project,

NOW, THEREFORE the condition of this obligation is such that if the Principal is awarded the contract the Principal will, within the time required, enter into a contract and give a good and sufficient surety bonds to secure the performance of the terms and conditions of the contract and for the prompt payment of all labor and material furnished in the prosecution thereof as required by the contract documents, then this obligation shall be void; otherwise the Principal and Surety will immediately pay unto the Obligee the full amount of this bond as liquidated damages for failure to fulfill the conditions of this obligation, but in no event shall the Surety's liability exceed the penal sum hereof.

Signed, sealed and delivered this _____ day of _____. _____.

BIDDER AND PRINCIPAL

Name, address and facsimile number of Bidder and Principal

_____

_____

_____

_____

I hereby certify that I have the authority to execute this document on behalf of the Bidder and Principal.

By: _____

Title:_____

(Attach corporate seal if applicable)

SURETY

Name, address and facsimile number of Surety:

_____

_____

_____

_____

I hereby certify that (1) I have authority to execute this document on behalf of Surety; (2) Surety has an A.M. Best rating of A- or better; (3) Surety is named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (most current revision) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury; and (4) Surety is duly licensed to issue bonds in the State of Missouri and in the jurisdiction in which the Project is located.

By:_____

Title:_____

Date:_____

(Attach seal and Power of Attorney)

CREO KC INSTRUCTIONS
FOR REQUESTS FOR QUALIFICATIONS/PROPOSALS

PART A. ECONOMIC EQUITY & INCLUSION GOALS--MBE/WBE PROGRAM

I. City's Economic Equity & Inclusion Goals--MBE/WBE Program.

A. The City has adopted an Economic Equity & Inclusion Goals--Minority/Women Business Enterprise ("MBE/WBE") Program (Sections 4-421 through 3-469, Code of Ordinances) (the "Program") to implement the City's policy of supporting the fullest possible participation in City contracts and change orders of firms owned and controlled by minorities and women. Each construction project may have an MBE and/or WBE goal for participation. An MBE or WBE goal is a numerical objective the City has set for the contract. Goals are stated as a percentage of contract dollars. For example, if an MBE goal for a contract is 10% and a Proposer submits a proposal of $100,000, the goal for MBE participation would equal $10,000. The specific MBE/WBE goals on this project are set forth elsewhere in the proposal specifications.

B. By submitting a proposal, the Proposer agrees, as a material term of the contract, to carry out the Economic Equity & Inclusion Goals--MBE/WBE Program by making good faith efforts to include certified MBE/WBEs in the project work to the extent of the goals listed for the project and to the fullest extent consistent with submitting the best proposal to the City. Proposer agrees that the Program is incorporated into this document and agrees to follow the Program. Although it is not a requirement that a Proposer in fact meet or exceed both the MBE and WBE Goals, it is a requirement for approval of the proposal that a Proposer objectively demonstrate to the City that good faith efforts have been made to meet the Goals.

C. The following CREO KC Forms are attached and must be used for MBE/WBE submittals:

1. Affidavit of Intended Utilization (CREO KC Form 13); and
2. Contractor Utilization Plan/Request for Waiver (CREO KC Form 8A); and
3. Letter of Intent to Subcontract (CREO KC Form 00450.01); and
4. Timetable for MBE/WBE Utilization (CREO KC Form 10); and
5. Request for Modification or Substitution (CREO KC Form 11); and
6. Contractor Affidavit for Final Payment (Form 01290.14); and
7. Subcontractor Affidavit for Final Payment (Form 01290.15).

Warning: The City only gives MBE/WBE credit for a Proposer's use of City certified MBE/WBEs. A certified MBE/WBE firm is a firm that has been certified by the City's Civil Rights & Equal Opportunity Department as such. An MBE/WBE firm must be certified before the date on which the contractor utilization plan is due. Certified MBEs and WBEs are listed in the M/W/DBE Kansas City Mo. Online Directory, which is available on the City's website at www.kcmo.gov. Before a Proposer submits a proposal, Proposer should contact CREO KC and consult the directory to make sure any firm

proposed for use for MBE/WBE participation has been certified.

II. Required Submissions with Proposal.

A. Proposer must submit the following document with its proposal:

1. **Affidavit of Intended Utilization (CREO KC Form 13).** This form states a Proposer's intent to use certified MBE/WBEs in the performance of the contract.

III. Required Submissions Prior to Contract Award.

A. Proposer must submit the following documents prior to contract award.

1. **Contractor Utilization Plan/Request for Waiver (CREO KC Form 8).** This form states a Proposer's plan to use specific certified MBE/WBEs in the performance of the contract and includes the following:

   a. The work to be performed by each MBE/WBE and the amounts each is to be paid for the work; and

   b. The name, address, race or ethnic origin, gender and employer identification number or social security number of each MBE/WBE that will perform the work.

   c. An automatic request for waiver in the event Proposer has not met or exceeded the MBE and/or WBE goals for the contract but believes that it has made good faith efforts to meet or exceed the goals and desires a waiver of the goals. If a waiver is requested, CREO KC will examine the Proposer's documentation of good faith efforts and make a recommendation to grant or deny the waiver. CREO KC will recommend a waiver be granted only if the Proposer has made good faith efforts to obtain MBE/WBE participation.

2. **Letter(s) of Intent to Subcontract (CREO KC Form 00450.01)**. A letter must be provided from each MBE/WBE listed on the Contractor Utilization Plan. These letters verify that the MBE/WBE has agreed to execute a formal agreement for the work and indicate the scope of work to be performed and the price agreed upon for the work.

IV. Additional Required Submissions when Requested by City.

A. Proposer must submit the following documents when requested by City:

1. **Timetable for MBE/WBE Utilization (CREO KC Form 10).**

2. **Documentation of good faith efforts.**

V. Required Monthly Submissions during term of Contract.

A. Proposers must submit the following document on a monthly basis if awarded the contract:

1. **M/WBE Monthly Utilization** Report. This report must be submitted to the Director by the 15th of each month using the B2GNow Diversity Management System. Failure to submit timely reports may result in delays in processing of current and future contract approvals and payment applications.

VI. Required Submittals for Final Contract Payment.

A. Proposer must submit the following documents with its request for final payment under the contract:

1. **Contractor Affidavit for Final Payment (Form 01290.14)**
2. **Subcontractor Affidavit(s) for Final Payment (Form 01290.15)**

VII. Additional Submittals.

A. Proposer may be required to make additional submittals during the term of the Contract, including **Request for Modification or Substitution (CREO KC Form 11)**. Refer to Section X, Modification of the Contractor Utilization Plan or Substitution of an MBE/WBE, for additional instructions on when this form must be submitted.

VIII. MBE/WBE Participation Credit.

A. The following shall be credited towards achieving the goals:

1. The total contract dollar amount that a prime contractor has paid or is obligated to pay to a subcontractor that is a certified MBE or WBE, except as otherwise expressly provided for herein.
2. The total contract dollar amount that a prime contractor that is a certified MBE or WBE performed itself.
3. Sixty percent (60%) of the total dollar amount paid or to be paid by a prime contractor to obtain supplies or goods from a supplier who is a certified MBE or WBE.
4. Ten percent (10%) of the total dollar amount paid or to be paid by a prime contractor to obtain supplies or goods from a supply broker who is a certified MBE or WBE.
5. One hundred percent (100%) of the total dollar amount paid or to be paid by a prime contractor to a manufacturer of construction supplies who is a certified MBE or WBE.
6. Subcontractor participation with a lower tier MBE/WBE subcontractor using one of the above methods of participation.

B. **NO CREDIT**, however, will be given for the following:

1. Participation in a contract by a MBE or WBE that does not perform a commercially useful function as defined by the Program; and
2. Any portion of the value of the contract that an MBE or WBE subcontractor subcontracts back to the prime contractor or any other contractor who is not a qualified MBE/WBE; and
3. Materials and supplies used on the contract unless the MBE/WBE is responsible for negotiating the price, determining quality and quantity, ordering the materials and installing (where applicable) and paying for material itself; and
4. Work performed by an MBE or WBE in a scope of work other than that in which the MBE or WBE is currently certified.

IX. Methods for Securing Participation of MBE/WBEs and Good Faith Efforts.

A. A Proposer is required to make good faith efforts to achieve the MBE/WBE goals. Good faith efforts are efforts that, given all relevant circumstances, a Proposer actively and aggressively seeking to meet the goals can reasonably be expected to make. Good faith efforts must be made before the Proposer submits a Contractor Utilization Plan/Request for Waiver (CREO KC Form 8). However, efforts made to increase participation of MBEs and WBEs following submission of the CUP can be considered as evidence of good faith efforts to meet the goals.

B. In evaluating good faith efforts, the Director of CREO KC will consider whether the Proposer has performed the following, along with any other relevant factors:

1. 1. Advertised for at least 15 calendar days prior to the bid or proposal due date opportunities to participate in the contract in general circulation media, trade and professional association publications, small and minority business media, and publications of minority and women's business organizations which are included in a list along with their current contact information identified on the directory as the list of publications available to publish such advertisements, which list shall be updated by CREO KC no less than every three (3) months.

2. Sent written notices at least fifteen (15) calendar days prior to the bid or proposal due date containing the information required in section (9) below, by certified mail, e-mail, or facsimile, to at least 80% of MBEs and WBEs which are included in a list along with their contact information identified on the directory as the list of organizations available to receive such notices, which list shall be updated by CREO KC no less than every three (3) months.

3. Sent written notices, containing the information required by section (9) below, by certified mail, e-mail or facsimile, to at least 80% of MBEs and WBEs listed on the directory certified in the applicable scopes of work for the particular bid soliciting their participation in the contract at least 15 calendar days prior to the bid or proposal due date.

4. Attempted to identify portions of the work for qualified MBE and/or WBE participation in order to increase the likelihood of meeting the goals, including breaking down contracts into economically feasible units that take into consideration the capacity of available MBEs/WBEs appearing on the CREO KC directory.

5. At any time prior to submission of the CUP or submittal of a request for modification of a CUP, requested assistance in achieving the goals from the Director and acted on the Director's recommendations.

6. Conferred with certified MBEs and WBEs which inquired about or responded to the bid solicitation and explained to such MBEs and WBEs the scope and requirements of the work for which their bids or proposals were solicited, and if not all certified MBEs and WBEs in the particular scopes listed on the directory have inquired about or responded to the bid solicitation for each scope of work, then contact by certified mail, e-mail or telephone the greater of ten (10) or 80% of additional certified MBEs and WBEs in the particular scopes of work listed on the directory and offer to confer with such MBEs and WBEs for such particular scope of work and request such MBEs

and WBEs to submit a proposal.

7. Attempted to negotiate in good faith with certified MBEs and WBEs which responded to the bid solicitation or those certified MBEs and WBEs that were conferred with as contemplated in section (6) above, and other qualified MBEs and WBEs, at the option of the bidder, proposer, or contractor, as applicable, to perform specific subcontracts; not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities by the bidder, proposer, or contractor; in the event an MBE or WBE is the low bid, but rejected as unqualified, the bidder, proposer, or contractor and the director or board, as applicable, shall provide sound reasons for rejecting such MBE or WBE.
8. Attended pre-bid meeting when such meetings were indicated in the solicitation of bids or otherwise by the bidder, proposer, or contractor, as applicable or by the director provided the director provides written direction to the bidder, proposer, or contractor at the time the goals are recommended.
9. Written notices and advertisements to be provided pursuant to sections (1), (2) and (3) above shall include the following information:
    a. The bid due date;
    b. The name of the project;
    c. The address or general location of the project;
    d. The location of plans and specifications for viewing;
    e. Contact information of the prime contractor;
    f. A general description of the scopes of work that are the subject of the solicitation;
    g. The goals established for the applicable contract, and if the goals are still subject to board approval, then a statement that the goals as stated are preliminary and are subject to board approval;
    h. If the project or any portion of the project is subject to prevailing wage then a statement that all or a portion of the project will be subject to the prevailing wage, as applicable; and if only a portion of the scopes are subject to prevailing wage, then identification of such scopes provided that such scopes are known as of the time of bid solicitation;
    i. The date and time of any pre-bid meeting(s), if any, which have been scheduled by the bidder, proposer, or contractor as of the bid solicitation; and
    j. Any other information deemed relevant by the bidder, proposer, or contractor, as applicable, or the director to the extent the director provides written direction to the bidder, proposer, or contractor of such additional information at the time the goals are recommended by the director.

C. A Proposer will be required to give the City documentation to prove that it made good faith efforts. The Proposer will be contacted by the City with further instructions about

when this documentation must be submitted.

X. Modification of the Contractor Utilization Plan or Substitution of an MBE/WBE.

A. A Proposer may need to substitute an MBE and/or WBE or request that the amount of MBE/WBE participation listed in its Contractor Utilization Plan be modified. Proposer must file a **Request for Modification or Substitution (CREO KC Form 11) prior to actual substitution and within a reasonable time after learning that a modification or substitution is necessary.** The Director may approve substitutions or modifications and upon approval, the modifications and substitutions will become an amendment to the Contractor Utilization Plan. Modifications or substitutions may be approved when:

1. The Director finds that the Proposer made and provided evidence of good faith efforts to substitute the MBE/WBE listed on the Contractor Utilization Plan with other certified MBE/WBEs for the scope of work or any other scope of work in the contract; and
2. The Proposer or Contractor has not attempted intentionally to evade the requirements of the program and it is in the best interests of the City to allow a modification or substitution; and
3. The Director also finds one of the following:
    a. The listed MBE/WBE is non-responsive or cannot perform; or
    b. The listed MBE/WBE has increased its previously quoted price to the bidder, proposer or contractor without a corresponding change in the scope of the work; or
    c. The listed MBE/WBE has committed a material default or breach of its contract with the contractor; or
    d. Requirements of the scope of work of the contract have changed and render subcontracting not feasible or not feasible at the levels required by the goals established for the contract; or
    e. The listed MBE/WBE is unacceptable to the contracting department; or
    f. The listed MBE/WBE thereafter had its certification revoked; or

B. A modification shall not be made unless the modification or substitution has first been requested and approved by the Director.

XI. Appeals.

A. In conformance with the Act, appeals may be made to the City Fairness in Construction Board or Fairness in Professional Services and Goods Board on the following:

1. The grant or denial of a Request for Waiver;
2. Substitution for an MBE/WBE listed on a Contractor Utilization Plan;
3. Modification of the percentage of MBE/WBE participation on a Contractor Utilization Plan;
4. Liquidated Damages;

5. The amount of MBE/WBE credit the Contractor may receive for MBE/WBE participation identified in the contractor utilization plan.

B. Any appeal must be filed in writing with the Director within fifteen (15) calendar days of notice of the determination. Mailing, faxing, personal delivery or posting at CREO KC of determinations shall constitute notice. The appeal shall state with specificity why the Proposer or Contractor believes the determination is incorrect

C. Failure to file a timely appeal shall constitute a waiver of a Proposer's or Contractor's right to appeal such determination and such person shall be estopped to deny the validity of any determination which could have been timely appealed.

XII. Access to Documents and Records.

A. By submitting a proposal, each Proposer agrees to permit the City, its duly authorized agents or employees, access at all reasonable times to all books and business records of Proposer as may be necessary to ascertain compliance with the requirements of this document and the Act, within ten (10) calendar days of the date of the written request.

B. All Proposers agree to cooperate with the contracting department and CREO KC in studies and surveys regarding the MBE/WBE program.

XIII. Miscellaneous.

A. A Proposer or Contractor shall bear the burden of proof with regard to all issues on appeal.

B. In the event of any conflict between this document and the Program, the provisions of the Program shall control. The terms used in this document are defined in the Program.

C. Oral representations are not binding on the City.

D. The City Council may waive the requirements of this document and the Program and award the contract to the best proposer if the City Council determines a waiver is in the best interests of the City.

XIV. Liquidated Damages – Economic Equity & Inclusion Goals--MBE/WBE Program.

A. If Contractor fails to achieve the economic equity & inclusion goals stated in its Contractor Utilization Plan, as amended, the City will sustain damages, the exact extent of which would be difficult or impossible to ascertain. Therefore, in order to liquidate those damages, the monetary difference between either (1) the amount of the MBE/WBE goals set forth in the Contractor Utilization Plan, as amended, or (2) the goals established (whichever is lower) and the amount actually paid to qualified MBEs and WBEs for performing a commercially useful function will be deducted from the Contractor's payments as liquidated damages. In determining the amount actually paid to qualified MBEs and WBEs, no credit will be given for the portion of participation that was not approved by the Director, unless the Director determines that the Contractor acted in good faith. No deduction for liquidated damages will be made when, for reasons beyond the control of the Contractor, the MBE/WBE participation stated in the Contractor Utilization Plan, as amended and approved by the Director is not met.

[Specifier:** The remainder of this document is applicable ONLY IF the RFQ/P is for a construction project that the City estimates will require more than 800 construction labor hours and cost in excess of $300,000.00 to construct. If this is not applicable to your RFQ/P, delete the remainder of this document.* ***Be sure to delete this note before printing]

PART B. CONSTRUCTION EMPLOYMENT PROGRAM REQUIREMENTS

(THIS PART IS APPLICABLE TO CITY CONSTRUCTION CONTRACTS ESTIMATED BY THE CITY PRIOR TO SOLICITATION AS REQUIRING MORE THAN 800 CONSTRUCTION LABOR HOURS AND COSTING IN EXCESS OF $300,000.00.)

I. City's Construction Employment Program.

A. The City has adopted a Construction Employment Program (Sections 3-501 through 3-525, Code of Ordinances) (the "Program") to implement the City's policy of supporting the fullest possible utilization of minority and women workers in the construction industry. A person or firm who is awarded a contract to construct, reconstruct, improve, enlarge or alter any fixed work that is estimated by the City prior to solicitation as requiring more than 800 construction labor hours, has an estimated costs that exceeds $300,000.00, and involves the expenditure of public funds, is subject to company-wide construction employment goals. The minimum goals are currently set at 10% for minorities and 2% for women, but public recognition may be provided if the Proposer achieves at least twice the minimum participation. The successful Proposer may meet these company-wide goals by counting the Proposer's utilization of minorities and women throughout the Kansas City metropolitan statistical area.

B. By submitting a proposal, the Proposer agrees, as a material term of the contract, to carry out the City's Construction Employment Program by making good faith efforts to utilize minority and women workers on the Proposer's job sites to the fullest extent consistent with submitting the best proposal to the City. Proposer agrees that the Program is incorporated into this document and agrees to follow the Program. Although it is not a requirement that a Proposer in fact meet or exceed the construction employment goals to receive approval from CREO KC, a Proposer not doing so is required to objectively demonstrate to CREO KC that good faith efforts have been made.

C. The following CREO KC Forms are to be used for Construction Employment Program submittals using the B2GNow Diversity Management System:

1. Project Workforce Monthly Report
2. Company-Wide Workforce Monthly Report

II. Required Monthly Submissions during Term of Contract.

A. Proposer must submit the following documents on a monthly basis if awarded the contract:

1. **Project Workforce Monthly Report.** This report is contract specific. Two copies of this report must be submitted to the Director by the 15th of each month using the B2GNow Diversity Management System. The first copy will be utilized to report the Proposer's own workforce compliance data with regard to the City's construction contract. The

second copy will be utilized to report consolidated workforce compliance data for every subcontractor retained on the City's construction contract. Failure to submit timely reports may result in delays in processing of current and future contract approvals and payment applications.

2. **Company-Wide Workforce Monthly Report.** This report is not contract specific; it is used to report on the utilization of females and minorities, by trade, company-wide. Two copies of this report must be submitted to the Director by the 15th of each month using the B2GNow Diversity Management System. The first copy will be utilized to report the Proposer's own workforce compliance data with regard to every contract (both privately and publicly funded) Proposer has in progress throughout the Kansas City metropolitan statistical area. The second copy will be utilized to report consolidated workforce compliance data for every subcontractor retained by Proposer on every contract Proposer has in progress throughout the Kansas City metropolitan statistical area. Failure to submit timely reports may result in delays in processing of current and future contract approvals and payment applications.

III. Submittal Required for Final Contract Payment.

A. The last Project Workforce Monthly Report(s) and Company-Wide Workforce Monthly Report(s) shall serve as the final reports and must be submitted before final payment will be made and/or retainage released. Proposer shall note the submittal of the final reports by notation in the box entitled "Final Cumulative Report"

IV. Methods for Securing Workforce Participation and Good Faith Efforts.

A. A Proposer is required to make good faith efforts to achieve the construction employment goals. If a Proposer will be unable to secure enough minority and female participation to meet or exceed the construction employment goals, a Proposer must, within a reasonable time after so learning, request a waiver or modification of the goals by the Director of CREO KC. The Director will examine the Proposer's request and the Proposer's documentation of good faith efforts and grant or deny a waiver or modification. The Director will grant a waiver or modification only if the Proposer has made good faith efforts to secure minority and female participation.

B. In evaluating good faith efforts, the Director will consider whether the Proposer has performed the following:

1. For those Proposers that are not signatories to a collective bargaining agreement with organized labor:

    a. Requested in writing the assistance of the Director with respect to efforts to promote the utilization of minorities and women in the workforce and acted upon the Director's recommendations; and

    b. Advertised in minority or women trade association newsletters and/or minority or women owned media at least 15 calendar days prior to the utilization of any construction services on the city construction contract and used terminology that sufficiently describes the work available, the pay scale, the application process, and anything else that one might reasonably be expected to be informed of relevant to the position being advertised; and

c. Maintained copies of each advertisement and a log identifying the publication and date of publication; and

d. Conducted real and substantial recruitment efforts, both oral and written, targeting resident, minority and women community-based organization, schools with a significant minority student population, and training organizations serving the recruitment area; and

e. Established and maintained a current list of resident, minority and women recruitment sources, providing written notification to the recruitment sources of available employment opportunities, and maintained records of the notices submitted to the organizations and any responses thereto; and

f. Maintained a current file for the time period of the city construction contract with the name, address, and telephone number of each resident, minority and woman job applicant, the source of the referral, whether or not the person was hired, and in the event that the applicant was not hired, the reason therefore; and

g. Promoted the retention of minorities and women in its workforce with the goals of achieving sufficient annual hours for minorities and women to qualify for applicable benefits; and

h. Required by written contract that all subcontractors comply with the above efforts.

2. For those Proposers that are signatories to collective bargaining agreements with organized labor:

    a. Supported the efforts of the Joint Apprenticeship Training Committee (JATC), a joint effort of Labor Unions and contractors, or some other apprenticeship program, whose purpose is to recruit, train and employ new workers for a full-time career in the construction industry; and

    b. Requested in writing from each labor union representing crafts to be employed that:

        i. the labor union make efforts to promote the utilization of residents of the City, minorities and women in the workforce; and

        ii. the labor union identify any residents of the City, minorities and women in its membership eligible for employment; and

        iii. the JATC take substantial and real steps to increase the participation of minorities in the union apprenticeship programs in the aggregate to 30% by 2011 and encourage other labor unions to do the same; and

        iv. the JATC take substantial and real steps to increase the participation of women in the union apprenticeship programs in the aggregate to 5% by 2011 and encourage other labor unions to do the same; and

        v. the JATC partner with workforce preparedness programs, community-based organizations, employment referral programs and school-sponsored programs to accomplish these goals.

c. Collaborated with labor unions in promoting mentoring programs intended to assist minorities and women in increasing retention with the goals of achieving sufficient annual hours to qualify for applicable benefits; and

d. Maintained a current file with the name, address, and telephone number of each resident, minority and women worker identified by the labor union, whether or not the person was hired, and in the event the person was not hired, the reason therefore.

e. To the extent the good faith efforts applicable to Proposers that are signatories to collective bargaining agreements with organized labor conflict with the procedures implemented by the Proposer in order to comply with the relevant bargaining agreement, the Proposer shall substitute other procedures as may be approved by the Director in writing.

C. A Proposer will be required to give the City documentation to prove that it made good faith efforts. The Proposer will be contacted by the City with further instructions about when this documentation must be submitted.

V. Appeals.

A. In conformance with the Program, appeals may be made to the Construction Workforce Board on the following:

1. Determinations by the Director that a contractor did not meet the construction employment goals and did not make a good faith effort to meet the goals;

2. Recommendations by the Director to assess liquidated damages;

3. Recommendation by the Director that a contractor be declared ineligible to receive any city construction contract for a period of time up to one year.

B. Any appeal must be filed in writing with the Director within ten (10) working days of notice of the recommendation or determination. The appeal shall state with specificity why the Proposer believes the recommendation or determination is incorrect.

C. Failure to file a timely appeal shall constitute a waiver of a Proposer's right to appeal such determination or recommendation and such person shall be estopped to deny the validity of any order, determination, recommendation or action of CREO KC which could have been timely appealed.

VI. Access to Documents and Records.

A. By submitting a proposal, each Proposer agrees to permit the City, its duly authorized agents or employees, access at all reasonable times to all books and business records of Proposer as may be necessary to ascertain compliance with the requirements of this document and the Program, within ten (10) days of the date of the written request. Each Proposer further agrees to require, if awarded the contract, that every subcontractor permit the City the same access to documents and records.

B. All Proposers agree to cooperate with the contracting department and CREO KC in studies and surveys regarding the construction employment program.

VII. **Miscellaneous**.

A. A Proposer shall bear the burden of proof with regard to all issues on appeal.

B. The successful Proposer may be required to meet with the Director of CREO KC or the Director's designee for the purpose of discussing the construction employment program, the Proposer's efforts to realize the goals, and any other problems and/or issues affecting the realization of the goals or the program in general.

C. In the event of any conflict between this document and the Program, the provisions of the Program shall control. The terms used in this document are defined in the Program.

D. Oral representations are not binding on the City.

VIII. Liquidated Damages; Suspension – Workforce Program.

A. If a Proposer fails to achieve the construction employment goals without having previously obtained a waiver or modification of those goals, the City will sustain damages, the exact extent of which would be difficult or impossible to ascertain. These damages are magnified if the failure to abide by the requirements of the Workforce Program is recurring. Therefore, in order to liquidate those damages, City shall be entitled to deduct and withhold the following amounts:

> If Proposer failed to meet or exceed the minimum employment goals or otherwise establish that Proposer is entitled to a waiver under circumstances in which Proposer has failed to meet or exceed the goals on one prior occasion within the twenty-four month period immediately preceding the completion of the work under the Contract, the sum of three thousand dollars ($3,000.00).
>
> If Proposer failed to meet or exceed the minimum employment goals or otherwise establish that Proposer is entitled to a waiver under circumstances in which Proposer has failed to meet or exceed the goals on two or more prior occasions within the twenty-four month period immediately preceding the completion of the work under the Contract, the sum of seven thousand dollars ($7,000.00).

B. In addition, Proposer shall be required to attend mandatory compliance training or be declared ineligible to contract with the City for a term provided herein, and as authorized by City's Code of Ordinances:

> If Proposer failed to meet or exceed the minimum employment goals or otherwise establish that Proposer is entitled to a waiver under circumstances in which Proposer has not previously failed to meet or exceed the goals within the twenty-four month period immediately preceding the completion of the work under the Contract, Proposer shall be required to attend a mandatory training class on Workforce Program compliance.
>
> If Proposer failed to meet or exceed the minimum employment goals or otherwise establish that Proposer is entitled to a waiver under circumstances in which Proposer has failed to meet or exceed the goals on one prior occasion within the twenty-four month period immediately preceding the completion of the work under the Contract, Proposer shall be suspended from participating, either as a contractor or subcontractor, on any future contract with the City for a period of thirty (30) days. Proposer waives any right to invoke any proceeding or procedure under Sections 3-321 of City's Code of Ordinances with regards to any

suspension arising hereunder.

If Proposer failed to meet or exceed the minimum employment goals or otherwise establish that Proposer is entitled to a waiver under circumstances in which Proposer has failed to meet or exceed the goals on two or more prior occasions within the twenty-four month period immediately preceding the completion of the work under the Contract, Proposer shall be suspended from participating, either as a contractor or subcontractor, on any future contract with the City for a period of six (6) months. Proposer waives any right to invoke any proceeding or procedure under Sections 3-321 of City's Code of Ordinances with regards to any suspension arising hereunder.

CONTRACTOR UTILIZATION PLAN/REQUEST FOR WAIVER

Project Number _____

Project Title _____

_____ _____
(Department Project) Department

_____
(Bidder/Proposer)

STATE OF_____)
) ss
COUNTY OF_____)

I,_____, of lawful age and upon my oath state as follows:

1. This Affidavit is made for the purpose of complying with the provisions of the MBE/WBE submittal requirements on the above project and the MBE/WBE Program and is given on behalf of the Bidder/Proposer listed below. It sets out the Bidder/Proposer's plan to utilize MBE and/or WBE contractors on the project.

2. The project target goals are_____**% MBE** and_____**% WBE.**

3. Bidder/Proposer assures that it will utilize a minimum of the following percentages of MBE/WBE participation in the above project:

   - **BIDDER/PROPOSER PARTICIPATION:_____% MBE_____% WBE**

   - **POST-BID/POST-RFP ESTIMATED BUDGET: $_____**

4. The following are the M/WBE subcontractors whose utilization Bidder/Proposer warrants will meet or exceed the above-listed Bidder/Proposer Participation. Bidder/Proposer warrants that it will utilize the M/WBE subcontractors to provide the goods/services described in the applicable Letter(s) of Intent to Subcontract, copies of which shall collectively be deemed incorporated herein). ***(All firms must currently be certified by Kansas City, Missouri)***

   - Name of M/WBE Firm _____
     Address_____
     Telephone No. _____
     I.R.S. No. _____

Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____

Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____

Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____

Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____

Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____

(List additional M/WBEs, if any, on additional page and attach to this form)

4. The following is a breakdown of the percentage of the total contract amount that Bidder/Proposer agrees to pay to each listed M/WBE:

MBE/WBE BREAKDOWN SHEET

MBE FIRMS:

Name of MBE Firm	Supplier/Broker/Contractor	Subcontract Amount*	Weighted Value**	% of Total Contract

TOTAL MBE $ / TOTAL MBE %: $_____ _____%

WBE FIRMS:

Name of WBE Firm	Supplier/Broker/Contractor	Subcontract Amount*	Weighted Value**	% of Total Contract

TOTAL WBE $ / TOTAL WBE %: $_____ _____%

*"Subcontract Amount" refers to the dollar amount that Bidder/Proposer has agreed to pay each M/WBE subcontractor as of the date of contracting and is indicated here solely for the purpose of calculating the percentage that this sum represents in proportion to the total contract amount. Any contract amendments and/or change orders changing the total contract amount may alter the amount due an M/WBE under their subcontract for purposes of meeting or exceeding the Bidder/Proposer participation.

**"Weighted Value" means the portion of the subcontract amount that will be credited towards meeting the Bidder/Proposer participation. See CREO KC Forms and Instructions for allowable credit and special instructions for suppliers.

5. Bidder/Proposer acknowledges that the monetary amount to be paid each listed M/WBE for their work, and which is approved herein, is an amount corresponding to the percentage of the total contract amount allocable to each listed M/WBE as calculated in the MBE/WBE Breakdown Sheet. Bidder/Proposer further acknowledges that this amount may be higher than the subcontract amount listed therein as change orders and/or amendments changing the total contract amount may correspondingly increase the amount of compensation due an M/WBE for purposes of meeting or exceeding the Bidder/Proposer participation

6. Bidder/Proposer acknowledges that it is responsible for considering the effect that any change orders and/or amendments changing the total contract amount may have on its ability to meet or exceed the Bidder/Proposer participation. Bidder/Proposer further acknowledges that it is responsible for submitting a Request for Modification or Substitution if it will be unable to meet or exceed the Bidder/Proposer participation set forth herein.

7. If Bidder/Proposer has not achieved both the M/WBE goal(s) set for this Project, Bidder/Proposer hereby requests a waiver of the MBE and/or WBE goal(s) that Bidder/Proposer has failed to achieve

8. Bidder/Proposer will present documentation of its good faith efforts, a narrative summary detailing its efforts and the reasons its efforts were unsuccessful when requested by the City.

9. I hereby certify that I am authorized to make this Affidavit on behalf of the Bidder/Proposer named below and who shall abide by the terms set forth herein:

Bidder/Proposer primary contact: _____
Address: _____
_____
Phone Number: _____
Facsimile number: _____
E-mail Address: _____

By: _____
Title: _____
Date: _____
(Attach corporate seal if applicable)

Subscribed and sworn to before me this_____day of_____, 20____.

My Commission Expires: _____ _____
Notary Public

LETTER OF INTENT TO SUBCONTRACT

Check one:	
Original LOI:	☐
Updated LOI:	☐

Project Name/Title _____

Project Location/Number _____

PART I: Prime Contractor_____agrees to enter into a contractual agreement with M/W/DBE Subcontractor_____who will provide the following goods/services in connection with the above-reference contract: [Insert a brief narrative describing goods/services to be provided. Broad Categorizations (e.g., "electrical," "plumbing," etc.) or the listing of NAICS Codes in which M/W/DBE Subcontractor is certified are insufficient and may result in denial of this Letter of Intent to Subcontract.]

_____

_____

_____

for an estimated amount of $_____(or_____% of the total estimated contract value.)

M/WBE Vendor type:

☐ Subcontractor/manufacturer (counts as 100% of contract value towards goals)

☐ Supplier (counts as 60% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)

☐ Broker (counts as 10% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)

M/W/DBE Subcontractor is, to the best of Prime Contractor's knowledge, currently certified with the City of Kansas City's Civil Rights & Equal Opportunity Department to perform in the capacities indicated herein. Prime Contractor agrees to utilize M/W/DBE Subcontractor in the capacities indicated herein, and M/W/DBE Subcontractor agrees to work on the above-referenced contract in the capacities indicated herein, contingent upon award of the contract to Prime Contractor.

PART 2: This section is to be completed by the M/W/DBE subcontractor listed above. Please attach additional sheets as needed for more than one intended sub-tier contract. **IMPORTANT: Falsification of this document will result in denial and other remedies available under City Code.**

Select one:

☐ The M/W/DBE Subcontractor listed above **IS NOT** subcontracting any portions of the above-stated scope of work(s). (Continue to Part 3.)

☐ The M/W/DBE Subcontractor listed above **IS** subcontracting certain portions of the above stated scope of work(s) to:

(1) Company name: _____

Full address: _____
Street number and name City, State and Zip Code

Primary contact: _____
Name Phone

a) This subcontractor is (select one): ☐MBE ☐WBE ☐DBE N/A

i: If this subcontractor is an M/W/DBE certified with the City of Kansas City, Missouri, a separate Letter of Intent must be attached to this document.

ii. If this subcontractor is NOT a certified M/W/DBE certified with the City of Kansas City, Missouri, the firm must still be listed for reporting purposes but a Letter of Intent is not required.

b) Scope of work to be performed: _____

c) The dollar value of this agreement is: _____

PART 3:

NOTE: SIGNATURES AND NOTARIZATIONS REQUIRED FOR NEW LETTERS OF INTENT (LOI); SIGNATURES ONLY FOR UPDATED LOI (ADDING VALUE TO EXISTING CONTRACT).

PRIME CONTRACTOR BUSINESS NAME: _____

_____ _____

Signature: Prime Contractor Print Name

_____ _____

Title Date

State of)

County of)

I,_____, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this day of_____, 20_____

My Commission Expires: _____ _____

Notary Public

STAMP:

MWDBE SUBCONTRACTOR BUSINESS NAME: _____

_____ _____

Signature: Subcontractor Print Name

_____ _____

Title Date

State of)

County of)

I,_____, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this ___ day of_____, 20_____

My Commission Expires: _____ _____

Notary Public

STAMP:

TIMETABLE FOR MBE/WBE UTILIZATION

(This form should be submitted to the City after contract award.)

I, _____, acting in my capacity as _____
(Name) *(Position with Firm)*
of _____, with the submittal of this Timetable, certify that
(Name of Firm)
the following timetable for MBE/WBE utilization in the fulfillment of this contract is correct and true to the best of my knowledge.

ALLOTTED TIME FOR THE COMPLETION OF THIS CONTRACT
(Check one only)

15 days	___	75 days	___	135 days	___
30 days	___	90 days	___	150 days	___
45 days	___	105 days	___	165 days	___
60 days	☐	120 days	☐	180 days	☐

Other _____ (Specify)

Throughout _____ Beginning 1/3 _____
Middle 1/3 _____ Final 1/3 _____
Beginning 1/3 _____% Middle 1/3 _____% Final 1/3 _____%

PLEASE NOTE: Any changes in this timetable require approval of the Civil Rights & Equal Opportunity Department in advance of the change.

If you have any questions regarding the completion of this form, please contact the Civil Rights & Equal Opportunity Department at: (816) 513-1836**.**

_____
(Signature)

_____
(Position with Firm)

_____
(Date)

CREO KC MONTHLY REPORTING INSTRUCTIONS

M/WBE Monthly Utilization Report Instructions

1. MBE/WBE Reporting applies to Contracts that have approved MBE/WBE goals assigned.
2. The City will utilize a web-based MBE/WBE Reporting System in the administration of this Contract. This web-based application database is a collaboration tool selected and provided by the City, which will allow Contractors and Consultants/Subcontractors and Subconsultants to enter data and report on compliance.

Prevailing Wage Certified Payroll Report Instructions

1. Prevailing Wage Certified Payroll Report applies to Contracts that include Prevailing Wage or Davis Bacon Provisions.
2. This web-based application database is provided by the City for reporting certified payrolls and other related prevailing wage data.
3. Computer Requirements: Minimum Intel Pentium® 4 Processor 2.4 GHz or equivalent processor with 512MB of RAM; recommended Centrino Duo® Processors 1.6 GHz or equivalent with 2GB of RAM, or higher.
    a. Computer Operation System: Windows XP, Windows Vista, or Windows 7
    b. Web Browser: Google Chrome
    c. Connection Speed/Minimum Bandwidth: DSL, ADSL or T1 Line for transferring a minimum of 3 Mbps Downstream and 512 Kbps Upstream
4. City will assist Contractor in providing training of personnel and Subcontractor's personnel.
5. Contractor and Subcontractors shall have the responsibility for visiting the web site and entering data in on timely basis, and as necessary to be in compliance with Prevailing Wage Requirements included in their contracts.

Workforce Monthly Report Instructions

1. Workforce Monthly Reporting only applies to Construction Contracts greater than $300,000 and greater than 800 projected labor hours.
2. The City will utilize a web-based Reporting System in the administration of this Contract. This web-based application database is a collaboration tool selected and provided by the City, which will allow Contractors and Subcontractors to enter data and report on Workforce compliance.

City of Kansas City, Missouri
Civil Rights & Equal Opportunity Department
Construction Contractor Employee Identification Report

Company Name: _____ **Prime's Name:** _____

Company Address: _____ **KCMO Project Name:** _____

Company City, State, Zip: _____ **KCMO Project Number:** _____

Name of Person Completing Report: _____ **Today's Date:** _____

Phone Number: _____

Email: _____ **City Department:** _____

Instructions:

1) Each applicable Prime Contractors **must complete this form for its company within 48 hours of bid opening**
2) The Civil Rights & Equal Opportunity Department strongly recommends usage of the electronic version of this form. This form may be obtained by visiting www.kcmo.gov website. The website is enabled with a "search" function on the Home page on the right corner. Select the magnifying glass and type in the search field "Contract Central". Select the first result, then click on the link to Standard City Contract Forms. Scroll down to Construction Contractor Employee Identification Report and click the link to open this document. Complete the fields in the Employee section; the Official Use Only section will automatically populate. NOTE: This form can be printed and attached to other required Bid documents.
3) All subcontractors shall be required to complete this form and submit to the Prime Contractor. For each subcontractor, the Prime must submit this form to City at least at least (10) days prior to the date the subcontractor shall commence work under a city construction contract.
4) Complete this form if you are the Prime contractor on a City construction project estimated over **$300,000 & over 800 man hours.**
5) Complete this form with data from your **current construction workforce** (no office personnel).
6) Prime contractor is responsible to ensure subcontractor completes this form as required in #3 above.

Official Use Only

Females		*KCMO Resident*
African American	*0*	*0*
Asian/Pacific Islander American	*0*	*0*
Caucasian American	*0*	*0*
Hispanic/Latino American	*0*	*0*
Native American	*0*	*0*
Other	*0*	*0*
	0	*0*

Males		*KCMO Resident*
African American	*0*	*0*
Asian/Pacific Islander American	*0*	*0*
Caucasian American	*0*	*0*
Hispanic/Latino American	*0*	*0*
Native American	*0*	*0*
Other	*0*	*0*
	0	*0*

Number of KCMO Residents	*0*
Number of Journeyman	*0*
Number of Apprentice	*0*

	Journeyman	*Apprentice*
Foreman/Supervisor	*0*	*--*
Asbestos Worker	*0*	*0*
Boilermaker	*0*	*0*
Bricklayer	*0*	*0*
Carpenter	*0*	*0*
Cement Mason	*0*	*0*
Electrician	*0*	*0*
Elevator Constructor	*0*	*0*
Glazier	*0*	*0*
Iron Worker	*0*	*0*
Laborer	*0*	*0*
	0	*0*

	Journeyman	*Apprentice*
Operating Engineer	*0*	*0*
Painter	*0*	*0*
Pipe Fitter/Plumber	*0*	*0*
Plasterer	*0*	*0*
Roofer	*0*	*0*
Sheet Metal	*0*	*0*
Sprinkler Fitter	*0*	*0*
Truck Driver	*0*	*0*
Welder	*0*	*0*
Other	*0*	*--*
	0	*0*

Company Name: 0 KCMO Project Name: 0 KCMO Project Number: 0

	Name		Job Title (*use drop down menu*)	Address	City	State	Zip Code	KCMO Resident	Gender	Ethnicity
	Last	First								
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2										
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Company Name: 0 KCMO Project Name: 0 KCMO Project Number: 0

	Name		Job Title (*use drop down menu*)	Address	City	State	Zip Code	KCMO Resident	Gender	Ethnicity
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Company Name: 0 KCMO Project Name: 0 KCMO Project Number: 0

	Name		Job Title (*use drop down menu*)	Address	City	State	Zip Code	KCMO Resident	Gender	Ethnicity
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Company Name: 0 KCMO Project Name: 0 KCMO Project Number: 0

	Name		Job Title (*use drop down menu*)	Address	City	State	Zip Code	KCMO Resident	Gender	Ethnicity
	Last	First								
81										
82										
83										

AFFIDAVIT OF TRAINING PROGRAM

This form must be submitted with 48 hours of Bid Opening

Bidder _____

Project Title and Number _____

STATE OF MISSOURI)
) ss:
COUNTY OF _____)

After being duly sworn the person whose name and signature appears below hereby states under penalty of perjury that:

1. I am the duly authorized officer of the business indicated above ("Bidder") and I make this affidavit on behalf of Bidder.
2. Bidder certifies that it presently participates in a training program that facilitates entry into the construction industry and which may include an on-the-job or in-house training program, further described as follows:

(attach additional pages, if necessary)

3. If requested by the City, Bidder agrees to provide City further documentation of, or other information about, this training program within 48 hours of the request.
4. Bidder acknowledges that failure to submit this form to the City within 48 hours of the Bid Opening will automatically render its bid non-responsive.

I am authorized to make this Affidavit on behalf of the Bidder named below as:

_____ of _____
(Title) (Name of Bidder)

Dated: _____ By: _____
(Affiant)

Subscribed and sworn to before me this _____ day of _____, 20____.

My Commission Expires: _____ _____
Notary Public

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

Pre-Contract Bidder's Certification

Project Number _____

Project Title _____

STATE OF)
) SS
COUNTY OF)

Before me, the undersigned authority, personally appeared, who, being by me duly sworn deposed as follows:

I am authorized to make this affidavit on behalf of the named Bidder. I am of sound mind, capable of making this affidavit, and personally acquainted with the facts herein stated:

A. Bidder is current on payment of its Federal and State Income tax withholding and unemployment insurance payments, either in Missouri for companies doing business in Missouri, or in the state in which Bidder has its principal office; and

B. Bidder declares one of the following, regarding all work performed two (2) years immediately preceding the date of the Bid (check one):

☐ Contract by contract listing of all of Bidder's written notices of violations of any Federal or State prevailing wage statute in which prevailing wage penalties were assessed against the Bidder or paid by the Bidder (Complete and attach additional sheets if necessary):

1. _____
2. _____
3. _____

☐ There have been no written notices of violations of any Federal or State prevailing wage statute in which prevailing wage penalties were assessed against the Bidder or paid by the Bidder.

C. Bidder is currently in good standing with the Missouri Secretary of State or Bidder has filed a Registration of Fictitious Name with the Missouri Secretary of State.

_____
(Bidder's Name) (Date)

Signature of Person Making This Affidavit

In witness whereof, I have hereunto subscribed my name and affixed my official seal this ___day of , 20__.

EMPLOYEE ELIGIBILITY VERIFICATION AFFIDAVIT

(Required for any contract with the City of Kansas City, Missouri in excess of $5,000.00)

STATE OF _____)
) ss
COUNTY OF _____)

On this _____ day of _____, 20___, before me appeared _____, personally known by me or otherwise proven to be the person whose name is subscribed on this affidavit and who, being duly sworn, stated as follows:

I am of sound mind, capable of making this affidavit, and personally swear or affirm that the statements made herein are truthful to the best of my knowledge. I am the _____ (title) of _____ (business entity) and I am duly authorized, directed or empowered to act with full authority on behalf of the business entity in making this affidavit.

I hereby swear or affirm that the business entity does not knowingly employ any person in connection with the contracted services who does not have the legal right or authorization under federal law to work in the United States as defined in 8 U.S.C. § 1324a(h)(3).

I hereby additionally swear or affirm that the business entity is enrolled in an electronic verification of work program operated by the United States Department of Homeland Security (E-Verify) or an equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, under the Immigration Reform and Control Act of 1986, and that the business entity will participate in said program with respect to any person hired by the business entity to perform any work in connection with the contracted services. I have attached hereto documentation sufficient to establish the business entity's enrollment and participation in the required electronic verification of work program.

I am aware and recognize that unless certain contractual requirements are satisfied and affidavits obtained as provided in Section 285.530, RSMo, the business entity may face liability for violations committed by its subcontractors, notwithstanding the fact that the business entity may itself be compliant.

I acknowledge that I am signing this affidavit as the free act and deed of the business entity and that I am not doing so under duress.

_____
Affiant's signature

Subscribed and sworn to before me this _____ day of _____, 20____.

_____
Notary Public

My Commission expires:

CITY OF FOUN
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ADDENDUM NUMBER 1

Project/Contract Number 80002542/9909

Title/Description WTP House Service Main

ISSUE DATE: 1/23/2025

TO ALL PROSPECTIVE BIDDERS/PROPOSERS:

This Addendum addresses the following questions:

Q1.	Do you have a map of the site showing the House Service Main replacements for the 12", 8" and 6" main locations
A1.	**All maps and piping related drawings are available in attachment D on Planroom**

Information to Bidders is provided to Bidders for information only:

1. See Attachment: WTP House Service Mandatory Pre-Proposal Meeting PPT
2. See Attachment: Mandatory Pre-Proposal Meeting attendees list

NOTE: Bidders must acknowledge receipt of this Addendum by listing the number and date on the Proposal.

Name	Organization	Email
Saurabh Kelkar	KC Water	Saurabh.Kelkar@kcmo.org
Mike Akins	SheDigsIt	mike@shedigsit.com
Corey O'Neill	Mega KC	coneill@megakc.com
Mike Gillard	Cerris	mgillard@cerris.com
Dana Bartch	DuBois Consultants	dbartch@duboisengrs.com
Brooke A. Hudlemeyer	Garver USA	BAHudlemeyer@GarverUSA.com
Maxwell Hampton	Cerris	mhampton@cerris.com
Brian Hess	GBA	bhess@gbateam.com
Dayton Snyder	Cerris	dsnyder@cerris.com
Ethan Stanfill	Mega KC	estanfill@megakc.com
Jon Gray	DuBois Consultants	jgray@duboisengrs.com
Christopher Davis	EAEI	cdavis@eaei.com
Kaleb O. Belcher	Garver USA	KOBelcher@GarverUSA.com
Christopher Herrera	KC Water	Chris.Herrera@kcmo.org
Delois Moore	KC Water	Delois.Moore@kcmo.org
Lamin Nyang	Taliaferro & Browne	lnyang@tb-engr.com
Blake Anderson	KC Water	Blake.W.Anderson@kcmo.org
Jack Hruska	Goodwin Brothers	jhruska@goodwinbros.com
Cervente Sudduth	DuBois Consultants	csudduth@duboisengrs.com
Jill Biesma	EAEI	jbiesma@eaei.com

KCWATER

WTP House Service Main – Agenda
Project #: 80002542 Contract # 9909

- Introductions
- Bidder Instructions
- Project Information
- Final Reminders

Wednesday January 22nd, 9:30 am

Potential Bidders

Mandatory Pre-Proposal Meeting

WTP House Service Main – Project Team

KC Water

- Chief Engineering Officer: Jeff Martin
- Facilities & Plants Engineering Division Head: Blake Anderson
- Project Manager: Saurabh Kelkar
- Contract Administrator: Delois Moore

WTP House Service Main – Project Team

Project Manager: Saurabh Kelkar

Phone Number: (816) 513-0223

E-Mail: Saurabh.Kelkar@kcmo.org

Contract Administrator: Delois Moore

Phone Number: (816) 513-0358

E-Mail: Delois.Moore@kcmo.org

Civil Rights & Equal Opportunities Department (CREO)

CREO Approved Goals: 14% MBE and 14% WBE

MBE/WBE Compliance Inquiries:

Alvaro Ontiveros
Alvaro.Ontiveros@kcmo.org

Workforce Compliance Inquiries:

Valerie Johnson
Phone (816) 513-1406
Valerie.Johnson@kcmo.org

Bidder Instructions

Sealed Bids Due Wednesday, March 5th, 2025, by 2:00 PM

Technical Approach Submittal and Price Submittal to be in separate envelopes/packages.

Outside of each envelope/package must include:

Bidder's Name and Address

Project No. 80002542

Invitation For Bid – Technical Approach Submittal for Project No. 80002542

Deliver to:

Delois Moore, Manger of Procurement Services at Water Services

4800 E. 63rd Kansas City,

Kansas City, MO 64130

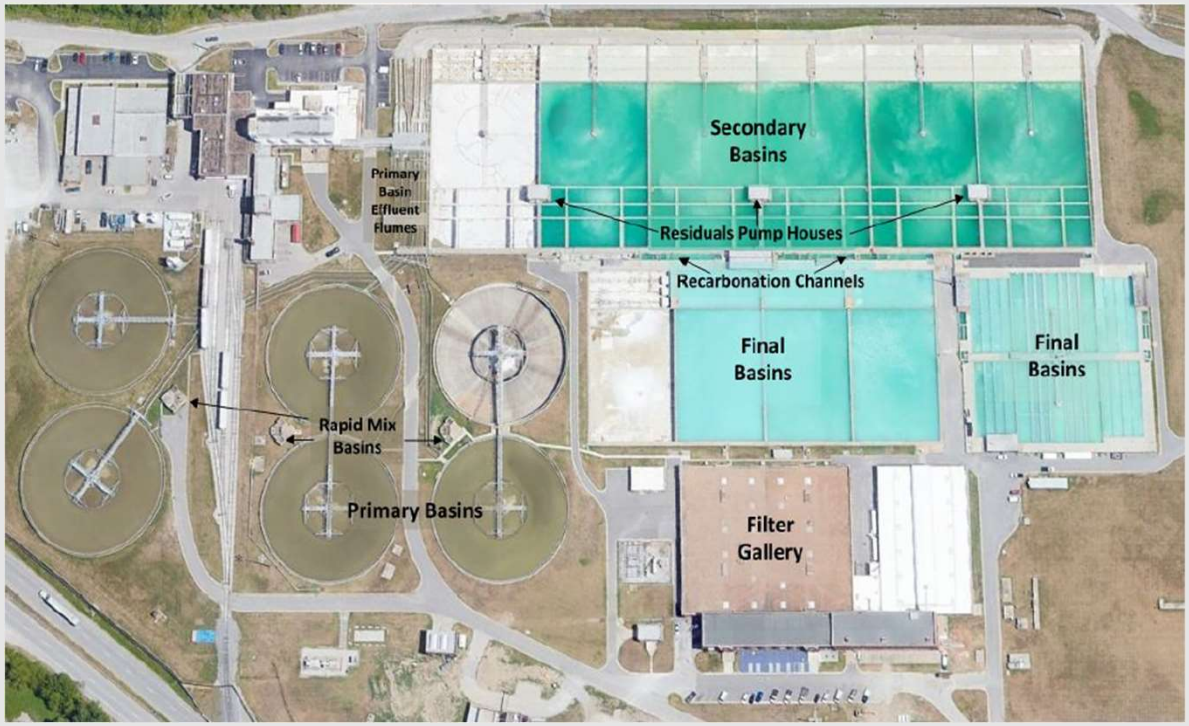
Project Information & Details

WTP House Service Main

Project Overview

The City is requesting a FPDB:

1. House Service Main Replacement (12in, 8in & 6in NPS)
2. Hydrant Replacement
3. Removal of O.O.S Piping
4. Pipe Rack Replacement
5. Condition Assessment and Replacement of Flush Lines to Sludge Houses
6. Condition Assessment and Replacement of Sludge Discharge lines form Sludge Houses
7. Concrete Repair

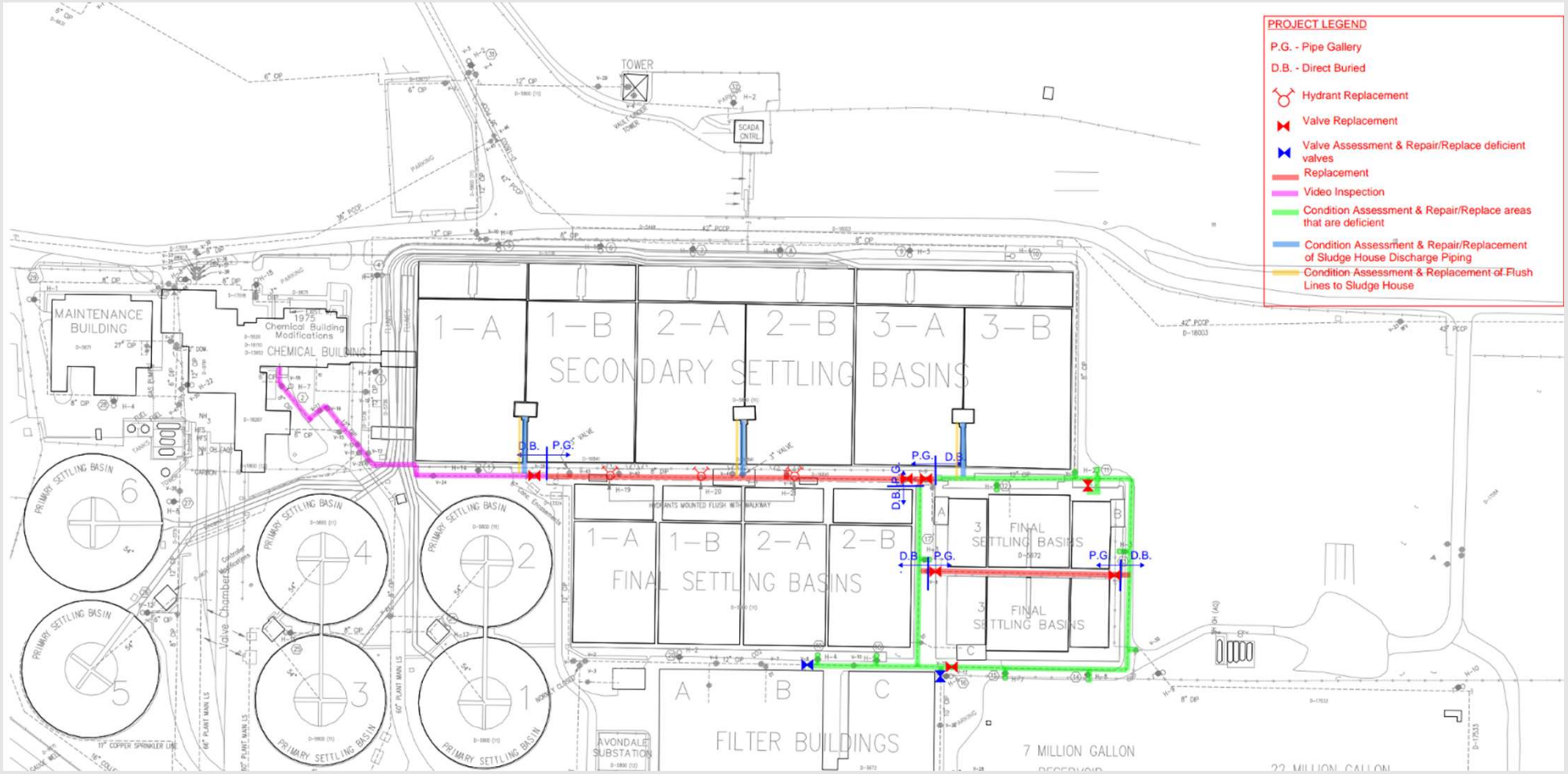


Project Overview – General Information

- $2,000,000.00 budget to be utilized in Design-build proposal (bid shall not exceed this value)
- Design-builders should indicate what project elements are in bid (i.e., 7 elements from previous slide)
- Basemap and other relevant documents available on Planroom
- 2 phase project under 1 contract
  - Design Phase & Construction Phase

KCWATER

WTP House Service Main



Final Reminders

Site Visit (Mandatory) is February 5-6, 2025, from 8:30 – 10:00 am

1 NW Briarcliff Rd, KCMO, 64116

Questions are due February 19th, 2025, by 2pm

Sealed Bids are due March 5th, 2025, by 2pm

Deliver to:

Delois Moore, Manger of Procurement Services at Water Services
4800 E. 63rd Kansas City,
Kansas City, MO 64130

Questions?

Project Manager: Saurabh Kelkar

Phone Number: (816) 513-0223

E-Mail: Saurabh.Kelkar@kcmo.org

Contract Administrator: Delois Moore

Phone Number: (816) 513-0358

E-Mail: Delois.Moore@kcmo.org

KCWATER

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

ADDENDUM NUMBER 2

Project/Contract Number 80002542/9909

Title/Description WTP House Service Main

ISSUE DATE: 1/27/2025

TO ALL PROSPECTIVE BIDDERS/PROPOSERS:

This Addendum addresses the following questions:

Q2.	Page 23-24 of the design-build services states drawings shall be included in appendix D. Listed in this section includes hydraulic calculations, PFD's, equipment cut sheets etc. These are all items that would be included in the full design. What specific items does the City want to see in the drawings section if anything?
A2.	**The language of the drawings section has been updated. Reference that moving forward.**
Q3.	Is there an existing hydraulic model of the plant's system?
A3.	**No, there is not.**
Q4.	BIM files are supposed to be in attachment D and stated they are on KCMO Plan Room but we are not seeing those files?
A4.	**There exists no complete BIM model for the project, but a draft BIM model file exists, which will be included in the project documents.**
Q5.	Do you have a process flow diagram for the house service system?
A5.	**No, there is not.**
Q6.	Is there any information available regarding water hammer issues the City maybe experiencing?
A6.	**Any anticipated water hammer in the existing system would be from our house service pumps themselves. All the pumps dedicated to this system are across the line start and stop. Additionally, the tunnel location does not have thrust blocking for larger connections.**
Q7.	On Pg 758 of the PDF Form F-1 Project design specification calls out piping design parameters which indicate a "fixed" design parameter of ductile iron pipe (for 3" -12") while further down in the table, Pipe & Fittings – House Service Pipe & Fittings are called out as an "indicative" design parameter of ductile. Is ductile iron pipe a "fixed"

	design parameter?
A7.	**Yes, ductile iron pipe is a "fixed" design parameter. Change has been made to form F-1 to reflect this.**

Information to Bidders is provided to Bidders for information only:

1. See Attachment: Revit file - House Service Main Rudimentary (made available upon request)

This addendum revises referenced bid/proposal and/or specifications documents as follows:

1. Delete and replace the following section(s):

   a. **Delete RFP sec**. Drawings, Subparagraph: Design-Builder shall include drawings in Appendix D - D – Design Drawings to illustrate and document its proposed technical design approach for the Representative Project (or approved Proposed Modified Project) and to complement the technical narrative. Reference shall be made to drawings within the major element narratives, Page 23.

      Replace RFP with sec. Drawings, Subparagraph: Design-Builder may include drawings in Appendix D - D – Design Drawings to illustrate and document its proposed technical design approach for the Representative Project (or approved Proposed Modified Project), Page 23.

   b. **Delete RFP sec**. Drawings, Subparagraph: It is anticipated that the Respondent will use the provided project information in Attachment C – Project Background Documents, Attachment D – Project BIM Files, Attachment E – Technical Specifications, Attachment F – Project Design Criteria, as the basis for their design of the Representative Project (or approved Proposed Modified Project), Page 23.

      Replace RFP with sec. Drawings, Subparagraph: It is anticipated that the Respondent will use the provided project information in Attachment C – Project Background Documents, Attachment D – Project BIM Files, Attachment E – Technical Specifications, Attachment F – Project Design Criteria, as the basis for their design of the Representative Project (or approved Proposed Modified Project) during the design phase and any clarifying drawings in the proposal, Page 23.

   c. **Delete RFP sec.** Drawings, Subparagraph:
      General
      - Cover sheet
      - Index of Drawings

• Legend, abbreviations and general notes
• Hydraulic Calculations (Final) – include hydraulic losses for service lines being replaced with different pipe size or different cross sectional areas.
• Process Flow Diagram (PFD) – indicate major equipment, tanks and channels, major piping complete with valves, control elements, pipe size and pipe material. PFDs formatted to be used as P&IDs, Page 23.

Replace RFP with sec. Drawings, Subparagraph:
General
• Cover sheet
• Index of Drawings
• Legend, abbreviations and general notes
• Hydraulic Calculations – include hydraulic losses for service lines being replaced with different pipe size or different cross sectional areas if updates are necessary to price the work.
• Process Flow Diagram (PFD) – indicate major equipment, tanks and channels, major piping complete with valves, control elements, pipe size and pipe material. PFDs formatted to be used as P&IDs as necessary to communicate the design intent. City will assume workmanship and will follow the project specifications or the general workmanship of recent projects if the proposal does not cover a detail, Page 23.

d. **Add to RFP sec.** 2.2 Roles and Responsibilities, Subparagraph: City,
    - Design-Builder is responsible for verifying accuracy of Existing survey information, GIS Data, 2D drawing documents and existing BIM models, Page 8.

e. **Add to sec.** 1.05 BIM INFORMATION PROVIDED BY OWNER, Subparagraph: A. Existing,
    6. Existing survey information, GIS Data, 2D drawing documents and existing BIM models are provided for INFORMATION ONLY and is not intended to be used for design purposes, Page 151/Section 01340 – Project BIM Coordination.

f. **Delete Form F-1 sec.** Pipe & Fittings, Subsection: House Service Pipe & Fittings, Indicative (I).

Replace Form F-1 sec. Pipe & Fittings, Subsection: House Service Pipe & Fittings, Fixed (F).

NOTE: Bidders must acknowledge receipt of this Addendum by listing the number

and date on the Proposal.

CITY OF FOUN
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ADDENDUM NUMBER 3

Project/Contract Number 80002542/9909

Title/Description WTP House Service Main

ISSUE DATE: 2/13/2025

TO ALL PROSPECTIVE BIDDERS/PROPOSERS:

Information to Bidders is provided to Bidders for information only:

1. See Attachment: D.02 Pipe Gallery Demo Updated

This addendum revises referenced bid/proposal and/or specifications documents as follows:

1. Delete and replace the following section(s):

    a. **Delete Form D.02:** Pipe Gallery Demo

    Replace with Form D.02: Pipe Gallery Demo Updated

    b. **Delete Form F-1 sec.** Pipe Design Parameters, Subsection: Pipe insulation Material (3" – 12" NPS), Indicative (I).

    Replace Form F-1 sec. Pipe Design Parameters, Subsection: Pipe insulation Material (3" – 12" NPS), Fixed (F).

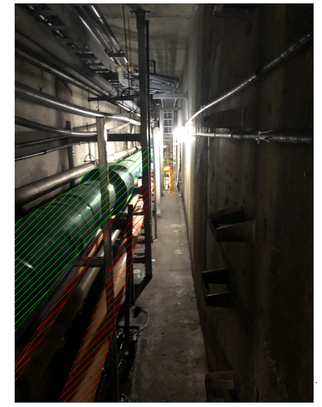
NOTE: Bidders must acknowledge receipt of this Addendum by listing the number and date on the Proposal.

Legend

- Demolish Pipe. As applicalbe it will be purged and free of gases before removal.
- Demolish Pipe. Contractor shall'inspect demolishedd Ductile Iron Pipe, if identified to be suitable by both Contractor and City it may be re-installed for use.
- Valves shall be reused in the new 8" Ductile Iron Main.
- Replace Pipe with 4 x 4 Ductile Iron T with a Blind Flange
- Refer to Detail 10 when replacing/repairing pipe and refilling concrete

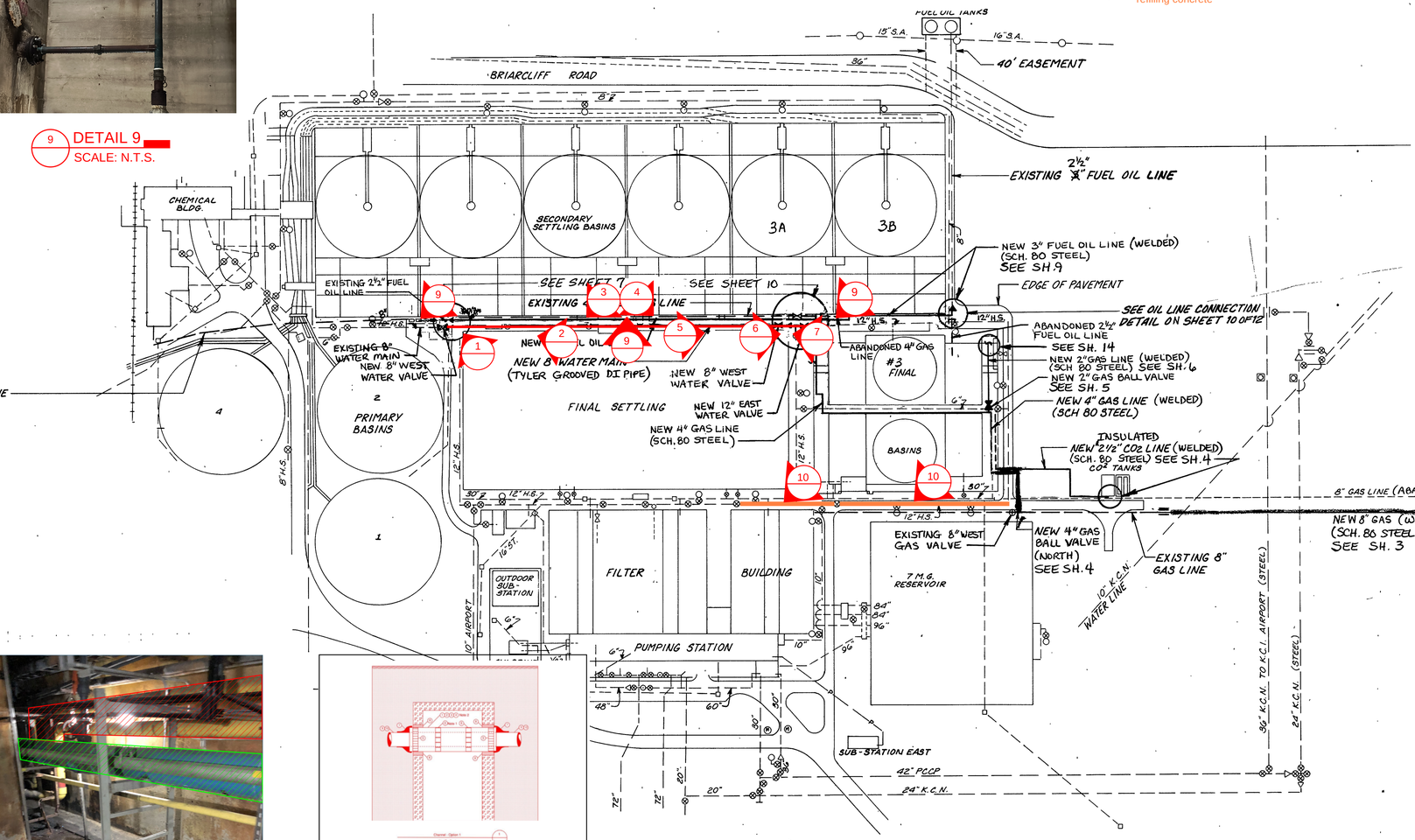
1 DETAIL 1
SCALE: N.T.S.

9 DETAIL 9
SCALE: N.T.S.



5 DETAIL 5
SCALE: N.T.S.

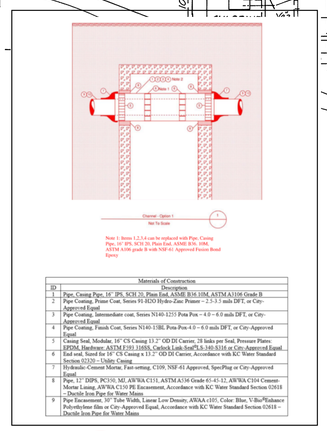
2 DETAIL 2
SCALE: N.T.S.



6 DETAIL 6
SCALE: N.T.S.

3 DETAIL 3
SCALE: N.T.S.

4 DETAIL 4
SCALE: N.T.S.



Channel - Option 1
Not To Scale

Note: 1- Items 1,2,3,4 can be replaced with Pipe, Casing Pipe, 16" IPS, SCH 20, Plain End, ASME B36.10M, ASTM A106 grade B with NSF-61 Approved Fusion Bond Epoxy

ID	Description
1	Pipe, Casing Pipe, 16" IPS, SCH 20, Plain End, ASME B36.10M, ASTM A106 Grade B
2	Pipe Coating, Prime Coat, Series 91-H2O Hydro-Zinc Primer – 2.5-3.5 mils DFT, or City-Approved Equal
3	Pipe Coating, Intermediate coat, Series N140-1233 Pota Pox – 4.0 – 6.0 mils DFT, or City-Approved Equal
4	Pipe Coating, Finish Coat, Series N140-1380, Pota Pox 4.0 – 6.0 mils DFT, or City-Approved Equal
5	Casing Seal, Modular, 16" CS Casing 13.2" OD DI Carrier, 28 links per Seal, Pressure Plates: EPDM, Hardware: ASTM F593 316SS, Carlock Link-Seal®LS-340-S316 or City-Approved Equal
6	End seal, Sand for 16" CS Casing x 13.2" OD DI Carrier, Accordance with KC Water Standard Section 02320 – Under, Casing
7	Hydraulic Cement Morter, Fast-setting, C109, NSF-61 Approved, SpecPlug or City-Approved Equal
8	Pipe, 12" DIPS, PC350, MJ, AWWA C151, ASTM A156 Grade 65-45-12, AWWA C104 Cement-Morter Lining, AWWA C150 PE Encasement, Accordance with KC Water Standard Section 02618 – Ductile Iron Pipe for Water Mains
9	Pipe Encasement, 30" Tube Width, Linear Low Density, AWWA c105, Color: Blue, V-Bio®Balance Polyethylene film or City-Approved Equal, Accordance with KC Water Standard Section 02618 – Ductile Iron Pipe for Water Mains

10 DETAIL 10
SCALE: N.T.S.

7 DETAIL 7
SCALE: N.T.S.

517421

E-2520 SEC.11 TP.50 R.33 C-24A

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