



The City of Canton

Invitation to Bid

City of Canton, Ohio
Purchasing Department
218 Cleveland Ave. SW, 4th floor
Canton, Ohio 44702

Sugarcreek Water Treatment Plant Filter Backwash Dechlorination Facility
Item/Project

Water Department

Responsible Department

2:00:00 PM, 3/16/2021

Bids Due

Bid Proposal Submitted By:

Company Name

Street Address

City

State

Zip

Contact Person

Phone No.

Email Address



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Bidder's Checklist: The completed Bid Form shall be accompanied by the following completed documents:

- _____ [Pre-Bid Substitution](#), if any proposed substitutes have been pre-approved.
- _____ [Bid Guaranty and, if applicable Contract Bond](#)
- _____ [Contractor's Qualification Statement](#)
- _____ [Contractor's List of Subcontracted Work Categories](#)
- _____ [A list identifying its DBE subcontractors and participation rates as a percentage of the Contract Price](#), and if the DBE participation goal has not been met, certification of good faith efforts to meet the DBE participation goal.
- _____ The Project Labor Agreement (PLA) Letter of Assent (See Appendix A).
- _____ If this project is funded in whole or part by the [Ohio Public Works Commission](#), then certification of agreement and compliance with certain statements and covenants regarding Bidder's subscription to the State's Equal Employment Opportunity Requirements for State-assisted Construction Contracts.



Legal Notice

Sealed bids will be received by the City of Canton (the "City"), as provided in this notice for the Sugarcreek Water Treatment Plant Filter Backwash Dechlorination Facility Project (the "Project"), Ordinance 13/2021. Contract documents, which include additional details of the Project, are on file and available from the City of Canton's web site (<https://cantonohio.gov/448/Purchasing-Procurement>).

Bids shall be enclosed in a sealed envelope addressed to the City of Canton, 218 Cleveland Ave. SW, Purchasing Dept/Fourth Floor, Canton, Ohio 44702 and plainly marked on the outside "Sugarcreek Water Treatment Plant Filter Backwash Dechlorination Facility PROJECT BID." Bids will be received on or before 2:00 PM, local time, 3/16/2021 and opened shortly thereafter.

Questions regarding plans and specifications should be addressed in writing to Purchasing Department, at purchasing@cantonohio.gov.

All bids must include a Bid Guaranty, as described in the Instructions to Bidders. Prevailing wage rates apply. All bidders will be required to comply with the City Contract Compliance Program regarding equal employment opportunity. After submission and opening, no bidder may withdraw its bid within 60 days after the opening; the City reserves the right to waive irregularities, reject any or all bids, and conduct necessary investigations to determine bidder responsibility.

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INSTRUCTIONS TO BIDDERS

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A. BIDDER'S PLEDGE AND AGREEMENT

1. Each Bidder acknowledges that this is a public project involving public funds and that the Owner expects and requires that each successful Bidder adhere to the highest ethical and performance standards. Each Bidder by submitting a bid pledges and agrees that (a) it will act at all times with absolute integrity and truthfulness in its dealings with the Owner and the Engineer, (b) it will use its best efforts to cooperate with the Owner and the Engineer and all other Contractors on the Project and at all times will act with professionalism and dignity in its dealings with the Owner, Engineer, and other Contractors, (c) it will assign only competent supervisors and workers to the Project, each of whom is fully qualified to perform the tasks that are assigned to him/her, and (d) it has read, understands and will comply with the terms of the Contract Documents.

B. EXAMINATION OF CONTRACT DOCUMENTS AND SITE CONDITIONS AND RELIANCE UPON TECHNICAL DATA

1. Each Bidder shall have a competent person carefully and diligently review each part of the Contract Documents, including the Divisions of the Specifications and parts of the Drawings that are not directly applicable to the Work on which the Bidder is submitting its bid. By submitting its bid, each Bidder represents and agrees, based upon its careful and diligent review of the Contract Documents, that it is not aware of any conflicts, inconsistencies, errors, or omissions in the Contract Documents for which it has not notified the Owner in writing at least ten (10) days prior to the bid opening. If there are any such conflicts, inconsistencies, errors, or omissions in the Contract Documents, the Bidder (i) will provide the labor, equipment, or materials of the better quality or greater quantity of Work and/or (ii) will comply with the more stringent requirements. The Bidder will not be entitled to any Change Order, additional compensation, or additional time on account of such conditions for any conflicts, inconsistencies, errors, or omissions that would have been discovered by such careful and diligent review, unless it has given prior written notice to the Owner.
2. Each Bidder shall have a competent person carefully and diligently inspect and examine the entire site and the surrounding area, including all parts of the site applicable to the Work for which it is submitting its bid, including location, condition, and layout of the site and the location of utilities, and carefully correlate the results of the inspection with the requirements of the Contract Documents. The Bidder's bid shall include all costs attributable to site and surrounding area conditions that would have been discovered by such careful and diligent inspection and examination of the site and the surrounding area, and the Bidder shall not be entitled to any Change Order, additional compensation, or additional time on account of such conditions.
3. The Bidder may rely upon the general accuracy of any technical data identified in the Owner-Contractor Agreement (e.g., any soils exploration reports, soil boring logs, site survey, or abatement reports) in preparing its bid, but such technical data are not part of the Contract Documents. Except for the limited reliance described in the preceding sentence, Bidder may not, if awarded a contract for the Work, rely upon or make any Claim against the Owner or Engineer, or any of their agents or employees, with respect to any of the following:
 - a. the completeness of such reports and drawings for Bidder's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by the successful Bidder and safety precautions and programs incident thereto; or



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- b. any interpretation by the successful Bidder of or conclusion drawn from any technical data or any such other data, interpretations, opinions, or information. For example, all interpolations and extrapolations of data performed by the Bidder to estimate locations or quantities of subsurface strata are independent factual assumptions, which Owner does not warrant.
4. Each Bidder will be deemed to have actual knowledge of all information provided or discussed at the pre-bid meeting.

C. OWNER & ENGINEER

1. The Owner is:

The City of Canton
218 Cleveland Avenue SW
Canton, OH 44702
Telephone: 330.489.3245
Fax: 330.489.3499

The Owner's Representative is:

Brent Burrier

2. The Design Engineer for the Project is:

Burgess & Niple, Inc
100 W. Erie Street
Painesville, Ohio 44077

D. PROJECT

1. The Project and Work for the Project consists of all labor, materials, equipment, and services necessary for construction of the project identified as **Sugarcreek Water Treatment Plant Filter Backwash Dechlorination Facility Project** ("the Project"), all in accordance with the Drawings and Specifications prepared by the Engineer and/or Owner. The Project must be substantially complete by the Date for Substantial Completion set forth in Section Q below.
2. The Mayor **has** determined that a Project Labor Agreement ("PLA") will advance the City's procurement interest in cost, efficiency, and quality while promoting labor-management stability as well as compliance with applicable legal requirements governing safety and health, equal employment opportunity, labor and employment standards, and other related matters. Any such PLA shall be negotiated by the Mayor of the Owner with the East Central Ohio Building and Construction Trades Council and its affiliated local unions, or said Council's successor. The successful Bidder shall comply with and adhere to all of the provisions of any PLA for the Project.
3. A pre-bid conference will be held at **NA on NA at NA**.

E. WORK

1. This Project includes **Earthwork, asphalt, concrete, electrical, plumbing, building,** and the like as set forth in the Contract Documents.
2. Alternate No. 1 for this Project is **NA**.



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3. Alternate No. 2 for this Project is **NA**.
4. Only one contract will be issued by the Owner for constructing the Project, the General Contract, which will cover all scopes of work necessary to construct the Project.
5. The Contractor awarded the General Contract (General Contractor) will be responsible for the performance and coordination of any and all subcontractors and suppliers either directly or indirectly contracted with the General Contractor.
6. Owner will provide Bidders access to the Project site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes, clean up, and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable laws, regulations and Owner's policies relative to excavation and utility locates. Bidders may contact **Brent Burrier**, The City of Canton, at **brent.burrier@cantonohio.gov** or **330-438-6569** if they have any interest in accessing the Project site, independent of any pre-bid meeting.

F. ESTIMATE OF COST

1. The total estimated construction cost for the Base Bid Work for the Project for which bids are being solicited at this time is **\$163,500.00**.

The estimated cost for Alternate 1 - **NA** is: **\$-**.

The estimated cost for Alternate 2 - **NA** is: **\$-**.

G. CONTRACT DOCUMENTS

The Contract Documents consist of the documents listed in Section 1 of the Owner-Contractor Agreement.

Bidders may view and download copies of the Contract Documents from The City of Canton Purchasing web site at <https://cantonohio.gov/448/Purchasing-Procurement>, which is the only authorized source of the Contract Documents. The City of Canton's sourcing tool, Vendor Registry, will maintain the Bidder's list and will provide notice and copies of Addenda as issued. It is the responsibility of any person or organization interested in a hard copy of the Contract Documents to pay all costs associated with printing.

Bidders shall use complete sets of Contract Documents in preparing bids. Neither the Owner nor the Design Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Contract Documents.

The Owner, in making the Contract Documents available on the above terms, does so only for the purpose of obtaining bids on the Work and does not confer a license or grant for any other use.

H. PREPARATION OF BIDS

1. All bids must be submitted on the "Bid Form" furnished with the Contract Documents.
2. All blank spaces shall be filled in, in ink or typewritten, in words and figures, and in figures only where no space is provided for words, and signed by the Bidder. The wording on the Bid Form shall be used without change, alteration, or addition. Any change in the wording or omission of specified accompanying documents may cause the bid to be rejected. If there is an inconsistency or conflict in the Bid, the lowest amount shall control, whether expressed in numbers or words.



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3. Bidders shall note receipt of Addenda on the Bid Form. If the Bidder fails to acknowledge receipt of each Addendum, the Bid shall be deemed non-responsive, unless the Bid amount clearly and unambiguously reflects receipt of the Addendum or the Addendum involves only a matter of form and does not materially affect the price, quantity or quality of the Work to be performed.
4. Each Bidder shall submit **an original** of its bid to the Owner. The Bid Form shall be signed with the name typed or printed below the signature. A Bid shall not be submitted by facsimile transmission or any other electronic means. A Bidder that is a corporation shall sign its bid with the legal name of the corporation followed by the name of the state of incorporation and the legal signature of an officer authorized to bind the corporation to a contract.
5. Each Bid shall be enclosed in a sealed opaque envelope with the Bidder's name and the title of the Project printed in the upper left hand corner and addressed as follows:

The City of Canton
ATTN: Purchasing/Bids
218 Cleveland Avenue SW
Canton, OH 44702

Bids must be received at the designated location for the bid opening before 2:00:00 PM, local time, on 3/16/2021.

6. The completed Bid Form shall be accompanied by the following completed documents:
 - a. Pre-Bid Substitution, if any proposed substitutes have been pre-approved. (See Section K, below.)
 - b. Bid Guaranty and, if applicable Contract Bond (See Paragraph H.8, below.)
 - c. Contractor's Qualification Statement (See Paragraph I.4, below.)
 - d. Contractor's List of Subcontracted Work Categories (See Paragraph I.5, below.)
 - e. A list identifying its DBE subcontractors and participation rates as a percentage of the Contract Price, and if the DBE participation goal has not been met, certification of good faith efforts to meet the DBE participation goal. (See Section W, below.)
 - f. The Project Labor Agreement (PLA) Letter of Assent (See Appendix A).
 - g. If this project is funded in whole or part by the Ohio Public Works Commission, then certification of agreement and compliance with certain statements and covenants regarding Bidder's subscription to the State's Equal Employment Opportunity Requirements for State-assisted Construction Contracts (See Section Y, below.)
7. The Bidder shall take the following precautions in preparing its bid:
 - a. Sign the bid and check to ensure all blank spaces have been filled in with requested information and that the specified accompanying documents (listed in Paragraph H.6 above) have been included in a sealed opaque envelope addressed as described in Paragraph H.5 above.



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- b. When the Bid Form provides for quoting either an addition or deduction for an Alternate item, indicate whether the sum named is an addition or deduction. If it is not indicated, it will be conclusively presumed that the amount is a deduction.
 - c. When the Bid Form provides for quoting a unit price, the Bidder should quote the unit price as set forth in the Contract Documents as described in Paragraph M.1 below.
 - d. When applicable, make sure that the Bid Guaranty is properly executed and signed by:
 - 1) The Bidder
 - 2) The Surety or Sureties
 - e. Make sure that the amount of the Bid Guaranty (if the Bid Guaranty is in the form of a certified check, letter of credit, or cashier's check) is for a specific sum in an amount as instructed in Paragraph H.8.a below. If the Bid Guaranty is in the form of the Bid Guaranty and Contract Bond, the amount may be left blank; if an amount is inserted, it must equal the total of the base bid and all add alternates included. If inserted, then the failure to state an amount equal to the total of the base bid and all add alternates shall make the bid non-responsive if the Owner selects alternates not included in the amount.
 - f. Make sure that the appropriate bid package and scope of work is inserted in the correct space on the Bid Guaranty and Contract Bond Form. Failure to include work covered by the bid submitted may make the bid non-responsive.
8. Bonds and Guarantees
- a. **Bid Guaranty:** Bidder shall furnish a Bid Guaranty, as prescribed in Sections 153.54, 153.57, and 153.571 of the Ohio Revised Code, in the form of either: (1) a bond for the full amount of the bid in the form of the Bid Guaranty and Contract Bond included in the Contract Documents; or (2) a certified check, cashier's check, or irrevocable letter of credit in a form satisfactory to the Owner in an amount equal to 10% of the bid. Bid amount shall be the total of all sums bid, including all add alternatives, but excluding all deduct alternatives. **NOTE: AIA or EJCDC Bid Bond forms are not acceptable.**
 - b. **Contract Bond:** The successful Bidder, who, as a Bid Guaranty, submits a certified check, cashier's check, or irrevocable letter of credit in an amount equal to 10% of the bid, shall furnish a Contract Bond in the form included in the Contract Documents in an amount equal to 100% of the Contract Sum. **NOTE: AIA or EJCDC Bond forms are not acceptable.**
 - c. The bond must be issued by a surety company authorized by the Ohio Department of Insurance to transact business in the State of Ohio and acceptable to the Owner. The bond must be issued by a surety capable of demonstrating a record of competent underwriting, efficient management, adequate reserves, and sound investments. These criteria will be deemed to be met if the surety currently has an A.M. Best Company Policyholders Rating of "A-" or better and has or exceeds the



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Best Financial Size Category of Class VI. Other sureties may be acceptable to the Owner, in its sole discretion.

- d. All bonds shall be signed by an authorized agent of an acceptable surety and by the Bidder.
- e. Surety bonds shall be supported by credentials showing the Power of Attorney of the agent, a certificate showing the legal right of the Surety Company to do business in the State of Ohio, and a financial statement of the Surety.
- f. The Bid Guaranty, as applicable, shall be in the name of or payable to the order of the Owner.
- g. The name and address of the Surety and the name and address of the Surety's Agent must be typed or printed on each bond.

9. Permits

- a. Owner has obtained, or will obtain the following permits for the Project, as applicable:

East Central OH Building Authority Building Permit

- b. Contractor shall secure and pay for all other permits necessary to complete the Project. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

I. METHOD OF AWARD

1. All bids shall remain open for acceptance for sixty (60) days following the day of the bid opening, but the Owner may, in its sole discretion, release any bid and return the Bid Guaranty prior to that date. The Bid Guaranty shall be subject to forfeiture, as provided in the Ohio Revised Code, if a bid is withdrawn during the period when bids are being held.
2. The Owner reserves the right to reject any, part of any, or all bids and to waive any informalities and irregularities. The Bidder expressly acknowledges this right of the Owner to reject any or all bids or to reject any incomplete or irregular bid. Bidders must furnish all information requested on the Bid Form. Failure to do so may result in disqualification of the bid.
3. Determination of the Lowest and Best Bid. Subject to the right of the Owner to reject any or all bids, pursuant to the Codified Ordinances of Canton Chapters 105, 182, and 507, the Owner will award the Contract for the Work to the bidder submitting the lowest and best bid, taking into consideration accepted alternates. In evaluating bids, the Owner will consider the qualifications of the Bidders, whether or not the bids comply with the prescribed requirements, and alternates and unit prices, if requested, on the Bid Form. The Owner may also consider the qualifications and experience of subcontractors and suppliers. The Owner may conduct such investigations as are deemed necessary to establish the qualifications and financial ability of the Bidder and its subcontractors and suppliers. The factors the Owner may consider in determining which bid is the lowest and best include the factors set forth below, including the Additional Criteria. Depending upon the type of work, the Owner, in its discretion, may also consider other essential factors, as the Owner may determine and as are included in the Specifications. The Owner, in its discretion, may consider and give such weight to these criteria as it deems appropriate. The Owner, in its discretion, reserves the right to request additional



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information and documentation relating to these criteria from Bidders after the bid opening.

- a. Work to be subcontracted. The Bidder must identify all work to be subcontracted. See paragraph I.5 below. All subcontractors are subject to the approval of the Owner based on the criteria set forth in this Section I.
- b. The Bidder's work history. The Bidder should have a record of consistent customer satisfaction and of consistent completion of projects, including projects that are comparable to or larger and more complex than the Owner's Project, on time and in accordance with the applicable Contract Documents, and based upon the Bidder's claims history. If the Bidder's management operates or has operated another construction company, the Owner may consider the work history of that company in determining whether the Bidder submitted the lowest and best bid.

The Owner will consider the Bidder's prior experience on other projects of similar scope and/or complexity including prior projects with the Owner and/or Design Professional, including the Bidder's demonstrated ability to complete its work on these projects in accordance with the Contract Documents and on time, and will also consider its ability and capacity to perform a substantial portion of the project with its own forces and its ability to work with the Owner and Engineer as a willing, cooperative, and successful team member. Bringing overstated claims, an excessive number of claims, acting uncooperatively, and filing lawsuits against project owners and/or their design professionals on prior projects of similar scope and/or complexity will be deemed evidence of a Bidder's inability to work with the Owner and Engineer as a willing, cooperative, and successful team member.

The Bidder authorizes the Owner and its representatives to contact the owners and design professionals (and construction managers, if applicable) on projects on which the Bidder has worked and authorizes and requests such owners and design professionals (and construction managers) to provide the Owner with a candid evaluation of the Bidder's performance. By submitting its bid, the Bidder agrees that if it or any person, directly or indirectly, on its behalf or for its benefit brings an action against any of such owners or design professionals (or construction managers) or the employees of any of them as a result of or related to such candid evaluation, the Bidder will indemnify and hold harmless such owners, design professionals (and construction managers) and the employees of any of them from any claims, whether or not proven, that are part of or are related to such action and from all legal fees and expenses incurred by any of them arising out of or related to such legal action. This obligation is expressly intended for the benefit of such owners, design professionals (and construction managers), and the employees of each of them.

- c. The Bidder's prior history regarding timeliness of performance, quality of work, the Bidder's history of filing claims and having claims filed against it, extension requests, fines and penalties imposed and payments thereof, and contract defaults, with explanations.
- d. The Bidder's compliance with federal, state, and local laws, rules, and regulations, including but not limited to the Occupational Safety and Health Act, Ohio Prevailing Wage laws, Davis Bacon, and Ohio ethics laws.
- e. The Bidder's prior experience with similar work on comparable or more complex projects.



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- f. The number of years the Bidder has been actively engaged as a contractor in the construction industry.
 - g. The Bidder's recent experience record in the construction industry, including the original contract price for each construction job undertaken by the bidder, the amount of any change orders or cost overruns on each job, the reasons for the change orders or cost overruns, and the bidder's record for complying with and meeting completion deadlines on construction projects.
 - h. A public entities' determination, within the previous five years, that the Bidder was not a responsible bidder, the reasons given by the public entity, and the Bidder's explanation thereof.
 - i. The Bidder's financial ability to complete the Contract successfully and on time without resort to its Surety.
 - j. Financial responsibility demonstrated by the Bidder and whether Bidder possesses adequate resources and availability of credit, the means and ability to procure insurance and acceptable performance bonds required for the Project and whether any claims have been made against performance bonds secured by the bidder on other construction projects.
 - k. Any suspension or revocations of any professional license of any director, officer, owner, or managerial employees of the Bidder, to the extent that any work to be performed on this Project is within the field of such licensed profession.
 - l. The Bidder's equipment and facilities.
 - m. The size and experience of the Bidder's work force and the Bidder's ability to complete the Contract successfully and on time.
 - n. The experience and the continuity of the Bidder's work force including the project manager and project superintendent's tenure with the Bidder.
 - o. The Bidder's participation in a drug-free workplace program acceptable to the Owner, and the Bidder's record for both resolved and unresolved findings of the Auditor of State for recovery as defined in Section 9.24 of the Ohio Revised Code.
 - p. The Owner's prior experience with the Bidder's surety.
 - q. The Bidder's interest in the Project as evidenced by its attendance at any pre-bid meetings or conferences for bidders.
 - r. The adequacy, in numbers and experience, of the Bidders' work force to complete the Contract successfully and on time.
 - s. The foregoing information with respect to each of the Subcontractors and Suppliers that the Bidder intends to use on the Project.
4. Qualifications Statement. Each Bidder will submit with its bid a completed Contractor Qualifications Statement, which is included with the Contract Documents, and thereafter provide the Owner promptly with such additional information as the Owner may request regarding the Bidder's qualifications. A Bidder shall submit any requested additional information within three (3) business days of the date on the request.



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5. List of Subcontracted Work Categories. Each Bidder will submit with its bid a completed list of Subcontracted Work Categories, which is included with the Contract Documents, and thereafter provide the Owner promptly with such additional information as the Owner may request regarding the Bidder's qualifications. A Bidder shall submit any requested information within three (3) business days of the date on the request.

6. Additional Criteria for Determining Lowest and Best Bid. Pursuant to the Codified Ordinances of the City of Canton, Chapter 105, the Owner, in its discretion, may consider any or all of the Additional Criteria below in determining which bid is lowest and best.
 - a. Any OSHA violations within the previous three years, as well as all notices of OSHA citations filed against the Bidder in the same three year period, together with a description and explanation of remediation or other steps taken regarding such violations and notices of violation.
 - b. Any violations within the previous five years pertaining to unlawful intimidation or discrimination against any employee by reason of race, creed, color, disability, gender, or national origin, and/or violation of any employee's civil or labor rights or equal employment opportunities.
 - c. Any litigation in which the Bidder has been named as a defendant or third party defendant in an action involving a claim for personal injury or wrongful death arising from performance of work related to any project in which it has been engaged within the previous five years. Bidders shall provide copies of pleadings.
 - d. Allegations of violations of the prevailing wage law and any other state or federal labor law, including, but not limited to, child labor violations, failure to pay wages, or unemployment insurance tax delinquencies or unfair labor practices within the past five years.
 - e. Violations of the workers compensation law.
 - f. Any criminal convictions or criminal indictments, involving the Bidder, its officers, directors, owners, and/or managers within the past five years.
 - g. Any violation within the past five years or pending charges concerning federal, state, or municipal environmental and/or health laws, codes, rules, and/or regulations.
 - h. Documentation that the Bidder provides health insurance and pension benefits to its employees.
 - i. Whether the Bidder participates in a bona fide apprenticeship program that is approved by the Ohio State Apprenticeship Council and the United States Department of Labor.
 - j. Whether the Bidder has adopted and implemented a comprehensive drug and alcohol testing program for its employees.
 - k. Whether the Bidder's employees are OSHA-10 and/or OSHA-30 certified.
 - l. The Bidder's commitment to comply with the Owner's Contract Compliance Program regarding equal employment opportunity. Each Bidder shall file contract employment reports with the Owner's contracting agency or as may be directed by the Owner or its representative. Such contract employment reports shall include such information as to the employment practices, policies, programs, and statistics of the Bidder and shall be in such form as the Owner may prescribe.



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- m. The foregoing information with respect to each of the Subcontractors and Suppliers that the Bidder intends to use on the Project.
7. The failure to submit information that Owner has the right to receive under these Instructions to Bidders on a timely basis may result in the determination that the Bidder has not submitted the lowest and best bid.
8. By submitting its bid, the Bidder agrees that the Owner's determination of which bidder is the lowest and best bidder shall be final and conclusive, and that if the Bidder or any person on its behalf challenges such determination in any legal proceeding, the Bidder will indemnify and hold the Owner and its employees and agents harmless from any claims included or related to such legal proceeding, and from legal fees and expenses incurred by the Owner, its employees, or agents that arise out of or are related to such challenge.
9. After bid opening, within three (3) business days of a request made by the Owner, the apparent low Bidder and any other Bidder so requested by the Owner must submit the following:

For all subcontracts with an estimated value of at least \$50,000, a list of all Subcontractors that the Bidder will use to construct the Project, as well as an indication of whether or not the Bidder has ever worked with a proposed Subcontractor before, including the following information for the three most recent projects on which the Bidder and each Subcontractor have worked together:

- i. Project Owner
- ii. Project Name
- iii. Subcontract Scope
- iv. Subcontract Value
- v. Owner's contact name and phone number.

If Bidder and a proposed Subcontractor have not worked together on at least three projects in the past five years, Bidder must submit the information set forth above for the three most recent similar projects to the Project that a proposed Subcontractor has worked on.

The above Subcontractor information, as well as the criteria set forth in Paragraph I.3 herein, as it pertains to each Subcontractor may be used in the Owner's determination of the lowest and best bid.

Once a Bidder identifies its proposed Subcontractors as set forth in this Paragraph I.9, the list shall not be changed unless written approval or direction for the change is made by Owner.

10. Additional Post-Bid Submittals
 - a) Affidavit as to Personal Property Taxes. The successful Bidder shall submit, prior to the time of the entry into the Contract, an affidavit in the form required by Section 5719.042, Ohio Revised Code, regarding the status of the Bidder's personal property taxes. A copy of the affidavit form is included with the Contract Documents.
11. The Owner reserves the right to disqualify bids, before or after opening, upon evidence of collusion with intent to defraud or other illegal practices on the part of the Bidder.



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12. Award of Contract. The award of the Contract will only be made pursuant to approval of the City's Board of Control.

J. EXECUTION OF CONTRACT

1. Within the time designated by the Owner after award of the Contract, the successful Bidder shall execute and deliver to the Owner the required number of copies of the Owner-Contractor Agreement, in the form included in the Contract Documents, and all accompanying documents requested, including, but not limited to, a Contract Bond (if applicable), insurance certificates, and a valid Workers' Compensation Certificate. The successful Bidder shall have no property interest or rights under the Owner-Contractor Agreement until the Agreement is executed by the Owner.

K. SUBSTITUTIONS/NON-SPECIFIED PRODUCTS

1. Certain brands of material or apparatus may be specified. Should this be the case, each bid will be based on these brands, which may be referred to in the Contract Documents as Standards. The use of another brand (referred to as a substitution or proposed equal in the Contract Documents, when a bidder or the contractor seeks to have a different brand of material or apparatus than that specified approved by the Owner of use in the Project) may be requested as provided herein. Substitutions, however, will not be considered in determining the lowest and best bid.
2. The products specified in the Contract Documents establish a standard of required function, dimension, appearance, and quality.
3. Bidders wishing to obtain approval to bid non-specified products shall submit written requests to the Owner a minimum of seven (7) working days before the bid date and hour. To facilitate the submission of requests, a Substitution Form is included in the Contract Documents. The Bidder shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution, including the name of the proposed manufacturer and/or product and a complete description of the product including the manufacturer's name and model number or system proposed, drawings, product literature, performance and test data, color selections or limitations, and any other information necessary for evaluation. Include a statement including any changes in other materials, equipment, or other work that would be required if the proposed product is incorporated in the work. The burden of proof of the merit of the proposed product is on the proposer. The Owner's decision on approval of a proposed product will be final.

The following will be cause for rejection of a proposed substitution:

- a. Requests submitted by subcontractors, material suppliers, and individuals other than Bidders;
 - b. Requests submitted without adequate documentation;
 - c. Requests received after the specified cut-off date;
 - d. Requests, which in the sole discretion of the Owner, do not offer a sufficient benefit to the Project.
4. When the Owner approves a product submission before receipt of bids, the approval will be included in an Addendum, and Bidders may include the pricing of this product in their bid. Bidders shall not rely on approvals made in any other manner.



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5. In proposing a non-specified product or a substitution, the Bidder represents and warrants that each proposed product will not result in any changes to the Project, including changes to the Work or other contractors, or any decrease in the performance of any equipment or systems to be installed in the Project and agrees to pay any additional costs incurred by the Owner and the Owner's consultants as a result of a non-specified or substitute product that is accepted.
6. If an addendum is issued approving a substitution for a specified Standard, any Bidder proposed to use said substitution must indicate so with its Bid, using the form provided.
7. Following the award of the Contract, there shall be no substitution for specified products, except pursuant to a Change Order. The Owner in its sole discretion may decline to consider a substitution for a Change Order.
8. The Owner reserves the right to value engineer any item within the specifications if it is deemed to be in the best interest of the Owner.

L. ALTERNATES

1. The Owner may request bids on alternates. At the time of awarding the Contract, the Owner will select or reject alternates as it determines is in its best interest. A Bidder's failure to include on its Bid Form the cost of an alternate selected by the Owner and applicable to the Bidder's work shall render the bid non-responsive and be grounds for the rejection of the bid. Otherwise, the failure to include the cost of an alternate will not be deemed material.
2. The Bidder acknowledges that although there is an estimate for the cost of the Project, the market conditions may and frequently do result in the estimate being different from the sum of the bids received, either higher or lower. The Bidder understands that the Owner may include alternates, which may include deduct alternates as well as add alternates, to give it flexibility to build the Project with the funds available. The Bidder further understands and acknowledges that use of add and deduct alternates is a long held customary practice in the construction industry in the State of Ohio. The Bidder also acknowledges that the Owner will not make a decision about the alternates on which to base the award of contracts until the bids are received, and the Owner can compare its available funds with the base bids and the cost or savings from selecting different alternates. The Bidder understands that the award to the Bidder submitting the lowest and best bid will be based on the base bid plus selected alternates, and may result in an award to a Bidder other than the Bidder that submitted the lowest base bid.

M. UNIT PRICES

1. Where unit prices are requested in the Bid Form the Bidder should quote a unit price. Unless otherwise expressly provided in the Contract Documents, such unit prices shall include all labor, materials, and services necessary for the timely and proper installation of the item for which the unit prices are requested. The unit prices quoted in the bid shall be the basis for any Change Orders entered into under the Owner-Contractor Agreement, unless the Owner determines that the use of such unit prices will cause substantial inequity to either the Contractor or the Owner.

N. ADDENDA

1. All questions should be submitted in writing at least five (5) business days prior to the bid opening. This is 3/9/2021, 2:00:00 PM. The Owner reserves the right to issue Addenda changing, altering, or supplementing the Contract Documents prior to the time set for receiving bids. The Owner will issue the Addenda to clarify bidders' questions and/or to change, alter, or supplement the Contract Documents.



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2. Any explanation, interpretation, correction, or modification of the Contract Documents will be issued in writing in the form of an Addendum, which shall be the only means considered binding; explanations, interpretations, etc., made by any other means shall NOT be legally binding. All Addenda shall become a part of the Contract Documents.
3. All Addenda will be issued, except as hereafter provided, via the current City bid tool at least seventy-two (72) hours prior to the published time for the opening of bids, excluding Saturdays, Sundays, and legal holidays. If any Addendum is issued within such seventy-two (72) hour period, then the time for opening of bids shall be extended one (1) week with no further advertising of bids required.
4. Copies of each Addendum will be posted via the Owner's current bid tool and it is the responsibility of the bidder or any other interested party to check the bid tool for any updates or addenda. Receipt of Addenda shall be indicated by Bidders in the space provided on the Bid Form. Bidders are responsible for acquiring issued Addenda in time to incorporate them into their bid. Bidders should check the Owner's bid tool prior to the bid opening to verify the number of Addenda issued.
5. Each Bidder shall carefully read and review the Contract Documents and immediately bring to the attention of the Owner any error, omission, inconsistency, or ambiguity therein.
6. If a Bidder fails to indicate receipt of all Addenda through the last Addendum issued by the Owner on its Bid Form, the bid of such Bidder will be deemed to be responsive only if:
 - a. The bid received clearly indicates that the Bidder received the Addendum, such as where the Addendum added another item to be bid upon and the Bidder submitted a bid on that item; or
 - b. The Addendum involves only a matter of form or is one which has either no effect or has merely a trivial or negligible effect on price, quantity, quality, or delivery of the item bid upon.

O. INTERPRETATION

1. If a Bidder contemplating submitting a bid for the proposed Project is in doubt as to the true meaning of any part of the Contract Documents, it may submit a written request for an interpretation thereof to the Owner at purchasing@cantonohio.gov. Requests received fewer than 5 days prior to bid opening may not be answered. Any interpretation of the proposed documents will be made by Addendum only and will be made available by the City's web tool. The Owner will not be responsible for any other explanation or interpretation of the proposed documents.
2. In interpreting the Contract Documents, words describing materials that have a well-known technical or trade meaning, unless otherwise specifically defined in the Contract Documents, shall be construed in accordance with the well-known meaning recognized by the trade.
3. Bidders are responsible for notifying the Owner in a timely manner of any ambiguities, inconsistencies, errors, or omissions in the Contract Documents. The Bidder shall not, at any time after the execution of the Contract, be compensated for a claim alleging insufficient data, incomplete Contract Documents, or incorrectly assumed conditions regarding the nature or character of the Work, if no request was made by the Bidder prior to the bid opening.



P. STATE SALES AND USE TAXES

1. The Owner is a political subdivision of the State of Ohio and is exempt from taxation under the Ohio Sales Tax and Use Tax Laws. Building materials that the successful Bidder purchases for incorporation into the Project will be exempt from state sales and use taxes if the successful Bidder provides a properly completed Ohio Department of Taxation Construction Contract Exemption Certificate to the vendors or suppliers when the materials are acquired. The Owner will execute properly completed certificates on request.

Q. DATE FOR SUBSTANTIAL COMPLETION/DATE FOR FINAL COMPLETION/LIQUIDATED DAMAGES

1. Dates for Substantial Completion. The Contract Time shall run from the date of the Notice to Proceed or if there is no Notice to Proceed from the Effective Date of the Owner-Contractor Agreement. The Date for Substantial Completion and the Contract Time may be extended only by Change Order. **By submitting its Bid, each Bidder agrees that the period for performing its Work is reasonable.**

- a. Date for Overall Project Substantial Completion. The successful Bidder shall have all of its Work on the Project Substantially Complete (as Substantial Completion is defined in the Contract Documents) by the following date as applicable to the Bidder's scope of work.

Date for Substantial Completion (aka Contract Time) expressed as calendar days from Notice to Proceed:

189 calendar days

2. Liquidated Damages.
 - a. Overall Project Substantial Completion. If the successful Bidder does not have its Work Substantially Complete by its Date for Substantial Completion or Finally Complete within thirty (30) calendar days of achieving Substantial Completion, whichever may be applicable, the successful Bidder shall pay the Owner and the Owner may set off from amounts otherwise due the successful Bidder Liquidated Damages. The daily amounts of Liquidated Damages for Overall Project Substantial Completion are set forth in the tables included in the Owner-Contractor Agreement. The total amount of Liquidated Damages will be calculated based on the total number of calendar days beyond the Date for Substantial Completion that the Bidder's Work is not Substantially Complete or to the extent that its Work is not Finally Complete more than thirty (30) calendar days after the Substantial Completion of its Work, i.e., number of late days times the per diem rate(s) for Liquidated Damages in the tables.
3. The Bidder acknowledges and agrees, by submitting its bid for the Work and entering into a Contract with the Owner, that such amounts of Liquidated Damages represent a reasonable estimate of the actual damages for loss of or interference with the intended use of the Project that the Owner would incur if the Bidder's Work is not Substantially Complete by its Date for Substantial Completion and/or not Finally Complete by thirty (30) days of the Date of Substantial Completion. The Bidder further acknowledges, agrees and understands that it may seek an extension of the Contract Time (and its Date for Substantial Completion) to avoid or reduce Liquidated Damages by properly following the Claim procedures in the Contract Documents.



R. OWNER'S RIGHT TO WAIVE DEFECTS AND IRREGULARITIES

1. The Owner reserves the right to waive any and all irregularities provided that the defects and irregularities do not affect the amount of the bid in any material respect or otherwise give the Bidder a competitive advantage.

S. MODIFICATION/WITHDRAWAL OF BIDS

1. Modification. A Bidder may modify its bid by written communication to the Owner at any time prior to the scheduled closing time for receipt of bids, provided such written communication is received by Owner prior to the bid deadline. The written communication shall not reveal the bid price, but should provide the addition or subtraction or other modification so that the final prices or terms will not be known until the sealed bid is opened. If the Bidder's written instructions with the change in bid reveal the bid amount in any way prior to the bid opening, the bid may be rejected as non-responsive.
2. Withdrawal Prior to Bid Deadline. A Bidder may withdraw its bid at any time for any reason prior to the bid deadline for the opening of bids established in the Legal Notice. The request to withdraw shall be made in writing to and received by the Owner prior to the time of the bid opening.
3. Withdrawal after Bid Deadline.
 - a. All bids shall remain valid and open for acceptance for a period of at least 60 days after the bid opening; provided, however, that a Bidder may withdraw its bid from consideration after the bid deadline when all of the following apply:
 - (1) the price bid was substantially lower than the other bids;
 - (2) the reason for the bid being substantially lower was a clerical mistake, rather than a mistake in judgment, and was due to an unintentional and substantial error in arithmetic or an unintentional omission of a substantial quantity of work, labor, or material;
 - (3) the bid was submitted in good faith; and
 - (4) the Bidder provides written notice to the Owner within two (2) business days after the bid opening for which the right to withdraw is claimed.
 - b. No bid may be withdrawn under this provision if the result would be the awarding of the contract on another bid for the bid package from which the Bidder is withdrawing its bid to the same Bidder.
 - c. If a bid is withdrawn under this provision, the Owner may award the Contract to another Bidder determined by the Owner to be the lowest and best bidder or the Owner may reject all bids and advertise for other bids. In the event the Owner advertises for other bids, the withdrawing Bidder shall pay the costs incurred in connection with the rebidding by the Owner, including the cost of printing new Contract Documents, required advertising, and printing and mailing notices to prospective bidders, if the Owner finds that such costs would not have been incurred but for such withdrawal.



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T. COMPLIANCE WITH APPLICABLE LAWS

1. By submitting a bid for Work on the Project, the Bidder acknowledges that it is in compliance with applicable federal, state, and local laws and regulations, including, but not limited to, the following:
 - a. Equal Employment Opportunity/Nondiscrimination. The Bidder agrees that if it is awarded a contract that in the hiring of employees for performance of work under the contract or any subcontract, neither it nor any subcontractor, or any person acting on its behalf or its subcontractor's behalf, by reason of race, creed, sex, disability as defined in Section 4112.01 of the Ohio Revised Code, or color, shall discriminate against any citizen of the state in the employment of labor or workers who are qualified and available to perform work to which the employment relates. The Bidder further agrees that neither it nor any subcontractor or any person on its behalf or on behalf of any subcontractor, in any manner, shall discriminate against or intimidate any employees hired for the performance of the work under the contract on account of race, creed, sex, disability as defined in Section 4112.01 of the Ohio Revised Code, or color.
 - b. Ethics Laws. The Bidder represents that it is familiar with all applicable ethics law requirements, including without limitation Sections 102.04 and 3517.13 of the Ohio Revised Code, and certifies that it is in compliance with such requirements.

U. FINDINGS FOR RECOVERY

1. By submitting its bid, each Bidder certifies for reliance of the Owner that it has no unresolved finding for recovery against it issued by the Auditor of the State of Ohio on or after January 1, 2001, except as permitted by Section 9.24 (F) of the Ohio Revised Code.

V. PREVAILING WAGES

1. The Project is a "Construction" project as defined in Section 4115.03 of the Ohio Revised Code. If the Project is defined as such as "Construction" project, the successful Bidder and all of its subcontractors, regardless of tier, will strictly comply with its obligation to pay a rate of wages on the Project not less than the rate of wages fixed for this Project under Section 4115.04 of the Ohio Revised Code. Additionally, the successful Bidder will comply with all other provisions of Chapter 4115 of the Ohio Revised Code.

W. DBE PARTICIPATION GOALS

1. Owner has established the following Disadvantaged Business Enterprise ("DBE") participation goal for the Project as a percentage of the Contract Price:

10%

2. Any Minority Business Enterprise ("MBE") or Woman-Owned Business Enterprise ("WBE") proposed to count towards the DBE participation goal must first be certified at bid time as an MBE or WBE under the Ohio Department of Administrative Services MBE Cross Certification Program (which includes MBEs and WBEs certified by the City of Canton), or certified as a DBE under Ohio's Unified Certification Program administered by the Ohio Department of Transportation.
3. **Documentation of DBE Participation**. Each Bidder must submit with its bid a list identifying its DBE subcontractors and participation rates as a percentage of the Contract Price.



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4. **Certification of Good Faith Efforts.** If a Bidder has not met the DBE participation goal, it must attach to its bid, a narrative (which may include exhibits) demonstrating the good faith efforts made by the Bidder to secure DBE participation in the Project. Good faith efforts include:
 - **Conducting outreach and recruiting activities;**
 - **Informing DBEs of the opportunity to participate in the Project at least 30 calendar days before the bid closes;**
 - **Considering subcontracting with a consortium of DBEs; and**
 - **Using the services and assistance of the Small Business Administration and Minority Development Agency of the U.S. Department of Commerce.**

Owner, in its sole discretion, will be the sole evaluator of whether any particular Bidders' efforts sufficiently demonstrate good faith efforts for securing DBE participation.

5. **Challenges to Owner's Discretion.** If any Bidder directly challenges, or indirectly challenges through contribution of money or other resources to a third party, Owner's discretion in determining any Bidder's compliance with the DBE goal stated in these Instructions to Bidders, or good faith efforts pertaining to same, that Bidder agrees to indemnify Owner for all claims, costs, losses and damages, including attorney and consultant fees, arising out of such challenge, should there be an adjudication by a court of competent jurisdiction that the Owner did not abuse its discretion in making its determination.
6. **Failure to Comply.** If a Bidder is awarded a contract for the Project, and later fails to fulfill its stated DBE participation goals, that Bidder agrees to indemnify Owner for all claims, costs, losses and damages, including attorney and consultant fees, arising out of such failure. That Bidder also agrees to cooperate with all reasonable requests to determine actual DBE participation, including but not limited to certifying actual participation and providing documentation in support of same.

X. OTHER LOCAL ORDINANCE REQUIREMENTS

1. Each Bidder, by the act of submitting its bid agrees to withhold all City income taxes due or payable under Chapter 182 of the Codified Ordinances of the City of Canton for wages, salaries, fees, and commissions paid to its employees and further agrees that any of its subcontractors shall be required to agree to withhold any such City income taxes due for services performed under this Agreement. Bidder agrees with the Owner regarding the manner of withholding of City income taxes as provided in Section 718.011(F) of the Ohio Revised Code. Municipal income tax withholding provisions of Section 718.011(B)(1) and 718.011(D) of the Ohio Revised Code shall not apply to qualifying wages paid to employees for work done or services performed or rendered inside the City or on City property. Each Bidder agrees to withhold income tax for the City from employees' qualifying wages earned inside the City or on City property, beginning with the first day of work done or services performed or rendered inside the City.
2. Each Bidder, by the act of submitting its bid agrees that all steel necessary in the construction of the Work performed under the Agreement shall be steel that is produced in the United States unless a specific product which is required is not produced by manufacturers in the United States in which event this prohibition does not apply.
3. Each Bidder, by the act of submitting its bid agrees that all materials used in the construction covered by the Agreement shall be purchased in the Canton area except such materials which are unavailable in the Canton area.
4. Chapter 105.12 – Local Bidder Preference.



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- a. The Board of Control, in determining the lowest and best bidder in the award of contracts to which this section is applicable, is authorized to award contracts to local bidders as hereinafter defined, whose bid is not more than five percent (5%) higher, subject to a maximum amount of twenty thousand dollars (\$20,000.00), than the lowest dollar bid submitted by non-local bidders. The Board of Control's decision in making such an award shall be final.
- b. For purposes of this section, "local bidder" means an individual or business entity which at the time of the award of the contract has a headquarters, division, sales office, sales outlet, manufacturing facility, or similar significant business-related location in Stark County, Ohio.
- c. All contract specifications and/or bid documents that are distributed by Canton for the purpose of soliciting bids for goods and/or services shall contain the following notice:

Prospective bidders will take notice that the City of Canton, in determining the lowest and best bidder in the award of this contract, may award a local bidder preference to any qualified bidder pursuant to Section 105.12 of the Codified Ordinances of the City of Canton. The determination of whether a bidder qualifies for the local preference shall be made by Board of Control. The Board's decision shall be final. A copy of Section 105.12 is attached.

- d. This section shall be applicable to all contracts for equipment, goods, machinery, materials, supplies, vehicles and/or services, which are purchased, leased and/or constructed at a cost in excess of fifty thousand dollars (\$50,000.00) and which require bidding pursuant to Ohio R.C. 735.05 through 735.09 and Ohio R.C. 737.03. (Ord. 115-2018. Passed 5-14-18.)
5. Each Bidder, by the act of submitting its bid agrees as follows during the performance of the Agreement:
 - a. The Contractor shall not discriminate against any employee or applicant for employment because of race, age, handicap, religion, color, sex, national origin, sexual orientation, or gender identity. The Contractor shall take affirmative action to insure that applicants are employed and that employees are treated during employment without regard to race, religion, color, sex, national origin, military status, sexual orientation, or gender identity. As used herein, the word "treated" shall mean and include without limitation the following: recruited, whether by advertising or other means; compensation, whether in the form of rates or pay or other forms of compensation; selected for training, including apprenticeship; promoted; demoted; upgraded; downgraded; transferred; laid off; and terminated. The Contractor agrees to and shall post in conspicuous places available to employees and applicants for employment notices to be provided by the contracting officers setting forth the provisions of this nondiscrimination clause.
 - b. The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, age, handicap, religion, color, sex, national origin, military status, sexual orientation, or gender identity.
 - c. The Contractor shall send to each labor union or representative of workers, with which he has a collective bargaining agreement or other contract or understanding, a notice advising the labor union or workers' representative of the Contractor's commitments under the equal opportunity clause of the Owner; and it shall post copies of the notice in conspicuous places available to employees and applicants for employment.



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- d. The Contractor shall submit in writing to the Owner its affirmative action plan, and each subcontractor and supplier of equipment or supplies shall submit to the Contractor its affirmative action plan. The responsibility for securing these affirmative action plans falls upon the Contractor and shall be on file at the office of the Contractor. The Contractor shall furnish all information and reports required by the Owner or its representative pursuant to the Contract Documents, and shall permit access to its books, records, and accounts by the contracting agency of the Owner and by the Executive Secretary of the Owner for purposes of investigation to ascertain compliance with the program.
- e. The Contractor shall take such action with respect to any subcontractor as the Owner may direct as a means of enforcing the provisions of this equal opportunity clause, including penalties and sanctions for noncompliance; provided, however, that in the event the Contractor becomes involved in or is threatened with litigation as is necessary to protect the interests of the Owner and to effectuate the Owner's equal opportunity program and, in the case of contracts receiving Federal assistance, the Contractor or the Owner may request the United States to enter into such litigation to protect the interests of the United States.
- f. The Contractor shall file and shall cause its subcontractors, if any, to file compliance reports with the Owner in the form and to the extent prescribed by the Owner or its representative. Compliance reports filed at such times as directed shall contain information as to the employment practices, policies, programs, and statistics of the Contractor and its subcontractors.
- g. The Contractor shall include the provisions of this equal employment opportunity clause in every subcontract or purchase order, so that such provisions will be binding upon each subcontractor or vendor.
- h. Refusal by the Contractor or subcontractor to comply with any portion of this program as herein stated and described will subject the offending party to any or all of the following penalties:
 - (1) Withholding of all future payments under the involved public contract to the Contractor in violation, until it is determined that the Contractor or subcontractor is in compliance with the provisions of the Agreement.
 - (2) Refusal of all future bids for any public contract with the Owner or any of its departments or divisions, until such time as the Contractor or subcontractor demonstrates that it has established and shall carry out the policies of the program as herein outlined.
 - (3) Cancellation of the public contract and declaration of forfeiture of the performance bond.
 - (4) In cases in which there is substantial or material violation or the threat of substantial or material violation of the compliance procedure or as may be provided by contract, appropriate proceedings may be brought to enforce these provisions, including enjoining within applicable laws of contractors, subcontractors, or other organizations, individuals, or groups who prevent, directly or indirectly, or seek to prevent, directly or indirectly, compliance with the policy as herein outlined.



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2. A Project Labor Agreement (PLA) has been required for this project (See Appendix A if applicable). Prevailing Wages are required for this Project (See Appendix B).

Y. OHIO PUBLIC WORKS COMMISSION FUNDING

1. **No** When this line is checked by the Owner, e.g. with an "X" or other mark, the Project is being funded in whole or part by the Ohio Public Works Commission ("OPWC"), and the requirements of the OPWC, attached to these Instructions to Bidders, apply.
2. The OPWC requirements include that the Bidder include with its bid certification of agreement and compliance with certain statements and covenants regarding its subscription to the State's Equal Employment Opportunity Requirements for State-assisted Construction Contracts.

END OF INSTRUCTIONS TO BIDDERS



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OWNER-CONTRACTOR AGREEMENT

[Where Engineer is a Third Party Hired by Owner and Engineer Has Construction Administration Duties]

Owner:

The City of Canton
218 Cleveland Avenue SW
Canton, OH 44702
Telephone: 330.489.3283

Contract: _____
Ordinance: 13/2021
Alternates: _____

Contractor:

_____, _____ 0
Telephone: _____
Fax: _____

Project: Sugarcreek Water Treatment Plant Filter Backwash Dechlorination Facility

This document is an agreement between the Owner and the Contractor for the Work described in the Contract Documents related to the Contract identified above for the Project defined above and is effective as of the date the Agreement is signed by the Owner (the "Effective Date").

The Owner and the Contractor agree as set forth in the following sections:

1. CONTRACT DOCUMENTS. The Contract Documents consist of the following documents:

- A. Legal Notice;
- B. Instructions to Bidders;
- C. Bid Form;
- D. Owner-Contractor Agreement;
- E. General Conditions of the Contract for Construction (EJCDC C-700), as modified;
- F. Supplementary Conditions (when applicable);
- G. Drawings;
- H. Specifications;
- I. Addenda issued;
- J. Contractor's Personal Property Tax Affidavit (O.R.C. 5719.042);
- K. Statement of Claim Form; and
- L. Modifications issued after the execution of the contract, including:
 - i. A Change Order;
 - ii. A Work Change Directive; or,
 - iii. A written order for a minor change of the Work issued by the Owner or Engineer in accordance with the General Conditions.
- M. When this line is checked by the Owner, e.g. with an "X" or other mark, the State of Ohio Department of Transportation, Construction and Material Specifications, effective as of January 1, 2019, will be a Contract Document, but only as modified by the document titled *ODOT Manual Supplement*, prepared by Owner.

1.1 Notwithstanding anything in the Contract Documents to the contrary, in the event of any inconsistency, the provisions of this Agreement shall control over any other Contract Document, proposal, document, or other attachment. In the event inconsistencies, conflicts, or ambiguities between or among the Contract Documents



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are discovered after execution of the Agreement, Contractor shall provide the better quality or greater quantity of Work or comply with the more stringent requirements.

Note: Non-Contract Documents. The following are the reports and tests of subsurface conditions at or contiguous to the Site, if any, that the Engineer has used in preparing the Contract Documents. These are not Contract Documents. Geotechnical data is not a warranty of subsurface conditions and is not to be relied upon as a complete representation of all possible soil conditions. It is possible that there may be other reports, and/or tests of subsurface conditions at or contiguous to the Site not prepared by or on behalf of Owner. The Owner makes no representation about such reports and/or tests, assuming they exist. Additional information, if needed by Contractor for geotechnical data or site survey, shall be obtained by the Contractor at no additional cost to Owner. The General Conditions, as modified, contain additional terms related to these reports and tests.

Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings listed below, and except for such reliance on "technical data," Contractor shall not rely upon or make any claim against Owner or Engineer with respect to: (1) the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, 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 Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information. For example, all interpolations and extrapolations of data performed by Contractor to estimate locations or quantities of subsurface strata are independent factual assumptions which Owner does not warrant. (Not applicable, if none are listed).

Note: Non-Contract Documents. The following are those reports and drawings related to any Hazardous Conditions at the Site, if any. These are not Contract Documents. The General Conditions, as modified, contain additional terms related to these reports and drawings. (None if none are listed).

2. ENGINEER RELATIONSHIP. The Contract Documents shall not be construed to create a contractual relationship of any kind between the Engineer and the Contractor or any Subcontractor or Material Supplier to the Project. The Engineer, however, shall be entitled to performance of the obligations of the Contractor intended for its benefit and to enforcement of such obligations, but nothing contained herein shall be deemed to give the Contractor or any third party any claim or right of action against the Engineer that does not otherwise exist without regard to this Contract. The Contractor and its Subcontractors shall not be deemed to be beneficiaries of any of the acts or services of the Engineer that are performed for the sole benefit of the Owner. The Contractor shall forward all communications to the Owner through the Engineer and hereby acknowledges and agrees that any instructions, reviews, advice, approvals, orders, or directives that are rendered to it by the Engineer are specifically authorized and directed by the Owner to the Contractor through the Engineer acting on behalf of the Owner.

Engineer will be performing construction administration duties as identified in the General Conditions, including, but not limited to: reviewing Applications for Payment, Change Proposals, Claims, and Shop Drawings; measuring Work quantities; and issuing Work Change Directives.

- 2.1 The Engineer is:
NA
NA
NA, NA NA



3. TIME FOR COMPLETION AND PROJECT COORDINATION.

3.1 DATE OF COMMENCEMENT. The date of commencement of the Work shall be the date identified in the Notice to Proceed issued by the Owner, or by the Owner through the Engineer, to the Contractor, or if there is no Notice to Proceed, the Effective Date of this Agreement.

3.2 DATE OF SUBSTANTIAL COMPLETION. The Project and Work for the Project consists of all labor, materials, equipment, and services necessary for construction of the Project, all in accordance with the Drawings and Specifications prepared by the Owner or Engineer. The Contractor shall achieve Substantial Completion of its Work on the Project, as defined in the General Conditions, within **189 calendar days** of the Date of Commencement (“Date of Substantial Completion”). Substantial Completion is the time at which the Work has progressed to the point where the Work is sufficiently complete, in accordance with the Contract Documents, so that the Work can be utilized for the purposes for which it is intended.

3.2.1 DATE OF FINAL COMPLETION. The Contractor shall achieve Final Completion of its Work on the Project, as defined in the General Conditions, within **30 calendar days** of the Date of Substantial Completion (“Date of Final Completion”). Final Completion shall mean that the Work is complete in accordance with the Contract Documents and the Contractor has submitted to the Owner or Engineer all documents required to be submitted to the Owner or Engineer for final payment.

3.2.2 UTILITIES AND OPERATIONS. Contractor shall not interrupt utilities to facilities or existing operations without prior written notice and approval by Owner.

3.2.3 SHUTDOWN DATES. Due to events scheduled by the Owner and/or other Owner considerations, Contractor will not be able to perform Work on the Project on the following dates (there are no shutdown dates if none are listed):

Contractor’s Construction Schedule for performing the Work shall account for Contractor not being able to perform Work on these dates and the contractual dates for Substantial Completion and Final Completion will not be changed due to Contractor not being able to perform Work on these dates.

3.3 CONSTRUCTION SCHEDULE. The Construction Schedule shall be developed by the Contractor as provided in the Contract Documents.

3.4 LIQUIDATED DAMAGES. If the Contractor does not have its Work on the Project Substantially Complete by the specified Date for Substantial Completion or Finally Complete by the Date of Final Completion, the Contractor shall pay the Owner (and the Owner may set off from sums coming due the Contractor) Liquidated Damages in the per diem amounts as set forth in the following tables, whichever may be applicable. “Contract Amount” of the Work will be determined by totaling the cost of all line items of Work.

LIQUIDATED DAMAGES – DATE FOR SUBSTANTIAL COMPLETION OF OVERALL PROJECT

<u>Original Contract Amount</u>	<u>Dollars Per Day</u>
\$1.00 to \$500,000.00	\$ 750.00
\$500,000.01 to \$2,000,000.00	\$ 1,000.00
\$2,000,000.01 to \$10,000,000.00	\$ 1,300.00
\$10,000,000.01 to \$50,000,000.00	\$ 2,000.00
\$50,000,000.01 and greater	\$ 2,500.00



LIQUIDATED DAMAGES – FINAL COMPLETION

<u>Original Contract Amount</u>	<u>Dollars Per Day</u>
\$1.00 to \$500,000.00	\$ 200.00
\$500,000.01 to \$2,000,000.00	\$ 250.00
\$2,000,000.01 to \$10,000,000.00	\$ 325.00
\$10,000,000.01 to \$50,000,000.00	\$ 500.00
\$50,000,000.01 and greater	\$ 625.00

LIQUIDATED DAMAGES FOR SUBSTANTIAL COMPLETION FOR ANY INTERIM MILESTONE SCOPE WILL BE \$1,000 PER DAY FOR EACH DAY OF UNEXCUSED DELAY BEYOND THE MILESTONE.

The Contractor acknowledges that such amounts of Liquidated Damages represent a reasonable estimate of the actual damages for loss of or interference with the intended use of the Project that the Owner would incur if the Contractor's Work is not Substantially Complete by its Date for Substantial Completion or Finally Complete by the required date for Final Completion.

4. CONTRACT SUM (also called Contract Price). The Contract Sum to be paid by the Owner to the Contractor, as provided herein, for the satisfactory performance and completion of the Work and all of the duties, obligations, and responsibilities of the Contractor under this Agreement and the other Contract Documents is **\$0.00**, subject to adjustment as set forth in the Contract Documents. The Contract Sum includes Allowances, Accepted Alternates, and all federal, state, county, municipal, and other taxes imposed by law, including but not limited to any sales, use, commercial activity, and personal property taxes payable by or levied against the Contractor on account of the Work or the materials incorporated into the Work. The Contractor will pay any such taxes. The Contract Sum includes the following:

4.1 Base Bid Amount: **\$0.00** (Lump Sum Bid); and

4.2 Accepted Alternates, included in the Contract Sum:

Alternate No.	Description	Amount
1	NA	
2	NA	

4.3 Allowances included in the Contract Sum:

Allowance Description	Amount
Allowance #1: NA	
Allowance #2: NA	

4.4 If after Substantial Completion of its Work, the Contractor fails to submit its final payment application with all the documents required to be submitted with such application within ninety (90) days after written notice to do so from the Owner and without prejudice to any other rights and remedies the Owner may have available to it, the balance of the Contract Sum shall become the Owner's sole and exclusive property, and the Contractor shall have no further interest in or right to such balance.

5. RETAINAGE. Retainage applicable to the Contract by Ohio Revised Code Sections 153.12, .13, and .14 will be withheld as defined in the Modified General Conditions. The Contractor agrees that the



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financial institution selected by the Owner for deposit of retained funds is acceptable to the Contractor and will sign any documents requested related to said account.

6. GENERAL.

6.1 MODIFICATION. No modification or waiver of any of the terms of this Agreement or of any other Contract Documents will be effective against a party unless set forth in writing and signed by or on behalf of a party. In the case of the Owner, the person executing the modification or waiver must have express authority to execute the Modification on behalf of the Owner pursuant to a resolution that is duly adopted by the Owner. Under no circumstances will forbearance, including the failure or repeated failure to insist upon compliance with the terms of the Contract Documents, constitute the waiver or modification of any such terms. The parties acknowledge that no person has authority to modify this Agreement or the other Contract Documents or to waive any of its or their terms, except as expressly provided in this section.

6.2 ASSIGNMENT. The Contractor may not assign this Agreement without the written consent of the Owner, which the Owner may withhold in its sole discretion.

6.3 LAW AND JURISDICTION. All questions regarding the validity, intention, or meaning of this Agreement or any modifications of it relating to the rights and obligation of the parties will be construed and resolved under the laws of the State of Ohio. Any suit, which may be brought to enforce any provision of this Agreement or any remedy with respect hereto, shall be brought in the Common Pleas Court of the county in which the Project is located and each party hereby expressly consents to the exclusive jurisdiction of such court to the exclusion of any other court, including any U.S. District Court or any other federal court.

6.4 CONSTRUCTION. The parties acknowledge that each party has reviewed this Agreement and the other Contract Documents and entered into this Agreement as a free and voluntary act. Accordingly, the normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party will not be employed in the interpretation of this Agreement, the other Contract Documents, or any amendments or exhibits to it or them.

6.5 APPROVALS. Except as expressly provided herein, the approvals and determinations of the Owner and Engineer will be subject to the sole discretion of the respective party and be valid and binding on the Contractor, provided only that they be made in good faith, i.e., honestly. If the Contractor challenges any such approval or determination, the Contractor has the burden of proving that it was not made in good faith by clear and convincing evidence.

6.6 PARTIAL INVALIDITY. If any term or provision of this Agreement is found to be illegal, unenforceable, or in violation of any laws, statutes, ordinances, or regulations of any public authority having jurisdiction, then, notwithstanding such term or provision, this Agreement will remain in full force and effect and such term will be deemed stricken; provided this Agreement will be interpreted, when possible, so as to reflect the intentions of the parties as indicated by any such stricken term or provision.

6.7 COMPLIANCE WITH LAWS AND REGULATIONS. The Contractor, at its expense, will comply with all applicable federal, state, and local laws, rules, and regulations applicable to the Work, including but not limited to Chapter 4115 of the Ohio Revised Code and Sections 153.59 and 153.60 of the Ohio Revised Code, which prohibit discrimination in the hiring and treatment of employees, with respect to which the Contractor agrees to comply and to require its subcontractors to comply.

6.7.1 NON-DISCRIMINATION. Contractor agrees:

- .1 That in the hiring of employees for the performance of Work under this Agreement or in any subcontract, neither the Contractor, subcontractor, or any person acting on behalf of either of them, shall by reason of race, creed, sex, disability as defined in Section 4112.01 of the Ohio Revised Code, or color discriminate against any citizen of the state in the employment of labor or workers who are qualified and available to perform the Work to which the employment relates.



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- .2 That neither the Contractor, subcontractor, nor any person acting on behalf of either of them shall, in any manner, discriminate against or intimidate any employee hired for the performance of Work under this Agreement on account of race, creed, sex, disability as defined in Section 4112.01 of the Ohio Revised Code, or color.
- .3 That there shall be deducted from the amount payable to the Contractor by the Owner under this Agreement a forfeiture of twenty-five dollars (\$25.00) as required by Ohio Revised Code Section 153.60 for each person who is discriminated against or intimidated in violation of this Agreement.
- .4 That this Agreement may be canceled or terminated by the Owner and all money to become due hereunder may be forfeited for a second or subsequent violation of the terms of this section of this Agreement.

6.7.2 PREVAILING WAGE RATES. The Contractor and its subcontractors, regardless of tier, shall strictly comply with their obligation, if any, to pay their employees working on the Project site at the applicable prevailing wage rates for the type of work, including any changes thereto, pursuant to Ohio Revised Code Chapter 4115.

6.7.3 ETHICS. By signing and entering into this agreement with the Owner, the Contractor represents that it is familiar with all applicable ethics law requirements, including without limitation Sections 102.04 and 3517.13 of the Ohio Revised Code, and certifies that it is in compliance with such requirements. The Contractor understands that failure to comply with the ethics laws is, in itself, grounds for termination of this contract and may result in the loss of other contracts with the Owner.

6.8 JOB MEETINGS. The Contractor or one of its representatives with authority to bind the Contractor will attend all job meetings. The Owner anticipates that job meetings will be scheduled on a weekly basis during construction or as needed. The Contractor will ensure that its Subcontractors also hold regular job meetings at which safety issues and job matters are discussed as these relate to the Work being performed. Job meetings include, but are not limited to, pre-construction meetings, weekly job meetings, weekly safety tool box meetings, and monthly safety meetings.

6.9 PROPERTY TAX AFFIDAVIT. The Contractor's affidavit given under Section 5719.024, Ohio Revised Code, is incorporated herein.

6.10 WARRANTIES. Notwithstanding anything to the contrary in the Contract Documents, including the Project Manual and Specifications, no warranties by Contractor shall be limited to any time shorter than the statute of limitations for written contracts in Ohio.

6.11 CONTRACTOR ATTESTATIONS.

- .1 Contractor attests that it has not scaled these contract documents to determine quantities for bids, as Contractor has field verified and taken its own dimensions to determine the quantities for its bid.
- .2 Contractor agrees that all the scales noted on the drawings are correct; so as to give it an "intent" of what is to be bid. Contractor has not relied on any other dimensions than what are noted in text and dimension lines.
- .3 Contractor has thoroughly read the Contract Documents and has asked any and all questions it has on the intent of the scope of work, or supposed errors and omissions contained in these drawings, during the bid process and prior to signing this Agreement.
- .4 Contractor will not be asserting a claim for additional time or money associated with the three issues listed above.
- .5 Contractor believes it has accurately interpreted the Contract Documents and has asked for clarification and received satisfactory response for all items not thoroughly addressed or appeared to be conflicting in the Contract Documents and has found all stipulations and requirements contained in this Agreement are as stated in the bid specifications and are



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enforceable according to Ohio Law, including but not limited to the Owner's right of offset, and the Owner's right to assess liquidated damages for work not completed according to the milestones listed on the project schedule contained in the Contract Documents.

6.12 ENTIRE AGREEMENT. This Agreement and the other Contract Documents constitute the entire agreement among the parties with respect to their subject matter and will supersede all prior and contemporaneous, oral or written, agreements, negotiations, communications, representations, and understandings with respect to such subject matter, and no person is justified in relying on such agreements, negotiations, communications, representations, or understandings.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their properly authorized representatives and agree that this Agreement is effective as of the date first set forth above.

Owner:
The City of Canton

Contractor:

By: _____

By: _____

Name: _____

Name: _____

Title: _____

Title: _____

Date: _____

Date: _____



The City of Canton

CERTIFICATE
(Section 5705.41, R.C.)

The undersigned, fiscal officer of the Owner, certifies that the moneys required to pay that part of the Contract Sum coming due during the current fiscal year, under the Agreement to which this Certificate is attached have been lawfully appropriated for such purpose and are in the appropriate account of the Owner, or in the process of collection to the credit of the appropriate account or fund, free from any previous encumbrances. Moneys due in excess of the Contract Sum shall require an additional and separate Fiscal Officer's Certificate.

DATED: _____

Fiscal Officer



The City of Canton

BID GUARANTY AND CONTRACT BOND

(O.R.C. § 153.571)

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned _____
_____ ("Contractor") as principal and _____
_____ as surety are hereby held and firmly bound unto the **City of Canton** as
obligee in the penal sum of the dollar amount of the bid submitted by the principal to the obligee on _____
_____, 20___, to undertake the construction of the **Sugarcreek Water Treatment Plant Filter
Backwash Dechlorination Facility Project** ("Project"). The penal sum referred to herein shall be the
dollar amount of the principal's bid to the obligee, incorporating any additive or deductive Alternates made
by the principal on the date referred to above to the obligee, which are accepted by the obligee. In no
case shall the penal sum exceed the amount of _____ Dollars (\$_____
_____). (If the foregoing blank is not filled in, the penal sum will be the full amount of the principal's bid,
including add Alternates. Alternatively, if the blank is filled in the amount stated must not be less than the
full amount of the bid including add Alternates, in dollars and cents. A percentage is not acceptable.) For
the payment of the penal sum well and truly to be made, we hereby jointly and severally bind ourselves,
our heirs, executors, administrators, successors, and assigns.

Signed this _____ day of _____, 20___.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH that whereas the above named principal has
submitted a bid for work on the Project.

Now, therefore, if the obligee accepts the bid of the principal and the principal fails to enter into a
proper contract in accordance with the bid, plans, details, specifications, and bills of material; and in the
event the principal pays to the obligee the difference not to exceed ten percent (10%) of the penalty
hereof between the amount specified in the bid and such larger amount for which the obligee may in good
faith contract with the next lowest bidder to perform the work covered by the bid; or in the event the
obligee does not award the contract to the next lowest bidder and resubmits the project for bidding, the
principal pays to the obligee the difference not-to-exceed ten percent (10%) of the penalty hereof
between the amount specified in the bid, or the costs, in connection with the resubmission, of printing new
contract documents, required advertising, and printing and mailing notices to prospective bidders,
whichever is less, then this obligation shall be null and void, otherwise to remain in full force and effect; if
the obligee accepts the bid of the principal and the principal within ten (10) days after the awarding of the
contract enters into a proper contract in accordance with the bid, plans, details, specifications, and bills of
material, which said contract is made a part of this bond the same as though set forth herein.

Now also, if the said principal shall well and faithfully do and perform the things agreed by said
principal to be done and performed according to the terms of said contract; and shall pay all lawful claims
of subcontractors, materialmen, and laborers, for labor performed and materials furnished in the carrying
forward, performing, or completing of said contract; we agreeing and assenting that this undertaking shall
be for the benefit of any materialman or laborer having a just claim, as well as for the obligee herein; then
this obligation shall be void; otherwise the same shall remain in full force and effect; and surety shall
indemnify the obligee against all damage suffered by failure of the principal to perform the contract
according to its provisions and in accordance with the plans, details, specifications, and bills of material
therefor and to pay all lawful claims of subcontractors, materialmen, and laborers for labor performed or
material furnished in carrying forward, performing, or completing the contract and surety further agrees
and assents that this undertaking is for the benefit of any subcontractor, materialman, or laborer having a
just claim, as well as for the obligee; it being expressly understood and agreed that the liability of the
surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as
herein stated.

The said surety hereby stipulates and agrees that no modifications, omissions, or additions in or
to the terms of the said contract or in or to the plans or specifications therefore shall in any wise affect the



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obligations of said surety on its bond, and does hereby waive notice of any such modifications, omissions or additions to the terms of the contract or to the work or to the specifications.

Signed and sealed this _____ day of _____, 20__.

PRINCIPAL

By: _____

Printed Name & Title: _____

SURETY

By: _____

Printed Name & Title: _____

Surety's Address: _____

Surety's Telephone Number: _____

Surety's Fax Number: _____

SURETY'S AGENT

Surety's Agent's Address: _____

Surety's Agent's Telephone Number: _____

Surety's Agent's Fax Number: _____



NOTE: The Contract Bond form that follows is to be used ONLY by a bidder that is awarded a contract and submits a form of bid guaranty other than the combined Bid Guaranty and Contract Bond with its bid. If a bidder submits a combined Bid Guaranty and Contract Bond, then the bid guaranty becomes the contract bond when the contract is awarded.

AIA and EJCDC Bid Bond or Payment and Performance Bond forms are not acceptable for this Project.



The City of Canton

CONTRACT BOND
(O.R.C. § 153.57)

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned ("Contractor"), as principal, and _____, as surety, are hereby held and firmly bound unto the **City of Canton** ("Owner") as obligee, in the penal sum of _____ Dollars (\$ _____), for the payment of which well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH that whereas, the above-named principal did on the _____ day of _____, 20__, enter into a contract with the Owner for construction of the **Sugarcreek Water Treatment Plant Filter Backwash Dechlorination Facility Project** ("Project"), which said contract is made a part of this bond the same as though set forth herein:

Now, if the said Contractor shall well and faithfully do and perform the things agreed by the Contractor to be done and performed according to the terms of said contract; and shall pay all lawful claims of subcontractors, materialmen, and laborers, for labor performed and materials furnished in the carrying forward, performing, or completing of said contract; we agreeing and assenting that this undertaking shall be for the benefit of any materialman or laborer having a just claim, as well as for the obligee herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

The said surety hereby stipulates and agrees that no modifications, omissions, or additions in or to the terms of the said contract or in or to the plans or specifications therefore shall in any wise affect the obligations of said surety on its bond, and does hereby waive notice of any such modifications, omissions or additions to the terms of the contract or to the work or to the specifications.

Signed and sealed this _____ day of _____, 20__.

(PRINCIPAL)

(SURETY)

By: _____

By: _____

Printed Name & Title: _____

Printed Name & Title: _____

Surety's Address: _____

Surety's Telephone Number: _____

Surety's Fax Number: _____

NAME OF SURETY'S AGENT

Surety's Agent's Address: _____

Surety's Agent's Telephone Number: _____

Surety's Agent's Fax Number: _____



BID FORM

1.01 BID SUBMITTED BY:

(Contractor)

Date bid submitted: _____

1.02 DELIVER TO:

The City of Canton
ATTN: **Purchasing/Bids**
218 Cleveland Avenue SW
Canton, OH 44702

1.03 Having carefully reviewed the Instructions to Bidders, Drawings, Specifications and other Contract Documents for the Project titled **Sugarcreek Water Treatment Plant Filter Backwash Dechlorination Facility Project** including having also received, read, and taken into account the following Addenda:

Addendum No.	Dated
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

and likewise having inspected the site and the conditions affecting and governing the Project, the undersigned hereby proposes to furnish all materials and to perform all labor, as specified and described in the said Specifications and/or as shown on the said Drawings for all Work necessary to complete the Project on a timely basis and in accordance with the Contract Documents regardless of whether expressly provided for in such Specifications and Drawings.

1.04 Before completing the Bid Form, the undersigned represents that it has carefully reviewed the Legal Notice to Bidders, Instructions to Bidders, this Bid Form, Form of Bid Guaranty and Contract Bond, Contractor's Affidavit (O.R.C. 5719.042), Owner-Contractor Agreement, General Conditions of the Contract (EJCDC C-700) (as modified for the Project), Drawings, Project Specifications, and other Contract Documents. Failure to comply with provisions of the Contract Documents may be cause for disqualification of the bid.

1.05 BONDS AND CONTRACT: If the undersigned is notified of bid acceptance, it agrees to furnish required bonds as indicated in the Instructions to Bidders.

1.06 COMPLETION OF WORK: In submitting a bid, the undersigned agrees to execute the Owner-Contractor Agreement in the form included in the Contract Documents and to complete its Work as required by the Contract Documents.

NOTE A: The wording of the Bid Form shall be used throughout, without change, alteration, or addition. Any change may cause it to be rejected.

NOTE B: Bidder is cautioned to bid only on the Brands or Standards specified.

NOTE C: If there is an inconsistency or conflict in the Bid amount, the lowest amount shall control, whether expressed in numbers or words.



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2.01 **BID:**

Include the cost of all labor and material for the contract listed below. Bidder is to fill in all blanks related to the Bid Package for which a bid is being submitted. If no bid is submitted for an item, leave the item blank or insert "NO BID" in the blank. For alternate items, indicate whether the amount stated is in addition to or a deduction from the base bid amount (if there is no indication whether the amount for an alternate is an addition or a deduction, the amount shall be a deduction).

2.02 **Bidder will complete the Work in accordance with the Contract Documents for the prices set forth in the attached Bid Schedule.**

3.01 **INSTRUCTIONS FOR SIGNING**

- A. The person signing for a sole proprietorship must be the sole proprietor or his authorized representative. The name of the sole proprietor must be shown below.
- B. The person signing for a partnership must be a partner or his authorized representative.
- C. The person signing for a corporation must be the president, vice president or other authorized representative; or he must show authority, by affidavit, to bind the corporation.
- D. The person signing for some other legal entity must show his authority, by affidavit, to bind the legal entity.

4.01 **BIDDER CERTIFICATIONS.** The Bidder hereby acknowledges that the following representations in this bid are material and not mere recitals:

1. **The Bidder acknowledges that this is a public project involving public funds, and that the Owner expects and requires that each successful Bidder adhere to the highest ethical and performance standards. The Bidder by submitting its bid pledges and agrees that (a) it will act at all times with absolute integrity and truthfulness in its dealings with the Owner and the Design Professional, (b) it will use its best efforts to cooperate with the Owner and the Design Professional and all other Contractors on the Project and at all times will act with professionalism and dignity in its dealings with the Owner, Design Professional and other Contractors, (c) it will assign only competent supervisors and workers to the Project, each of whom is fully qualified to perform the tasks that are assigned to him/her, and (d) it has read, understands and will comply with the terms of the Contract Documents.**
2. The Bidder represents that it has had a competent person carefully and diligently review each part of the Contract Documents, including any Divisions of the Specifications and parts of the Drawings that are not directly applicable to the Work on which the Bidder is submitting its bid. By submitting its bid, each Bidder represents and agrees, based upon its careful and diligent review of the Contract Documents, that it is not aware of any conflicts, inconsistencies, errors or omissions in the Contract Documents for which it has not notified the Owner in writing at least ten (10) days prior to the bid opening. If there are any such conflicts, inconsistencies, errors or omissions in the Contract Documents, the Bidder (i) will provide the labor, equipment or materials of the better quality or greater quantity of Work; and/or (ii) will comply with the more stringent requirements. The Bidder will not be entitled to any additional compensation for any conflicts, inconsistencies, errors or omissions that would have been discovered by such careful and diligent review, unless it has given such prior written notice to Owner.
3. The Bidder represents that it has had a competent person carefully and diligently inspect and examine the entire site for the Project and the surrounding area, including all parts of the site applicable to the Work for which it is submitting its bid, and carefully correlate the results of the inspection with the requirements of the Contract Documents. The Bidder agrees that its bid shall include all costs attributable to site and surrounding area conditions that would have been



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discovered by such careful and diligent inspection and examination of the site and the surrounding area, and the Bidder shall not be entitled to any Change Order, additional compensation, or additional time on account of conditions that could have been discovered by such an investigation.

4. The Bidder represents, understands and agrees that a) the Claim procedures in the General Conditions as modified for the Project are material terms of the Contract Documents, b) if it has a Claim, it will have its personnel provide complete and accurate information to complete and submit the Statement of Claim form on a timely basis, c) the proper completion and timely submission of a Statement of Claim form is a condition precedent to any change in the Contract Sum or the Contract Time(s), and d) the proper and timely submission of the Statement of Claim form provides the Owner with necessary information so that the Owner may investigate the Claim and mitigate its damages.
5. The Bidder represents that the bid contains the name of every person interested therein and is based upon the Standards specified by the Contract Documents.
6. The Bidder and each person signing on behalf of the Bidder certifies, and in the case of a bid by joint venture, each member thereof certifies as to such member's entity, under penalty of perjury, that to the best of the undersigned's knowledge and belief: (a) the Base Bid, any Unit Prices and any Alternate bid in the bid have been arrived at independently without collusion, consultation, communication or agreement, or for the purpose of restricting competition as to any matter relating to such Base Bid, Unit Prices or Alternate bid with any other Bidder; (b) unless otherwise required by law, the Base Bid, any Unit Prices and any Alternate bid in the bid have not been knowingly disclosed by the Bidder and will not knowingly be disclosed by the Bidder prior to the bid opening, directly or indirectly, to any other Bidder who would have any interest in the Base Bid, Unit Prices or Alternate bid; (c) no attempt has been made or will be made by the Bidder to induce any other Person to submit or not to submit a bid for the purpose of restricting competition; and (d) the statements made in this Bid Form are true and correct.
7. The Bidder will execute the form of Owner/Contractor Agreement in the form included with the Contract Documents, if a Contract is awarded on the basis of this bid, and if the Bidder does not execute the Contract Form for any reason, other than as authorized by law, the Bidder and the Bidder's Surety are liable to the Owner.
8. The Bidder certifies that the upon the award of a Contract, the Contractor will ensure that all of the Contractor's employees, while working on the Project site, will not purchase, transfer, use or possess illegal drugs or alcohol or abuse prescription drugs in any way.
9. The Bidder agrees to furnish any information requested by the Owner's authorized representative to evaluate that the Bidder has submitted the lowest and best bid and that the bid is responsive to the specifications.
10. The Bidder certifies that it has no unresolved findings for recovery issued by the Auditor of State.
11. The Bidder certifies that it is aware of and in compliance with the requirements of Ohio Revised Code Section 3517.13 regarding campaign contributions.

LEGAL NAME OF BIDDER: _____

BIDDER IS (check one): sole proprietor partnership corporation other legal entity



The City of Canton

NAME & TITLE OF PERSON LEGALLY AUTHORIZED TO BIND BIDDER TO A CONTRACT:

Name	Title
DATE SIGNED: _____	SIGNATURE: _____
	ADDRESS: _____

	TELEPHONE: _____
	FAX: _____
	FEDERAL TAX I.D. # _____

When the Bidder is a partnership or a joint venture, state name and address of each partner in the partnership or participant in the joint venture below:

Name	
	Address
Name	
	Address
Name	
	Address
Name	
	Address
Name	
	Address

END OF SECTION



The City of Canton

CONTRACTOR'S QUALIFICATION STATEMENT

Sugarcreek Water Treatment Plant Filter Backwash Dechlorination Facility Project

SUBMITTED TO: The City of Canton
ATTN: **Purchasing/Bids**
218 Cleveland Avenue SW
Canton, OH 44702

SUBMITTED BY: _____

NAME: _____

ADDRESS: _____

PRINCIPAL OFFICE: _____

- Corporation
- Partnership
- Individual
- Joint Venture
- Other

NAME OF PROJECT: Sugarcreek Water Treatment Plant Filter Backwash Dechlorination Facility Project

1. ORGANIZATION

- 1.1 How many years has your organization been in business as a Contractor in the construction industry?
- 1.2 How many years has your organization been in business under its present business name?
 - 1.2.1 Under what other or former names has your organization operated?
- 1.3 If your organization is a corporation, answer the following:
 - 1.3.1 Date of incorporation:
 - 1.3.2 State of incorporation:
 - 1.3.3 President's name:
 - 1.3.4 Vice President's name(s):
 - 1.3.5 Secretary's name:
 - 1.3.6 Treasurer's name:



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- 1.4 If your organization is a partnership, answer the following:
 - 1.4.1 Date of organization:
 - 1.4.2 Type of partnership (if applicable):
 - 1.4.3 Name(s) of general partner(s):
- 1.5 If your organization is individually owned, answer the following:
 - 1.5.1 Date of organization:
 - 1.5.2 Name of owner:
- 1.6 If the form of your organization is other than those listed above, describe it and name the principals:

2. LICENSING

- 2.1. List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration or license numbers, if applicable.
- 2.2. List jurisdictions in which your organization's partnership or trade name is filed.
- 2.3. List any suspension or revocations of any professional license of any director, officer, owner, or managerial employees of the Contractor, to the extent that any work to be performed on this Project is within the field of such licensed profession.

3. EXPERIENCE

- 3.1. List the categories of work that your organization normally performs with its own forces.
- 3.2. Claims and Lawsuits (If the answer to any of the questions below is yes, please attach details.)
 - 3.2.1. Has your organization ever failed to complete any work?
 - 3.2.2. Has your organization ever failed to complete any work by the substantial completion date, final completion date, or in a timely manner?
 - 3.2.3. Within the last five (5) years has your organization or any of its officers prosecuted any Claims, had any Claims prosecuted against it or them, or been involved in or is currently involved in any mediation or arbitration proceedings or lawsuits related to any construction project, or has any judgments or awards outstanding against it or them? Has your organization had any extension requests, fines and penalties imposed, or contract defaults? If the answer is yes, please attach the details for each Claim, including the names and telephone numbers of the persons who are parties, the amount of the Claim, the type of Claim and the basis for the Claim, and the outcome.

Note: As used in this document "Claim" means a Claim initiated under the Contract Documents for a project or relating to the Work for a project, including Claims made against performance bonds secured by the Contractor on other construction projects.
- 3.3. Has your organization ever failed to comply with federal, state, and local laws, rules, and regulations, including but not limited to the Occupational Safety and Health Act, the Ohio Prevailing Wage laws, and Ohio ethics laws? If the answer is yes, please attach details and reason(s) for each instance and the outcome including any fines or penalties imposed.
- 3.4. Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? If the answer is yes, please attach details for each instance, including the



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- 3.7. Provide the following information for each project your organization has had during the last five (5) years, which your organization believes is of comparable or greater size and complexity than the Owner's project. Include details regarding how such projects demonstrate your organization's ability and capacity to perform a substantial portion of the Project with its own work force. If there are more than five (5) of these projects, only provide information on the most recent five (5) projects, including current projects.

Project And Work	Contract Sum	Owner's Representative & Telephone Number	Engineer's Or Architect's Representative Name & Telephone Number	Additional Comments

- 3.7.1. State average annual amount of construction work your organization has performed during the last five years.
 - 3.7.2. If any of the following members of your organization's management -- president, chairman of the board, or any director -- operates or has operated another construction company during the last five (5) years, identify the member of management and the name of the construction company.
 - 3.7.3. If your organization is operating under a trade name registration with the Secretary of State for the State of Ohio, identify the entity for which the trade name is registered. If none, state "none."
 - 3.7.4. If your organization is a division or wholly-owned subsidiary of another entity or has another relationship with another entity, identify the entity of which it is a division or wholly-owned subsidiary or with which it has another relationship and also identify the nature of the relationship. If none, state "not applicable."
- 3.8. On a separate sheet, list the construction education, training, construction experience, and tenure with your organization for each person who will fill a management role on the Project, including without limitation the Project Executive, Project Engineer, Project Manager, and Project Superintendent. For each person listed, include with the other information the last three projects on which the person worked and the name and telephone number of the Design Professional and the Owner.
- 3.9. Describe the size and experience of your organization's work force and your equipment and facilities, in relation to your organization's ability to complete the Project successfully and on time.

4. REFERENCES

- 4.1. Trade References:
- 4.2. Bank References:
- 4.3. Surety:
 - 4.3.1. Name of bonding company:
 - 4.3.2. Name and address of agent:



5. FINANCING

5.1 Financial Statement (May be required, but only post-bid. Not a requirement to provide with bid.)

5.1.1 Attach a financial statement, preferably audited, including your organization's latest balance sheet and income statement showing the following items:

Current Assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory and prepaid expenses);

Net Fixed Assets;

Other Assets;

Current Liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries and accrued payroll taxes); and

Other Liabilities (e.g., capital, capital stock, authorized and outstanding shares par values, earned surplus and retained earnings).

5.1.2 Name and address of firm preparing attached financial statement, and date thereof.

5.1.3 Is the attached financial statement for the identical organization named on page one?

5.1.4 If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsiary).

5.2 Will the organization whose financial statement is attached act as guarantor of the contract for construction?

5.3 Attach additional documentation or explanations demonstrating your organization's financial responsibility, adequate resources and availability of credit, its means and ability to procure insurance and acceptable performance bonds required for the Project.

6. Does your organization participate in a drug-free workplace program? Provide your organization's record for both resolved and unresolved findings of the Auditor of the State of Ohio for recovery as defined in Section 9.24 of the Ohio Revised Code.

7. List any projects within the previous five years where a public entity determined that your organization was not a responsible bidder, including the name of the public entity, the reasons given by the public entity, and an explanation thereof.

8. Additional Criteria. Pursuant to the Codified Ordinance of the City of Canton, Chapter 105, the Owner, in its discretion, reserves the right to request additional information and documentation relating to the foregoing and related to any of the criteria listed in Paragraph I.6 of the Instructions to Bidders from Bidders after the bid opening. The Owner may consider such information and documentation in determining which bid is lowest and best. The Owner, in its discretion, may consider and give such weight to any and all criteria as it deems appropriate.

[left intentionally blank]



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Certification. The undersigned certifies for the reliance of the Owner that after diligent investigation, to the best of the undersigned's belief, the information provided with this Contractor's Qualification Statement is true, accurate and not misleading.

SIGNATURE:

Dated this ____ day of _____ 20__.

Name of
Organization: _____

By: _____
[print name]

Signature: _____

Title: _____

State of _____

County of _____

_____, being duly sworn, deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading.

Subscribed and sworn before me this ____ day of _____ 20__.

Notary Public

My Commission Expires: _____

SEAL



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Modified General Conditions (EJCDC)

Please go to this [link](#) for the document or enter the following link information into a web browser:

<https://cantonohio.gov/DocumentCenter/View/596/Modified-Standard-General-Conditions-of-the-Construction-Contract--3rd-Party-Engineer>



ODOT MANUAL SUPPLEMENT

This Supplement shall apply where and to the extent that the State of Ohio Department of Transportation Construction and Material Specifications, in the current version as of January 1, 2019, is expressly incorporated into the Contract Documents via the Owner-Contractor Agreement, or when designated as a Contract Document in the list of Contract Documents in the Owner-Contractor Agreement, or is referenced anywhere else in the Contract Documents as one of the Contract Documents.

1. **Regardless of any terms to the contrary in Division 100 or elsewhere, any directions or orders of the Engineer that will result in an adjustment of the Contract Price or the Contract Time shall require the prior written approval of the Owner. It is expressly understood and agreed that the Engineer does not have authority to authorize changes or modifications in the Contract Price or Contract Time.**
2. The Contractor's obligations under this ODOT Supplement are in addition to and not in limitation of its other obligations under the Contract Documents.
3. Delays. Regardless of the terms in this ODOT Supplement, including Item 109.05, all time adjustments shall be subject to a) filing a Change Proposal and / or Claim in accordance with Articles 11 and 12 of the Modified Standard General Conditions **of the Contract for Construction (EJCDC C-700, 2013 edition) ("Modified Standard General Conditions")**, b) substantiating the Contractor's entitlement to a time adjustment in accordance with the Modified Standard General Conditions and c) Item 109.05. The Contractor will be entitled to additional compensation for delays but only for those delays described in the Modified Standard General Conditions. As part of the Claims process and as a condition precedent to receiving any additional compensation, the Contractor shall prepare a cost analysis as allowed by Item 109.05.D substantiating its entitlement to additional compensation.
4. Division 100, General Provisions. The following Division 100 General Provisions of the State of Ohio Department of Transportation, Construction Specifications Manual in the current version as of January 31, 2019, are incorporated in this ODOT Supplement, subject to any changes or limitations herein.
 - a. **Item 101.01, General.**
 - b. Item 101.02, Abbreviations, provided that references to DCA, DDD, DET, DGE shall mean the Owner.
 - c. Item 101.03, Definitions, provided where terms that are defined in the other Contract Documents, the definition in the other Contract Documents shall control, and further provided that the following definitions are deleted, modified and/or added:
 - i. Claims is deleted
 - ii. Contract Bond is deleted.
 - iii. Contract Documents is deleted.
 - iv. Contract Price is deleted.
 - v. Contract Time is deleted.
 - vi. Contractor is deleted.
 - vii. Department shall mean the Owner.
 - viii. Director shall mean the Owner's representative.
 - ix. Disputes is deleted.
 - x. Engineer is deleted.



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- xi. Extra Work Contract is deleted.
- xii. Final Acceptance shall mean Final Completion as defined in the Owner Contractor Agreement.
- xiii. Final Inspector shall mean the Owner.
- xiv. Laboratory is deleted.
- xv. Prebid Question is deleted.
- xvi. Proposal Guaranty is deleted.
- xvii. Questionnaire is deleted.
- xviii. Shop Drawings is deleted.
- xix. Signatures on Contract Documents is deleted.
- xx. State or state shall mean the Owner.
- xxi. Subcontractor is deleted.
- xxii. Work is deleted.
- d. **Item 101.04, Interpretations.**
- e. Item 103.03, Cancellation of Award.
- f. Item 104.02.D.2, Significant Changes in the Character of the Work (including Tables 104.02-1 and 104.02-2 following this Item), provided that all references to Item 108 and 109.12 are deleted and that all time adjustments shall be subject to filing a Change Proposal and / or Claim in accordance with the Modified Standard General Conditions and substantiating the entitlement to an extension of time as provided in the Modified Standard General Conditions (EJCDC Document C-700, 2013 edition) ("Modified Standard General Conditions").
- g. Item 104.03, Rights in and Use of Materials Found on the Work.
- h. Item 104.04, Cleaning Up.
- i. Item 105.02, Plans and Working Drawings, provided that the review of submittals may be by the Owner or the Engineer in the Owner's discretion.
- j. Item 105.06, Superintendent.
- k. Item 105.10, Inspection of Work.
- l. Item 105.11, Removal of Defective and Unauthorized Work.
- m. Item 105.12, Load Restrictions.
- n. Item 105.13, Haul Roads, provided that the second paragraph in this Item is deleted. The Contractor shall be responsible for any damage to the roads referred to in the second paragraph.
- o. Item 105.14, Maintenance During Construction, except substitute "Final Completion" for "Final Inspector accepts the work under 109.12" and delete the remainder of the first sentence. Additionally, delete the second to last sentence in this Item.
- p. Item 105.15, Failure to Maintain Roadway or Structure.
- q. Item 105.16, Borrow and Waste Areas.
- r. Item 105.17, Construction and Demolition Debris.
- s. Item 106.01, Source of Supply and Quality Requirements.
- t. Item 106.02, Samples, Tests and Cited Specifications, provided that this Item will be optional at the discretion of the Owner. If the Owner elects to proceed under this Item, a) the Contractor



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without additional cost will provide material samples as required by the Owner, and b) the Owner may conduct such tests as it determines proper.

- u. **Item 106.03, Small Quantities and Materials for Temporary Application.**
- v. **Item 106.04, Plant Sampling and Testing Plan.**
- w. **Item 106.05, Storage of Materials.**
- x. **Item 106.06, Handling Materials.**
- y. **Item 106.07, Unacceptable Materials, except substitute the word “unacceptance” in the third sentence with the word “unacceptable.”**
- z. **Item 106.08, Department-Furnished Material.**
- aa. **Item 106.09, Steel and Iron Products Made in the United States.**
- bb. **Item 107.01, Laws to be Observed.**
- cc. **Item 107.02, Permits, Licenses, and Taxes.**
- dd. **Item 107.03, Patented Devices, Materials, and Processes.**
- ee. **Item 107.05, Federal-Aid Provisions.**
- ff. **Item 107.06, Sanitary Provisions.**
- gg. **Item 107.07, Public Convenience and Safety.**
- hh. **Item 107.08, Bridges Over Navigable Waters.**
- ii. **Item 107.09, Use of Explosives, provided that both bringing explosives onto the site and any use of explosives shall require the prior written approval of the Owner.**
- jj. **Item 107.10, Protection and Restoration of Property, provided that the Contractor shall remain responsible for all damage and injury to property until the Project is Finally Complete, and all references to Items 109.11 and 109.12 are deleted.**
- kk. **Item 107.11, Contractor’s Use of the Project Right-of-Way or Other Department-Owned Property, provided the reference to Item 109.12 is deleted.**
- ll. **Item 107.12, Responsibility for Damage Claims and Liability Insurance, provided that all notices and certificates shall be delivered to the Owner’s representative and, if there is no Owner’s representative, to the Engineer. Reference to the “State of Ohio, Department of Transportation” shall mean the Owner.**
- mm. **Item 107.13, Reporting, Investigating, and Resolving Motorist Damage Claims, provided that this item is modified to read, “When a motorist reports damage to its vehicle either verbally or in writing to the Contractor, the Contractor shall within 3 days make and file a written report to the Owner and the Engineer and also file a report with its insurance carrier”.**
- nn. **Item 107.14 Opening Sections of Project to Traffic, provided that the reference to Item 108.06 is deleted.**
- oo. **Item 107.15, Contractor’s Responsibility for Work, provided that reference to “Final Inspection according to 109.12.A” shall mean “Final Completion.” and all references to Item 108 are deleted.**
- pp. **Item 107.17, Furnishing Right-of-Way.**
- qq. **Item 107.19, Environmental Protection, provided that the Owner makes no representation as to having acquired any permits unless expressly provided in the Contract Documents. The Contractor will comply with any permits obtained by the Owner.**
- rr. **Item 107.20, Civil Rights.**



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- ss. Item **107.21, Prompt Payment.**
- tt. **with information or reports on DBE participation unless the Contract Documents otherwise require such reports or information. Additionally, unless otherwise provided in the Contract Documents, the 50% self-contracting requirement in the first sentence is waived.**
- uu. Item **108.04, Limitation of Operations.**
- vv. Item **108.05, Character of Workers, Methods, and Equipment.**
- ww. Item **108.10, Payroll Records.**
- xx. Item 109.01, Measurement of Quantities, provided that this item will apply only where payment is to be based on the measurement of quantities.
- yy. Item 109.02, Measurement Units.
- zz. Item 109.03, Scope of Payment.
- aaa. Item **108.01, Subletting of the Contract, provided that the Contractor need not provide the Owner (Reserved.)**
- bbb. Item 109.05, Extra Work as modified in this Supplement, provided that a) the references to Items 105.07, 105.10 and 108 are deleted, b) all negotiated prices shall require the Owner's written approval, c) the Owner must approve in writing any directions or orders by the Engineer to proceed with force account work, d) in Item 109.05.B.2 the reference to Department shall mean the Ohio Department of Transportation, e) the compensation provided in 109.05.B through 109.05.D constitutes payment in full for all the items referred to in Items 109.05.C.1-10, except for any additional compensation for delays, f) the mark-ups provided in Items 109.05.D.2.b and 109.05.D.2.d are deleted, and g) Item 109.05.D.2.f regarding home office overhead is deleted. The Contractor's entitlement to home office overhead, if any, shall be subject to current Ohio law.
- ccc. **109.06, Directed Acceleration.**
- ddd. **(Reserved.)**
- eee. **109.08, Unrecoverable Costs.**
5. Divisions 200 through 700. Divisions 200 through 700 of the State of Ohio Department of Transportation, Construction Specifications Manual in the current version as of January 31, 2019 are incorporated in this ODOT Supplement.
- a. All references to Division 100 Items in Divisions 200 through 700 shall be to the Division 100 Items as modified in this Supplement.
- b. Where Division 100 Items are referred to in Divisions 200 through 700 but are not included in this Supplement, the deleted references will be governed by this Paragraph 5.
- c. In Item 203.04, the reference to Item 108.06 shall be governed by Paragraph 3, Delays, in this Supplement.
- d. In Item 514.24, the reference to Item 109.10 shall be governed by the payment provisions in the Modified Standard General Conditions.
- e. In Item 624.04, the reference to item 109.09 shall be governed by the payment provisions in the Modified Standard General Conditions, i.e., the Owner will process and make payments in accordance with the provisions in the Modified Standard General Conditions. In this regard, the basis for payment of mobilization costs will be as provided in Item 624.04.
- f. General to Divisions 200 through 700. The basis for payment provided in the Basis for Payment items in these Divisions shall be the basis for payment to the Contractor when applicable.



City of Canton Codified Ordinances

Bidders shall take notice that they are to comply with the Codified Ordinances of the City of Canton, including but not limited to, the following:

1. Chapter 105.02 – Public Paving Time Restrictions.

All City public paving contracts shall include a provision for liquidated damages in order to provide the City reasonable compensation for actual damages due to a failure to ensure that asphalt paving take place on the City's road surfaces from May 1st to October 1st; and/or during optimal climatic conditions that are conducive to the best mix compacting and long term durability of the pavement, according to the highest and best practices of the asphalt paving industry.

(Ord. 270-2014. Passed 12-29-14.)

2. Chapter 105.03 – U.S. Steel Usage Required; Exception.

All City contracts shall stipulate or provide that all steel necessary in the construction of any work performed under such contracts shall be steel that is produced in the United States unless a specific product which is required is not produced by manufacturers in the United States in which event this prohibition does not apply. This section shall apply to only contracts awarded by the Board of Control of the City.

(Ord. 224-77. Passed 6-27-77.)

3. Chapter 105.05 – Materials to be Purchased Locally.

In all future contracts for the construction of buildings, structures, or other improvements under the Capital Improvement Budget, the following clause shall be printed or typewritten on each contract:

It is the desire of the City of Canton that all materials used in the construction covered by this contract shall be purchased in the Canton area except such materials which are unavailable in the Canton area.

(Res. 49-77. Passed 2-7-77.)

4. Chapter 105.06 – Minority Contract Provision.

a. All contracts with the City shall include the following clause:

The bidder agrees to expend at least \$_____ of the Contract in the event the contract is awarded to such bidder for minority/women's business enterprises. For purposes of this pledge, the term "minority/women's business enterprise" means a bona fide business established as a sole proprietorship, partnership or corporation owned, operated and controlled by one or more minority persons or women who have at least fifty-one percent (51%) ownership. "Minority" includes African Americans, Asian/Pacific Islanders, Hispanic/Latino Americans and Native American Indians. The minority or woman must have operational and managerial control, interest in capital, and earnings commensurate with the percentage of ownership. Minority/women's business enterprises may be employed as construction contractors, subcontractors, vendors or suppliers.

(Ord. 185-2011. Passed 10-31-11.)

5. Chapter 105.12 – Local Bidder Preference.

a. The Board of Control, in determining the lowest and best bidder in the award of contracts to which this section is applicable, is authorized to award contracts to local bidders as hereinafter defined, whose bid is not more than five percent (5%) higher, subject to a maximum amount of twenty thousand dollars (\$20,000.00), than the lowest dollar bid submitted by non-local bidders. The Board of Control's decision in making such an award shall be final.



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- b. For purposes of this section, "local bidder" means an individual or business entity which at the time of the award of the contract has a headquarters, division, sales office, sales outlet, manufacturing facility, or similar significant business-related location in Stark County, Ohio.
- c. All contract specifications and/or bid documents that are distributed by Canton for the purpose of soliciting bids for goods and/or services shall contain the following notice:
Prospective bidders will take notice that the City of Canton, in determining the lowest and best bidder in the award of this contract, may award a local bidder preference to any qualified bidder pursuant to Section 105.12 of the Codified Ordinances of the City of Canton. The determination of whether a bidder qualifies for the local preference shall be made by Board of Control. The Board's decision shall be final. A copy of Section 105.12 is attached.
- d. This section shall be applicable to all contracts for equipment, goods, machinery, materials, supplies, vehicles and/or services, which are purchased, leased and/or constructed at a cost in excess of fifty thousand dollars (\$50,000.00) and which require bidding pursuant to Ohio R.C. 735.05 through 735.09 and Ohio R.C. 737.03. (Ord. 115-2018. Passed 5-14-18.)

6. Chapter 105.15 – City Income Tax

- a. No person, partnership, corporation or unincorporated association may be awarded a contract with the City under Sections 105.09 or 105.10, unless the bidder is paid in full or is current and not otherwise delinquent in the payment of City income taxes, including any obligation to pay taxes withheld from employees under Section 182.05 and any payment on net profits under Section 182.06.
- b. Falsification of any information related to or any post-contractual violation of the requirement to pay City income taxes set forth in subsection (a) shall constitute cause for the rescission of the balance of the contract at the City's discretion.
- c. No partnership, corporation or unincorporated association which has as one of its partners, shareholders or owners a person who is a twenty percent (20%) or greater equity owner in such partnership, corporation or unincorporated association and who is delinquent in the payment of City income taxes as set forth in subsection (a), may be awarded a contract with the City under Sections 105.09 or 105.10.
- d. A person who is a twenty percent (20%) or greater equity owner in any partnership, corporation or unincorporated association which is delinquent in the payment of City income taxes as set forth in subsection (a) may not be awarded a contract with the City under Sections 105.09 or 105.10.
- e. A contract awarded under Sections 105.09 or 105.10 for a public improvement project, services other than personal or professional services, and personal or professional services shall not be binding or valid unless such contract contains the following provisions:

Said _____ hereby further agrees to withhold all City income taxes due or payable under Chapter 182 of the Codified Ordinances for wages, salaries, fees and commissions paid to its employees and further agrees that any of its subcontractors shall be required to agree to withhold any such City income taxes due for services performed under this contract. Furthermore, any person, firm or agency that has



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a contract or agreement with the City shall be subject to City income tax whether a resident or nonresident in the City, and whether the work being done is in the City or out of the City. In addition to the tax withheld for employees, the net profits on the contract shall be subject to City income tax.
(Ord. 238-2015. Passed 11-30-15.)

7. Chapter 182.30 – Contract Provisions

a. No contract on behalf of the City under Sections 105.09 or 105.10 of the Codified Ordinances of Canton for a public improvement project, services other than personal or professional services, and personal or professional services shall be binding or valid unless such contract contains the following provisions:

Said _____ hereby further agrees to withhold all City income taxes due or payable under Chapter 182 of the Codified Ordinances for wages, salaries, fees and commissions paid to its employees and further agrees that any of its subcontractors shall be required to agree to withhold any such City income taxes due for services performed under this contract. Furthermore, any person, firm or agency that has a contract or agreement with the City shall be subject to City income tax whether a resident or nonresident in the City, and whether the work being done is in the City or out of the City. In addition to the tax withheld for employees, the net profits on the contract shall be subject to City income tax.

b. By entering into contract with the City of Canton _____ agrees with the City regarding the manner of withholding of City income taxes as provided in Section 718.011(F) of the Ohio Revised Code.

- i. Municipal income tax withholding provisions of Sections 718.011(B)(1) and 718.011(D) ORC shall not apply to qualifying wages paid to employees for work done or services performed or rendered inside the City or on City property.
- ii. _____ agrees to withhold income tax for the City from employees' qualifying wages earned inside the City or on City property, beginning with the first day of work done or services performed or rendered inside the City.

(Ord. 238-2015. Passed 11-30-15.)

8. Chapter 507.03 – Equal Employment Opportunity Clause.

b. During the performance of this contract, the contractor agrees as follows:

1. The contractor shall not discriminate against any employee or applicant for employment because of race, age, handicap, religion, color, sex, national origin, sexual orientation or gender identity. The contractor shall take affirmative action to insure that applicants are employed and that employees are treated during employment without regard to race, religion, color, sex, national origin, military status, sexual orientation or gender identity. As used herein, the word "treated" shall mean and include without limitation the following: recruited, whether by advertising or other means; compensation, whether in the form of rates or pay or other forms of compensation; selected for training, including apprenticeship; promoted; demoted; upgraded; downgraded; transferred; laid off; and terminated. The contractor agrees to and shall post in conspicuous places available to employees and applicants for employment notices to be provided by the contracting officers setting forth the provisions of this nondiscrimination clause.
2. The contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, age, handicap, religion, color, sex, national origin, military status, sexual orientation or gender identity.

(Ord. 153-2012. Passed 9-24-12.)



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3. The contractor shall send to each labor union or representative of workers, with which he has a collective bargaining agreement or other contract or understanding, a notice advising the labor union or workers' representative of the contractor's commitments under the equal opportunity clause of the City; and he shall post copies of the notice in conspicuous places available to employees and applicants for employment.
4. The contractor shall submit in writing to the City his affirmative action plan, and each subcontractor and supplier of equipment or supplies shall submit to the general contractor his affirmative action plan. The responsibility for securing these affirmative action plans falls upon the general contractor and shall be on file at the office of the general contractor. The contractor shall furnish all information and reports required by the City or its representative pursuant to this chapter, and shall permit access to his books, records, and accounts by the contracting agency and by the Executive Secretary for purposes of investigation to ascertain compliance with the program.
5. The contractor shall take such action with respect to any subcontractor as the City may direct as a means of enforcing the provisions of this equal opportunity clause, including penalties and sanctions for noncompliance; provided, however, that in the event the contractor becomes involved in or is threatened with litigation as the result of such direction by the City, the City will enter into such litigation as is necessary to protect the interests of the City and to effectuate the City's equal opportunity program and, in the case of contracts receiving Federal assistance, the contractor or the City may request the United States to enter into such litigation to protect the interests of the United States.
6. The contractor shall file and shall cause his subcontractors, if any, to file compliance reports with the City in the form and to the extent prescribed by the City or its representative. Compliance reports filed at such times as directed shall contain information as to the employment practices, policies, programs and statistics of the contractor and his subcontractors.
7. The contractor shall include the provisions of this equal employment opportunity clause in every subcontract or purchase order, so that such provisions will be binding upon each subcontractor or vendor.
8. Refusal by the contractor or subcontractor to comply with any portion of this program as herein stated and described will subject the offending party to any or all of the following penalties:
 - A. Withholding of all future payments under the involved public contract to the contractor in violation, until it is determined that the contractor or subcontractor is in compliance with the provisions of this contract.
 - B. Refusal of all future bids for any public contract with the City or any of its departments or divisions, until such time as the contractor or subcontractor demonstrates that he has established and shall carry out the policies of the program as herein outlined.
 - C. Cancellation of the public contract and declaration of forfeiture of the performance bond.
 - D. In cases in which there is substantial or material violation or the threat of substantial or material violation of the compliance procedure or as may be provided by contract, appropriate proceedings may be brought to enforce these provisions, including the enjoining within applicable laws of groups who prevent, directly or indirectly, or seek to prevent, directly or indirectly, compliance with the policy as herein outlined.

(Ord. 179-74. Passed 6-17-74.)



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STATEMENT OF CLAIM FORM
Claim No. ____ for Contractor

1. Name of Contractor: _____
2. Date written claim given:_____.
3. Contractor's representative to contact regarding the claim:
Name:_____ Title: _____
Telephone No. _____ (office) FAX No. _____
E-mail: _____
4. General description of claim:

5. Contract Documents. If the claim is based upon any part or provision in the Contract Documents, including but not limited to pages in the Drawings and/or paragraphs in the Specifications, Owner-Contractor Agreement, General Conditions or Supplementary General Conditions, state upon which parts or provisions the claim is based:

6. Delay claims:
 - 6.1 Date delay commenced: _____
 - 6.2 Duration of the delay: _____
 - 6.3 Apparent cause of the delay and part of critical path affected:

 - 6.4 Impact of the delay and recommendations for minimizing such impact:

7. Additional compensation. Set forth in detail all additional compensation to which the Contractor believes it is entitled with respect to this claim:

8. Instructions for Completing the Statement of Claim Form ("Instructions"). The Instructions are incorporated in this Form.



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9. Truth of Claim. By submitting this claim, the Contractor and its representative certify that after conscientious and thorough review and to the best of his or her knowledge and belief a) the Contractor has complied fully with the Instructions, b) the information in this State of Claim is accurate, c) the Contractor is entitled to recover the compensation in paragraph 7, and d) the Contractor has not knowingly presented a false or fraudulent claim. The Contractor by its authorized representative must acknowledge this Statement of Claim before a notary public.

CONTRACTOR: _____

By: _____

Name and Title: _____

Date: _____

CONTRACTOR'S ACKNOWLEDGMENT

State of _____,

County of _____, ss:

_____ first being sworn, states that after conscientious and thorough review, the statements made in attached Statement of Claim Form are complete and true to the best of his or her knowledge and belief.

Sworn to before me a notary public by _____ on _____, 20__.

Notary Public

WHEN COMPLETED, FORWARD A COPY OF THIS NOTICE AND STATEMENT OF CLAIM FORM TO THE OWNER AND ENGINEER.



INSTRUCTIONS FOR COMPLETING THE STATEMENT OF CLAIM FORM

1. Completing the Statement of Claim Form ("Claim Form") is a material term of the Contract. The Claim Form tells the Owner and Design Professional that the Contractor is making a Claim and that they need to act promptly to mitigate the effects of the occurrence giving rise to the Claim. The Claim Form also provides them with information so that they can mitigate such effects. The Contractor acknowledges that constructive knowledge of the conditions giving rise to the Claim through job meetings, correspondence, site observations, etc. is inadequate notice, because knowledge of these conditions does not tell the Owner and Engineer that the Contractor will be making a Claim and most often is incomplete.
2. If the space provided in the Claim Form is insufficient, the Contractor, as necessary to provide complete and detailed information, must attach pages to the Claim Form with the required information.
3. Paragraph 4. The Contractor must state what it wants, *i.e.*, time and/or compensation, and the reason why it is entitled to time and/or compensation.
4. Paragraph 5. The Contractor must identify the exact provisions of the Contract Documents it is relying on in making its Claim. For example, if the Claim is for a change in the scope of the Contractor's Work, the Contractor must identify the specific provisions of the Specifications, and the Plan sheets and details that provide the basis for the scope change.
5. Paragraph 6. This paragraph applies to delay claims, including delays that the Contractor believes result in constructive acceleration. The Contractor must identify the cause of the delay, party or parties responsible, and what the party did or did not do that caused the delay, *i.e.*, specific work activities. The Contractor acknowledges that general statements are not sufficient, and do not provide the Owner with sufficient information to exercise the remedies available to the Owner or to mitigate the effects of the delay.

For example, if the Contractor claims a slow response time on submittals caused a delay, the Contractor must identify the specific submittals, all relevant dates, and then show on the applicable schedule, by circling or highlighting, the activities immediately affected by the delays. Also for example, if the Contractor claims it was delayed by another Contractor, the Contractor must identify the delaying Contractor, specifically what the delaying Contractor did or did not do that caused the delay, and then show the applicable schedule, by circling or highlighting, the activities immediately affected by the delays. Further by example, if the Contractor seeks an extension of time for unusually severe weather, the Contractor must submit comparative weather data along with a record of the actual weather at the job site and job site conditions.

6. Paragraph 6.4. Time is of the essence under the Contract Documents. If there is a delay, it is important to know what can be done to minimize the impact of the delay. It therefore is important that the Contractor provide specific recommendations on how to do so.
7. Paragraph 7. The Contractor must provide a specific and detailed breakdown of the additional compensation it seeks to recover. For future compensation, the Contractor shall provide its best estimate of such compensation.
8. Paragraph 8 and Acknowledgment. By submitting this Claim, the Contractor and its representative certify that after conscientious and thorough review and to the best of his or her knowledge and belief a) the Contractor has complied fully with the Instructions, b) the information in this Claim Form is accurate, c) the Contractor is entitled to recover the compensation in paragraph 7, and d) the



The City of Canton

Contractor has not knowingly presented a false or fraudulent claim. The Contractor by its authorized representative must acknowledge this Statement of Claim before a notary public.

End of Instructions



The City of Canton

CONTRACTOR'S PERSONAL PROPERTY TAX AFFIDAVIT
(O.R.C. § 5719.042)

State of Ohio
County of _____, ss:

_____, being first duly sworn, deposes and says that he is the
(Name)

_____ of _____ with offices located at
(Title) (Contractor)

_____, and as its duly
(Address of Contractor)

authorized representative, states that effective this ____ day of _____, 20__,

(Name of Contractor)

() is charged with delinquent personal property taxes on the general list of personal property as set forth below:

<u>County</u>	<u>Amount</u> (includes total amount due, plus penalties and interest thereon)
Stark	\$ _____

() is not charged with delinquent personal property taxes on the general list of personal property in Stark County.

(Affiant)

Sworn to and subscribed before me by the above-named affiant this ____ day of _____, 20__.

(Notary Public)

My commission expires
_____, 20__



The City of Canton

**CONTRACTOR’S FINAL WAIVER & RELEASE AFFIDAVIT
("AFFIDAVIT")**

Project: **Sugarcreek Water Treatment Plant Filter Backwash Dechlorination Facility**

In consideration for payment received from the City of Canton (the "City") in the amount requested in Contractor’s Final Application for Payment to the City, the receipt of which is hereby acknowledged, the undersigned Contractor hereby waives and releases any rights it has or may have to any and all types of claims relating to the Project, including without limitation claims of payment, Mechanic’s Lien, stop notice, equitable lien, labor and material bond, breach of contract or unjust enrichment, or any other claim against the City, for any labor, materials, or equipment the undersigned may have delivered or provided to the Project, except for any Claims the undersigned has made by properly and timely submitting a Statement of Claim form. The undersigned further certifies that this Affidavit covers claims by all contractors, subcontractors, and suppliers who may have provided any labor, material, or equipment to the Project through the undersigned or at the undersigned’s request. The undersigned acknowledges that all such contractors, subcontractors, sub-subcontractors and suppliers have signed an affidavit in the form of this Affidavit releasing any and all claims against the City, except for any Claims the undersigned has made by properly and timely submitting a written statement of its Claim. The undersigned hereby represents and warrants that it has paid any and all welfare, pension, vacation or other contributions required to be paid on account of the employment by the undersigned of any laborers on the Project.

This Affidavit is for the benefit of, and may be relied upon by the City. The undersigned hereby agrees to indemnify, defend and hold harmless each of the foregoing, the Project, work of improvement, and real property from any and all claims, or liens that are or should have been released in accordance with this Affidavit.

Company Name

State of: _____ County of _____

Authorized Signature (Company Officer)

Subscribed and sworn to before me this _____

day of _____

Title

Notary Public: _____

Date

My Commission Expires: _____

**PROJECT LABOR AGREEMENT
FOR THE
SUGARCREEK LAGOONS DECHLORINATION BUILDING PROJECT
ENTERED INTO BETWEEN
CITY OF CANTON
AND
EAST CENTRAL OHIO BUILDING AND CONSTRUCTION
TRADES COUNCIL AFL-CIO
AND
SIGNATORY LOCAL UNIONS**

Effective _____

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ARTICLE I

INTENT AND DURATION

Section 1. Intent And Duration. This Project Labor Agreement (the "Agreement") is entered into between the City of Canton (collectively the "Owner"); the East Central Ohio Building and Construction Trades Council, AFL-CIO ("ECOB & CTC" or "Council"); and the Signatory Unions (the "Unions"), and applies exclusively to the construction work within the scope of this Agreement to be performed on the Sugarcreek Lagoons Dechlorination Building Project (the "Project"). The purpose of this Agreement is to promote efficiency and cost-savings in the construction and refurbishment that is a part of the Project and to provide for the peaceful settlement of any and all labor disputes and grievances without strikes or lockouts, thereby promoting the public interest in assuring the timely and economical completion of the Project. This Agreement shall expire and be of no further force or effect upon the completion of the Project.

Upon execution of this Agreement by all parties, all construction, remodeling and renovation work covered by this Agreement on the Project shall be contracted exclusively to Contractors, of whatever tier, who agree to execute and be bound by the terms of this Agreement. The Unions agree that Contractors may execute the Agreement, or the Letter of Assent attached as Appendix I, for purposes of performing such work. The Owner (or its permitted designee) shall monitor compliance with this Agreement by all contractors and subcontractors. For purposes of the Agreement, the term "Contractor" shall be deemed to include all construction contractors and subcontractors of whatever tier engaged in on-site construction and renovation work on the Project. The Owner, the Unions and all signatory Contractors agree to abide by the terms and conditions contained in the Agreement. This Agreement represents the complete understanding of all parties, and no Contractor is or will be required to sign any other agreement with a signatory union as a condition of performing work coming within the scope of this Agreement. No practice, understanding or agreement between a Contractor and a Union, which conflicts with any provisions in this Agreement, will be binding on any other party unless endorsed in writing by the Owner.

Section 2. Limitation Of Agreement To Project. The Unions agree that this Agreement will be made available to, and will fully apply to, any successful bidder for

work on the Project, without regard to whether that successful bidder performs work at other sites on either a union or a non-union basis, and without regard to whether employees of such bidder are or are not members of any union. The Unions further agree that this Agreement applies only to this Project. Nothing in this agreement is intended to, or shall, interfere with, or negate, any existing contractual relationship or collective bargaining agreement between the Union and any contractor or subcontractor that may execute this Agreement.

ARTICLE II

PURPOSE

Section 1. Purpose. The Project Cost is fairly estimated to be \$116,000.00. The Project will require the construction of a Building that will house a new dechlorination system and related equipment that will treat water from the City's main water supply system at Sugarcreek Lagoons. This is a significant construction project that must be commenced in the first quarter of 2021. This Agreement is necessary to secure and preserve the integrity of the City's water distribution system. The parties to this Agreement understand and acknowledge the Project is critical to the economic development of the City of Canton and to advancing the goals appearing in the City's Comprehensive Plan.

Section 2. Time Is Of The Essence. The parties to this Agreement understand and agree that time is of the essence for this Project. The parties understand and agree that timely completion of the Project will require the use of substantial numbers of employees from construction and supporting crafts possessing skills and qualifications that are essential to the Project. The Unions pledge that they have members who are competent, skilled, and qualified to perform the required construction work. The parties also understand that on-budget completion of the Project is most critical; it is therefore essential that construction work on the Project be done in an efficient, economical manner with optimum productivity and with no delays. In recognition of those special needs of the Project, the Unions signatory hereto and their members agree not to initiate, authorize, sanction, participate in or condone, or permit their members to engage in any strike, sympathy strike, jurisdictional strike, recognitional strike, slowdown, sabotage, work to rule, sickout, sit down, picketing of any type (including informational picketing), handbilling, boycott,

interruption of work or any disruptive activity that interferes with or interrupts in any way work on the Project or other operations of the City of Canton or its Water Department. Contractors agree not to engage in any lockouts.

ARTICLE III

BENEFITS OF THE AGREEMENT

Section 1. Benefits Of The Agreement. This Agreement is intended to foster the achievement of a timely and on-budget completion of the Project by, among other things:

- (a) reducing and/or eliminating the tension and potential disagreements that might otherwise exist between Union and non-union workers on the Project;
- (b) avoiding the costly delays of strikes, sympathy strikes, jurisdictional strikes, slowdowns, walkouts, picketing, handbilling and any other disruptions or interference with work, and promoting labor harmony and peace for the duration of the Project;
- (c) standardizing terms and conditions governing the employment of labor on the Project;
- (d) permitting flexibility in work scheduling and shift hours and times;
- (e) achieving negotiated adjustments as to work rules and staffing requirements from those which otherwise might obtain;
- (f) providing comprehensive and standardized mechanisms for the settlement of work disputes;
- (g) ensuring a reliable source of skilled and experienced labor; and
- (h) furthering public policy objectives, to the extent lawful, as to improved employment opportunities for minorities, women and the economically disadvantaged in the construction industry. Mindful of the economic condition and unemployment rate in Stark County, the Owner anticipates and expects that all construction workers and employees on this Project will be residents of Stark County. In view of the very technical and specialized work that is inherent in the construction industry, all parties acknowledge that this expectation by the Owner is a goal, not a mandate. To this end, all Contractors working under this Agreement pledge that they will make a good-faith effort to reach this goal expressed by the Owner.

that this expectation by the Owner is a goal, not a mandate. To this end, all Contractors working under this Agreement pledge that they will make a good-faith effort to reach this goal expressed by the Owner.

ARTICLE IV

SCOPE OF AGREEMENT

Section 1. The Work. This Agreement is specifically defined and limited to onsite construction and renovation work required to construct the Project.

Section 2. Exclusions From Scope. Items specifically excluded from the scope of this Agreement, even if performed in connection with the Project, include the following:

- (a) Work of non-manual employees, including but not limited to, superintendents, supervisors, staff engineers, inspectors, quality control and quality assurance personnel, timekeepers, mail carriers, clerks, office workers, including messengers, guards, safety personnel, emergency medical and first aid technicians, and other professional, engineering, administrative, supervisory and management employees.
- (b) Equipment and machinery owned or controlled and operated by the Owner.
- (c) All off-site manufacture, fabrication or handling of materials, equipment or machinery (except at dedicated lay-down or storage areas and except as provided in Article IV, Section 9), and all deliveries of any type to and from the Project site (except on-site pouring of concrete).
- (d) All employees of the Owner, the Construction Supervisor, design team or any environmental, engineering or other consultant when such employees do not perform labor coming within the scope of this Agreement.
- (e) Any work performed on or near or leading to or onto the site of work on the Project and undertaken by state, county, city or other governmental bodies, or their contractors; or by public utilities or their contractors.
- (f) Off-site maintenance of leased equipment and on-site supervision of all such maintenance work.
- (g) Work by employees of a manufacturer or vendor necessary to maintain

the equipment is fully operational.

- (h) Laboratory work for specialty testing or inspections not ordinarily done by the signatory local unions.
- (i) All work done by employees of any State agency, authority or entity or employees of any municipality or other public employer.

The Unions agree that there shall be no interference with or disruption of work, of those contractors, employers, and employees exempted from coverage of this Agreement by subparagraph (a) through (i) above.

Section 3. Contract Award and Consent to Agreement.

- (a) The Owner, and/or Contractors, as appropriate, have the absolute right to award contracts or subcontracts on the Project notwithstanding the existence or nonexistence of any agreements between such Contractor and any Union party provided only that such Contractor is willing, ready and able to execute and comply with this Agreement or a Letter of Assent thereto, should such Contractor be awarded work covered by this Agreement.
- (b) All subcontractors of a Contractor, of whatever tier, who have been awarded contracts of work covered by this Agreement, on or after the effective date of this Agreement, shall also be required to accept and to be bound by the terms and conditions of this Agreement, and shall evidence their acceptance by the execution of this Agreement or a Letter of Assent thereto, prior to the commencement of work. A copy of this Agreement or Letter of Assent executed by each Contractor shall be immediately provided to the Union upon execution.

Section 4. Stand-Alone Agreement. This Agreement is a stand-alone Agreement. While this Agreement expressly does not incorporate any local area collective bargaining agreements, such local area collective bargaining agreements may be referenced for the limited purposes as hereinafter set forth in this Agreement. However, to the extent, if any, that any provisions of this Agreement conflict with any provision of a local area collective bargaining agreement, the provisions of this Agreement shall control, except for all work performed under the NTL Articles of Agreement, the National Stack/Chimney Agreement, the National Cooling Tower

Agreement, all instrument calibration work and loop checking shall be performed under the terms of the UA/IBEW Joint National Agreement for Instrument and Control Systems Technicians, and the National Agreement of the International Union of Elevator Constructors, with the exception of Articles VII, VIII and X of this Agreement, which shall apply to such work.

Section 5. Craft Jurisdiction. This Agreement shall recognize the traditional craft jurisdictions of the signatory unions. Any and all jurisdictional disputes shall be settled in accordance with Article VIII below. While this Agreement is a stand-alone Agreement, the Agreement will utilize the local area collective bargaining agreements of signatory locals, not state-wide agreements or other special project agreements, as a reference to define the signatory local unions' craft jurisdiction.

Section 6. Subcontracting. The Owner agrees that neither it nor any of its contractors or subcontractors will subcontract any work covered by this Agreement to be done on the Project except to a person, firm or corporation who is or agrees to become party to this Agreement. Any contractor or subcontractor working on the Project shall, as a condition to working on said Project, become signatory to and perform all work under the terms of this Agreement. Contractors who are signatory to local collective bargaining agreements shall be bound by the terms of their respective local collective bargaining agreements on subcontracting to the extent such terms are consistent with Article IV, Section 2 of this Agreement. Disputes concerning compliance with such local subcontracting provisions for this Project shall be subject to all of the dispute resolution provisions of this Agreement.

Section 7. Liability. It is understood that the liability of the Contractor and the liability of the separate Unions under this Agreement shall be several and not joint. The Unions agree that this Agreement does not have the effect of creating any joint employer status between or among the Owner, Construction Supervisor and/or any Contractor, and neither the Owner nor Construction Supervisor shall assume any liabilities of the Contractors.

Section 8. Abatement of Agreement. As areas of covered work on the Project are accepted by the Owner, this Agreement shall have no further force or effect on such areas except where the Contractor is directed by the Owner to engage in repairs or punch list modifications.

Section 9. Miscellaneous. Notwithstanding any other provision of this Agreement, this Agreement applies and is limited to the recognized and accepted historical definition of demolition and new construction work under the direction of and performed by the contractor(s), of whatever tier, who have contracts awarded for such work on the project. Such work shall include site preparation work and dedicated off-site work except for the contractors and subcontractors specifically excluded in this Article II. Any off-site prefabrication of any building materials, systems and/or components traditionally performed on site shall be performed by the appropriate craft signatory to this Agreement and approved by the owner.

ARTICLE V

LABOR/MANAGEMENT COOPERATION

JOINT ADMINISTRATIVE COMMITTEE

Section 1. The parties to this Agreement shall establish a Project Joint Administrative Committee ("Committee"). This Committee will be a two-person committee comprised of one member each appointed by the Owner (or its designee) and the Unions, with an alternate appointee Union member available to replace the regular appointee when a problem or grievance concerns the regular appointee's Union. Each member of the Committee shall designate an alternate who shall serve in the absence of the member for any purpose contemplated by this Agreement.

Section 2. The Committee shall meet at least quarterly, or more often if special circumstances warrant, to discuss the administration of the Agreement, the progress of the Project, labor/management problems that may arise, and any other relevant matters. Any need for interpretation which might arise from the application of the terms and conditions of the Agreement shall be referred directly to the Committee for resolution.

ARTICLE VI

UNION RECOGNITION AND EMPLOYMENT

Section 1. Pre-Hire Recognition. Each Contractor and subcontractor recognizes the Unions as the sole and exclusive bargaining representatives of all craft and trade employees within their respective jurisdictions working on the Project under the Agreement.

Section 2. Contractor's Right of Selection. Each Contractor shall have the

right to determine the competency of all employees, the number of employees required and shall have the sole responsibility for selecting employees to be laid off. To the extent any training or vendor education is required to fill any position, said training shall be undertaken at no cost or expense to Owner.

Section 3. Union Referral. For local Unions having a job referral system, each Contractor agrees to comply with such system, and the referral system shall be used exclusively by such Contractor, except as modified by this Article. Such job referral system will be operated in a non-discriminatory manner and in full compliance with Federal, state, and local laws and regulations requiring equal employment opportunities and nondiscrimination, and referrals shall not be affected in any way by the rules, regulations, bylaws, constitutional provisions or any other aspects or obligations of union membership, policies or requirements. The Union shall indemnify and hold each Contractor harmless with respect to any claim arising out of how the Union operates and administers its referral system. All hiring procedures, including related practices affecting apprenticeship and training, will be operated so as to facilitate the ability of the contractors to meet any and all equal employment opportunity/affirmative action obligations. The Contractor may reject any referral and request another, different referral; provided, however, the Contractor shall furnish, upon request from the Union, a written explanation for the rejection.

Section 4. Lack of Job Referral System. In the event that a signatory Local Union does not have a job referral system as set forth in Section 3 above, the Contractor shall give the Union a forty-eight (48) hour opportunity to refer applicants. The Contractor shall notify the Union of employees hired from any source other than referral by the Union.

Section 5. Unavailability of Union Referrals. In the event that local Unions are unable to fill any requisitions for qualified employees within forty-eight hours (48) after such requisition is made by the Contractor (Saturdays, Sundays, and Holidays excepted), the Contractor may employ applicants from any other available source. The Contractor shall inform the Union of the name, address and telephone number of any applicants hired from other sources and refer the applicant for the Local Union for dispatch to the Project.

Section 6. Union Best Efforts. The Local Unions will exert their utmost efforts

to recruit sufficient numbers of skilled craft workers to fulfill the manpower requirements of each Contractor, including calls to local unions in other geographic areas when its referral lists have been exhausted. The parties to this Agreement support the development of increased numbers of skilled construction workers from the residents of the area of the Project. Toward that end, the Unions agree to encourage the referral and utilization, to the extent permitted by law and the hiring hall procedures, of qualified residents as journeymen, apprentices and trainees on the Project.

ARTICLE VII

GRIEVANCE ARBITRATION PROCEDURE

Section 1. This Agreement is intended to provide close cooperation between management and labor. Each of the Unions will assign a representative to this Project for the purpose of completing the construction of the Project economically, efficiently, continuously, and without interruptions, delays, or work stoppages.

Section 2. The Contractors, Unions, and the employees, collectively and individually, realize the importance to all parties to maintain continuous and uninterrupted performance of the work of the Project, and agree to resolve disputes in accordance with the grievance-arbitration provisions set forth in this Article.

Section 3. Any question or dispute arising out of and during the term of this Agreement (other than trade jurisdictional disputes) shall be considered a grievance and subject to resolution under the following procedures:

Step 1. (a) When any employee subject to the provisions of this Agreement feels he or she is aggrieved by a violation of this Agreement, he or she, through his or her local union business representative or job steward, shall, within five (5) working days after the occurrence of the violation, give notice to the work-site representative of the involved Contractor stating the provision(s) alleged to have been violated. The business representative of the local union or the job steward and the work-site representative of the involved Contractor shall meet and endeavor to adjust the matter within three (3) working days after timely notice has been given. The representative of the Contractor shall keep the meeting

minutes and shall respond to the Union representative in writing at the conclusion of the meeting but not later than twenty-four (24) hours thereafter. If they fail to resolve the matter within the prescribed period, the Local Union may, within forty-eight (48) hours thereafter, pursue Step 2 of the Grievance Procedure, provided the grievance is reduced to writing, setting forth the relevant information concerning the alleged grievance, including a short description hereof, the date on which the grievance occurred, and the provisions of the Agreement alleged to have been violated.

- (a) Should the Local Union(s) or the Project Contractor or any Contractor have a dispute with the other party and if, after conferring, a settlement is not reached within three (3) working days, the dispute may be reduced to writing and proceed to Step 2 in the same manner as outlined herein for the adjustment of an employee complaint.

Step 2. The International Union Representative and the involved Contractor shall meet within seven (7) working days of the referral of a dispute to this second step to arrive at a satisfactory settlement thereof. Meeting minutes shall be kept by the Contractor. If the parties fail to reach an agreement, the dispute may be appealed by the Union, in writing, in accordance with the provisions of Step 3.

Step 3. (a) If the grievance has been submitted but not adjusted under Step 2, either party may request in writing, within seven (7) calendar days thereafter, that the grievance be submitted to an Arbitrator mutually agreed upon by them. The Contractor and the involved Union shall attempt mutually to select an arbitrator, but if they are unable to do so, they shall request the Federal Mediation and Conciliation Services (FMCS) to provide them with a list of arbitrators from which the Arbitrator shall be selected. The rules of FMCS shall govern the conduct of the arbitration hearing. The decision of

the Arbitrator shall be final and binding on all parties. The fee and expenses of such Arbitration shall be borne equally by the Contractor and the involved Local Union(s).

Section 4. Failure of the grieving party to adhere to the time limits established herein shall render the grievance null and void. Failure of the Contractor to adhere to the time limits established herein shall result in the grievance being sustained. The time limits established herein may be extended only by written consent of the parties involved at the particular step where the extension is agreed upon. The Arbitrator shall have the authority to make decisions only on issues presented to him or her, and he or she shall not have authority to change, amend, add to or detract from any of the provisions of this Agreement.

Section 5. The Owner shall be notified of all actions at Steps 2 and 3 and shall, upon their request, be permitted to participate in all proceedings at these steps.

ARTICLE VIII

JURISDICTIONAL DISPUTES

Section 1. The assignment of work will be the responsibility of the Contractor performing the work involved and such work assignments will be in accordance with decisions issued under the Plan for the Settlement of Jurisdictional Disputes in the Construction Industry (the "Plan"), or any successor Plan, adopted by the National Building and Construction Trades Department.

Section 2. All jurisdictional disputes on this Project, between or among Building and Construction Trades Unions and employers, parties to this Agreement, shall be settled and adjusted according to the present Plan established by the Building and Construction Trades Department or any other plan or method of procedure that may be adopted in the future by the Building and Construction Trades Department. Decisions rendered shall be final, binding and conclusive on the Contractors and Unions parties to this Agreement.

Section 3. All jurisdictional disputes shall be resolved without the occurrence of any strike, work stoppage, or slow-down of any nature, and the Contractor's assignment shall be adhered to until the dispute is resolved. Individuals violating this section shall be subject to immediate discharge.

Section 4. Each Contractor will conduct a pre-job conference with the appropriate

Council prior to commencing work. The Owner will be advised in advance of all such conferences and may participate if they wish.

ARTICLE IX

MANAGEMENT'S RIGHTS

Section 1. Exclusive Owner - Workforce. Except as otherwise provided in this Agreement, the Owner (or its designee) and the Contractors retain the authority to manage their operations and workforces.

Section 2. Materials, Design, Machinery, Equipment. There shall be no limitation or restriction by a signatory Union upon a Contractor's choice of materials or design, nor, regardless of source or location, upon the full use and utilization of equipment, machinery packaging, pre-cast, pre-fabricated, pre-finish, or pre-assembled materials, tools or other labor saving devices. The on-site installation or application of all items shall be performed by the craft having jurisdiction of such work; provided, however, that installation of specialty items may be performed by employees employed under this Agreement who may be directed by other personnel in a supervisory role, in circumstances requiring special knowledge of the particular items.

Section 3. New Technology, Equipment. The use of new technology, equipment, machinery, tools and/or labor saving devices and methods of performing work may be initiated by any Contractor from time to time during the Project. The Union agrees that it will not in any way restrict the implementation of such new devices or work methods.

Section 4. Disputes. If there is any disagreement between any Contractor and the Union concerning the manner or implementation of such device or method of work, the implementation shall proceed as directed by the Contractor, and the Union shall have the right to grieve and/or arbitrate the dispute as set forth in Article VII of this Agreement.

ARTICLE X

WORK STOPPAGES

Section 1. No Strikes or Work Disruptions. There shall be no strike, sympathy strike, jurisdictional strike, recognitional strike, slowdown, sabotage, work to rule, sickout, sit down, picketing of any type (including informational picketing), handbilling, boycott, interruption of work or any disruptive activity that interferes with

or interrupts in any way work on the Project. The applicable local union shall not sanction, aid or abet, encourage or continue any work stoppage, strike, picketing or other disruptive activity which violates this Article and shall undertake all reasonable means to prevent or to terminate any such activity. No employee shall engage in activity which violates this Article. Any employee who participates in or encourages any activity which violates this Article shall be subject to disciplinary action, including discharge, and if justifiably discharged for the above reasons, shall not be eligible for rehire on the same project for a period of not less than ninety (90) days. Further, if the Local Union is unable to provide qualified replacements for those employees who are in violation of this Article by the beginning of the next shift, the Employer is free to hire from any source.

Section 2. Union Responsibilities. The Local Union shall not be liable for acts of employees for which it has no responsibility. The principal officers of the Local Union will immediately instruct, order and use their best efforts to cause the members of the Local Union they represent to cease any violations of this Article. If it complies with this obligation, the Local Union shall not be responsible for unauthorized acts of employees it represents.

ARTICLE XI

WAGES AND BENEFITS

Section 1. Wages. All employees covered by this Agreement shall be classified in accordance with work performed and paid 100% of the wages and 100% of the fringe benefits as established in the respective Union's Local Area Collective Bargaining Agreement and any subsequent modifications thereto. The Contractor, upon request, shall provide the Unions and Owner with substantiation that wages and benefits are being paid on the Project. The Unions shall provide the Owner, and any Contractor or subcontractor that is party to this Agreement, with wage, fringe benefit and dues reporting forms.

Section 2. Payment of Benefits/Contributions. Each Contractor will also pay all required contributions in the amounts required by Section 1 of this Article to the established employee benefit funds that accrue to the direct benefit of the employees (such as pension and annuity, health and welfare, vacation, apprenticeship, training funds). With respect to contributions required in this Section to Employer-Union jointly

trusted funds, the Contractor adopts and agrees to be bound by the written terms of the legally established trust agreement specifying the detailed basis on which payments are to be made into, and benefits paid out of, such Trust Funds. The Contractor authorizes the parties to such Trust Funds to appoint Trustees and successor Trustees to administer the Trust Funds and hereby ratifies and accepts the Trustees so appointed as if made by Contractor.

Section 3. Non-Affiliated Labor Organizations. The Contractor shall deduct from each employee's wages all uniform dues and working assessments the employee has voluntarily authorized in writing as set forth in the Employee's Local Collective Bargaining Agreement. If a labor organization is not affiliated with the Council, and supplies its members or referrals for work on the Project, such labor organization shall pay to the Council the dues and assessments it would owe the Council if affiliated, for all periods during which the labor organization has members or referrals working on the Project. Any disputes under this paragraph shall be resolved exclusively between the labor organization and the Council by using the grievance procedure appearing in Article VII, as provided herein. All grievances shall be reduced to writing within thirty (30) days of the date on which the aggrieved party discovered the dispute. The grievance shall be initiated at Article VII, Section 3, Step 3.

ARTICLE XII
LOCAL UNION NEGOTIATIONS DURING
THE PENDENCY OF THE AGREEMENT

Section 1. All parties to this Agreement understand and acknowledge that some crafts who will be working on the Project are covered by local collective bargaining agreements that will expire prior to the projected completion of the Project. All parties understand and agree that irrespective of whether such local collective bargaining agreement negotiations are successful or unsuccessful, there shall be no strike, sympathy strike, jurisdictional strike, recognitional strike, slowdown, sabotage, work to rule, sickout, sit down, picketing of any type (including informational picketing), handbilling, boycott, interruption of work or any disruptive activity that interferes with or interrupts in any way work on the Project by any Union involved in such local negotiations, or by any of its members, nor shall there be any lockout by a Contractor on

the Project affecting such union or its members during the course of such negotiations. Irrespective of the status of any such local collective bargaining agreement negotiations, the affected Union and all of its members will observe and fully comply with the provisions of this Agreement. Should any Local Union fail or refuse to provide and/or refer qualified employees for work on the Project during an economic strike, any affected Contractor shall be permitted to utilize the procedures appearing in Article VI, Section 5 of this Agreement.

Section 2. Wage/Benefit Increases. Should a craft covered by this Agreement negotiate an increase in wages or an increase in benefits with any Contractor to become effective during the term of the Project, those wage and/or benefit increases shall be paid by the affected Contractor, as of the effective date of those increases, to those employees in that craft performing work covered by this Agreement.

ARTICLE XIII

HOURS OF WORK, OVERTIME, SHIFTS AND HOLIDAY

Section 1. Work Day and Work Week. Except as provided in Section 4, the first shift shall consist of eight (8) or ten (10) hours per day between the hours of 6:00 a.m. and 5:30 p.m., plus one-half (1/2) hour unpaid for lunch, approximately mid-way through the shift. Forty (40) hours per week shall constitute a regular week's work, whether consisting of five (5) eight (8) hour days, or four (4) ten (10) hour days. The work week will start on Monday and conclude on Sunday. A uniform starting time will be established for all crafts on each project or segment of the work. Nothing herein shall be construed as guaranteeing any employee eight (8) or ten (10) hours per day or forty (40) hours per week. The Union(s) shall be informed of the work starting time set by the contractor at the pre job conference which may be changed thereafter upon three (3) days' notice to the Union(s) and the employees. A second shift, if used, shall consist of eight hours between 3:00 p.m. and 1:00 a.m.; a third shift, if used, shall begin between 10:00 p.m. and 1:00 a.m. For purposes of Section 3, the third shift shall be considered as part of the prior day's work.

Section 2. Starting Times. Employees shall be at their place of work at the starting time and shall remain at their place of work (as designated by the Contractor) performing their assigned functions until quitting time, which is defined as the scheduled end of the shift. The parties reaffirm their policy of a fair day's work for a fair

day's wage. There shall be no pay for time not worked unless the employee is otherwise engaged at the direction of the Contractor.

Section 3. Overtime. Overtime shall be defined as all hours worked in excess of forty (40) hours in a work week or, for 8 hour shifts, in excess of eight (8) hours per day; or for 10 (ten) hour shifts for work in excess of 10 hours per day; such work and work performed on Saturdays shall be paid at one and one-half times the straight time rate of pay. However, in scheduled four (4) day/ten hour shift work weeks, Friday may be scheduled as a "makeup" day at straight time to make up for a day lost (Monday through Thursday) due to inclement weather. In addition, if a "make-up" day is scheduled, all employees directed to work on such day will be guaranteed a minimum of four (4) hours work or pay. In any week in which employees on the Project are scheduled on four/ten hour shifts, an employee whose first day of work on the Project begins on Wednesday or later day of the schedule shall be paid, during the first week of his employment only, time-and-one-half for all hours worked in excess of eight in a day or each day he works during said week. Work on Sundays and holidays shall be at double time. There shall be no restriction on any contractor's scheduling of overtime or the non-discriminatory designation of employees who will work. The contractor shall have the right to schedule work so as to minimize overtime. There shall be no pyramiding of overtime pay under any circumstances.

Section 4. Shifts.

- (a) Shift work may be performed at the option of the Contractor(s) upon three (3) days' prior notice to the Union and shall continue for a period of not less than five (5) working days. Saturdays and Sundays, if worked, may be used for establishing the five (5) day minimum work shift. If two shifts are worked, each shall consist of eight (8) hours of continuous work exclusive of a one-half (½) hour non-paid lunch period. Any third shift shall consist of seven (7) hours of continuous work exclusive of one-half (½) hour non-paid lunch period for eight (8) hours pay. A premium of \$.25 per hour shall be paid for work on the second shift and \$.50 per hour for work on the third shift.
- (b) The Contractor may establish a work week of four (4) consecutive ten (10) hour work days (exclusive of one-half (½) hour unpaid lunch, approximately midway through the shift) between Monday through Thursday.

Section 5. Minimum Pay. An employee who reports for work at the regular starting time and for whom no work is provided shall receive pay equivalent to two (2) hours at the applicable hourly rate, provided the employee at the employer's discretion remains available for work. Any employee who reports for work and for whom work is provided shall be paid for actual time worked but not less than two (2) hours. It will not be a violation of this agreement when the employer considers it necessary to shut down to avoid the possible loss of human life, because of an emergency situation that could endanger the life and safety of an employee. In such cases, employees will be compensated only for the actual time worked. In the case of a situation described above where the employer requests employees to remain available for work, the employees will be compensation for such time. If a project is shut down because of weather, employees, who report for work, shall be paid actual time worked but not less than two (2) hours. Procedures for prior notification of work cancellation shall be determined at the pre-job conference. The provisions of this section are not applicable where the employee voluntarily quits or lays off.

Section 6. Holidays. Holidays shall be New Year's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, the Day after Thanksgiving Day, and Christmas Day. A holiday falling on Saturday shall be observed on the preceding Friday. A holiday falling on Sunday shall be observed on the following Monday.

Section 7. Meal Period. The Contractor will schedule a meal period of not more than one-half hour duration at the work location at approximately the mid-point of the scheduled work shift (4 hours in a five day work week, 5 hours in a four-day work week), consistent with Section 1; provided, however, that the Contractor may, for efficiency of the operation, establish a schedule which coordinates the meal periods of two or more crafts. If an employee is required to work through his meal period, he shall be compensated for the time worked at the applicable overtime rate and the employee shall, when work permits, eat his lunch "on the fly".

Section 8. No Organized Work Breaks. There will be one (1) break during the first four (4) hours of a shift which shall be taken at the employee's work station. Individual nonalcoholic beverage containers will be permitted at the employee's work station.

Section 9. Helmets to Hardhats.

- (a) The Employers and the Unions recognize a desire to facilitate the entry into the building and construction trades of veterans who are interested in careers in*the building and construction industry. The Employers and Unions agree to utilize the services of the Center for Military Recruitment, Assessment and Veterans Employment (hereinafter "Center") and the Center's "Helmets to Hardhats" program to serve as a resource for preliminary orientation, assessment of construction aptitude, referral to apprenticeship programs or hiring halls, counseling and mentoring, support network, employment opportunities and other needs as identified by the parties.
- (b) The Unions and Employers agree to coordinate with the Center to create and maintain an integrated database of veterans interested in working on this Project and of apprenticeship and employment opportunities for this Project. To the extent permitted by law, the Unions will give credit to such veterans for bona fide, provable past experience.

ARTICLE XIV

APPRENTICES

Section 1. Need For. The parties recognize the need to maintain continuing support of programs designed to develop adequate numbers of competent workers in the construction industry. The Contractor(s) will, accordingly, employ apprentices in their respective crafts to perform work on the Project in accordance with Section 2 below.

Section 2. Ratios. The Union agrees to cooperate with the Contractor in furnishing qualified apprentices as requested and if available. Apprentices shall perform the work of their craft in accordance with the ratios and terms in their local area collective bargaining agreements. To the extent requested by Owner, the Contractor(s) may use the maximum number of apprentices permitted by local collective bargaining agreements.

ARTICLE XV

DRUG AND ALCOHOL POLICY

Section 1. Drug and Alcohol Policy. All parties understand and agree that a

drug and alcohol policy, approved by the Council, will be in force for all work performed under the Agreement. The drug and alcohol policy will prohibit the use, sale, transfer, purchase and/or possession of a controlled substance, alcohol and/or firearms while on the Project's premises and will require testing of employees. The drug and alcohol policy, attached hereto as Appendix 2, is incorporated into and made part of this Agreement and is implemented for all Contractors and employees working on the Project.

ARTICLE XVI

NON-DISCRIMINATION

Section 1. Policy. It is the continuing policy of the Owner, the Contractors and the Unions that the provisions of this Agreement shall be applied without discrimination because of age, race, sex, color, religion, creed, national origin, sexual orientation or any other basis prohibited by applicable law.

ARTICLE XVII

SOLE AND COMPLETE AGREEMENT

Section 1. The parties agree that this Agreement constitutes the sole and complete agreement between them governing the rates of pay and working conditions of the construction employees working on the Project. This Agreement settles all demands and issues on the matters subject to collective bargaining and shall not be modified or supplemented in any way except by written agreement executed by the Owner and all parties.

ARTICLE XVIII

SEPARABILITY AND SAVINGS CLAUSE

Section 1. Intent of Parties. If any article or section of this Agreement shall be held invalid by law or by a tribunal of competent jurisdiction, or if compliance with or enforcement of any article should be restrained pending a final determination as to its validity, the remainder of this Agreement shall not be affected and shall remain in full force and effect. In the event that any article or section is held invalid, the parties hereto shall, upon the request of the Unions, enter into collective bargaining negotiations for the purpose of arriving at a mutually satisfactory replacement for such article during the period of invalidity or restraint. If the Owner and the Council cannot agree on a mutually satisfactory replacement, either party shall be permitted to submit its demand to formal interest arbitration under the Rules of Federal Mediation and Conciliation


Service.

Section 2. Force of Agreement. The parties recognize the right of the Owner to withdraw, at its absolute discretion, the utilization of this Agreement as part of any bid specification should a court of competent jurisdiction issue any order which could result, temporarily or permanently, in a delay of the bidding, awarding, and/or construction work on the Project. Notwithstanding such an action by the Owner, or such court order, the parties agree that the Agreement shall remain in full force and effect on the Project, to the maximum extent legally possible. It is hereby agreed that this Agreement covers all of the signatory local unions listed below.

Section 3. Delegation. The Owner, in its sole and absolute discretion has the right to delegate its duties hereunder to a representative and/or designee who may be either an employee of Owner or a third party with whom Owner has contracted for contractor services.

OWNER
CITY OF CANTON

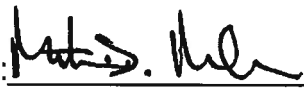
EAST CENTRAL OHIO BUILDING &
CONSTRUCTION TRADES COUNCIL,
AFL-CIO


Director of Public Service

APPROVED AS TO FORM ^{PKS}

BOILERMAKERS LOCAL NO. 744


CITY OF CANTON
DIRECTOR OF LAW

By: 
Name: MARTIN D. MAHON
Title: BUSINESS MANAGER
Date: 12-28-2020

BRICKLAYERS LOCAL 6

By: _____
Name: _____
Title: _____
Date: _____

ELECTRICIANS LOCAL NO. 540

By: _____
Name: _____
Title: _____
Date: _____

GENERAL TRUCK DRIVERS & HELPERS UNION LOCAL NO. 92

By: Warren Brustoski

Name: Warren Brustoski

Title: B.A.

Date: 1-14-21

GLAZIERS LOCAL NO. 1162

By: _____

Name: _____

Title: _____

Date: _____

HEAT & FROST INSULATORS AND ALLIED WORKERS LOCAL NO. 84

By: Damon Wrobel

Name: Damon Wrobel

Title: Business Manager

Date: 01/11/2021

**INDIANA/KENTUCKY/OHIO
REGIONAL COUNCIL OF
CARPENTERS**

By: 

Name: Kevin M. Ennis II

Title: Senior Representative

Date: 1-8-21

IRONWORKERS LOCAL NO. 550

By: 

Name: William V. Sherer

Title: Business Manager

Date: 1-8-21

LABORERS LOCAL NO. 1015


By: 

Name: Jake Croston Jr


Title: Business Manager

Date: 1/27/21

**MILLWRIGHT PILEDRIVER LOCAL
NO. 1090**

By: 
Name: Kevin M. Emms II
Title: Senior Representative
Date: 1-8-21

**OPERATIVE PLASTERERS' AND
CEMENT MASONS LOCAL NO. 109**

By: 
Name: Greg Daniels
Title: BM/FS
Date: 1-12-2021

PAINTERS LOCAL NO. 603

By: _____
Name: _____
Title: _____
Date: _____

**PLUMBERS, PIPEFITTERS AND
REFRIGERATION LOCAL NO. 94**

By: Dave Kieren
Name: DAVE KIERN DAVE KIERN
Title: BUSINESS MANAGER
Date: 1/11/2021

ROOFERS, LOCAL UNION NO. 88

By: Barbara A Dixon
Name: BARBARA A. DIXON
Title: BUSINESS MANAGER
Date: 1-8-2021

**SHEET METAL WORKERS LOCAL
NO. 33**

By: Geoff Durieux
Name: Geoff DURIEUX
Title: BUSINESS AGENT
Date: 1/11/2021

**SPRINKLER FITTERS LOCAL
NO. 669**

By: _____

Name: _____

Title: _____

Date: _____

APPENDIX 1
LETTER OF ASSENT TO THE PROJECT LABOR AGREEMENT

FOR THE SUGARCREEK LAGOONS DECHLORINATION BUILDING PROJECT

Pursuant to Article I, Section 1 of the Project Labor Agreement (the “Agreement”) for the Sugarcreek Lagoons Dechlorination Building Project (the “Project”), the undersigned party hereby agrees that it will comply with and be bound by all of the terms and conditions of the Agreement and agrees to all approved amendments or revisions thereto.

This Letter of Assent shall ONLY apply to the above-referenced Project and shall remain in effect for the duration of the above-referenced Project, after which this understanding will automatically terminate without further notice.

For the Contractor (or Subcontractor of whatever tier):

Name of Contractor/Subcontractor: _____

Name and Signature of Authorized Person:

(Print Name) _____

(Title) _____

(Signature) _____

(Phone #) _____

(Date) _____

APPENDIX 2
EMPLOYEE DRUG AND ALCOHOL TESTING POLICY
SPECIFICATIONS

The Owner is committed to providing a safe workplace for the workers assigned the Project, promoting high standards of employment health, and fostering productivity that satisfies its quality expectations. Consistent with the intent and spirit of this commitment, the Owner and ECOB & CTC have established a substance abuse testing specification for the Project with the goal of maintaining a work environment that is free from the effects of the use of illegal drugs and alcohol. The Owner will implement the terms of this policy.

This specification is not intended as a substitute for the Contractors' complete written substance abuse policy. Normally, such policies include other important features, including, but not limited to, an employee education and awareness Program, a supervisor training program and an employee assistance program.

The policy for this Project requires that any construction employee entering the project site will comply with the substance abuse testing requirements as outlined in this section. The Owner reserves the right to amend this specification upon written notice to the Contractor and the Unions on the Project. The parties to this agreement shall recognize the Drug Free Work Site Program as implemented through participating Unions and/or Contractors as administered by the contractor, or for contractors who are not signatory to agreements with signatory unions belonging to ECOB & CTC, and their core employees, an equivalent program that meets the specifications, contractual requirements, and testing requirements as set forth in this Appendix 1.

CONTRACTUAL REQUIREMENTS

All Contractors must have and enforce a written Substance Abuse Program incorporating the testing requirements, term, and conditions set forth in this specification. This specification is applicable to all employees, current and prospective, in order to be eligible to perform work at the Project. The Contractors must comply with the specification. Suppliers, vendors, and visitors are subject to confirmation of their abstinence from the possession or use of substances indicated in this specification. A copy of each contractor's substance abuse program must be

submitted to the Owner for approval prior to commencement of any work on the Project site.

The substance abuse program must apply to all employees working on the Project and subcontractors' of any of tier working on the Project site. This includes workers, new hires, replacement workers, and supervisory personnel. No employee or prospective employee of a Contractor shall be permitted to work on the Project site unless such employee has submitted to testing by this specification and unless the results of such testing are negative as hereinafter defined. The Contractor must provide the Owner with a Monthly Summary Report of the Substance Abuse Program compliance.

All Contractors must train their respective employees in methods that will allow them to recognize substance abusers. Supervisory Employees of the Owner or its subcontractor shall be trained to take action, and to confront a substance abuser in a manner consistent with generally accepted safety-training procedures.

The cost of implementing the Substance Abuse program shall be borne by each respective Contractor affected by this specification.

Suppliers, vendors, and visitors must become signatory to the terms of this specification and their abstinence from substance abuse, and their continued avoidance of violations of the specification at the project site. Furthermore, in the event of an incident and/or accident occurrences involving suppliers, vendors, and/or visitors, the same agrees to submit to the substance abuse testing when requested. Refusal to comply would be grounds to have the supplier, vendor, or visitor permanently barred from the Project site by regulators.

TESTING REQUIREMENTS

The Project requires:

- Post-offer/Pre-engagement drug and alcohol testing.
- Testing for reasonable suspicion of illegal drug use or alcohol use.
- Post accident and post incident drug and alcohol testing upon reasonable suspicion.
- Drug testing following discovery of illegal or unauthorized drugs or paraphernalia as creating reasonable suspicion.

All Prime Contractors must perform post-offer/pre-engagement, and post

accident/incident testing upon reasonable suspicion, as follows:

- a. All drug testing must be conducted by a National Institute of Drug Abuse (NIDA) certified laboratory with test results interpreted by a licensed medical review officer (MRO).
- b. The initial screen tests for alcohol shall be performed by using either a saliva test or breathalyzer test comparable to the type used by state or local law enforcement officials. Furthermore, alcohol confirmatory tests shall be performed by using either blood alcohol test or a Breathalyzer test comparable to the type used by state or local law enforcement officials.
- c. Evidence of the negative test results of individual employees required by this specification shall be furnished to the Owner prior to the commencement of work by the individual employee and promptly after performance of any subsequent testing required by this specification. Acceptable negative test result format.
 - A certificate signed by the testing laboratory, setting forth the nature and results of performed; or
 - An identification card signed by the respective Prime Contractor and issued to the individual employee, setting forth as reported on a certificate issued by the testing laboratory. The name of the testing laboratory shall also appear on the identification card; provided the affected employee authorizes the issuance of such identification card.

COMPLIANCE PROCEDURE

The Owner reserves the right to audit any substance abuse program required by this specification to verify compliance results within twenty-four (24) hours of notification of the intent to audit. The Owner shall have free right of access to all relevant records of the Prime Contractor and their subcontractors and supplies for this purpose, provided such record disclosures are within the scope of the States guidelines pertaining to confidentiality of employee records.

The Contractor's pre-engagement employees who receive a positive test result shall immediately leave the Project Site. Transportation of employees receiving the positive test result is the direct responsibility of the employing Prime Contractor, including employees of its subcontractors. Furthermore, pre-engagement employees

receiving a positive test shall not be permitted to return to the Project Site earlier than 90 days from the date of the positive test. At this time the employee may begin the process outlined by this specification again.

**DEFINITIONS/ CONFIDENTIALITY/RULES- DISCIPLINARY ACTIONS- GRIEVANCE
PROCEDURES**

1. DEFINITIONS:

- (a) Company Premises - the term "Company Premises" as used in this policy includes all property, facilities, land, building, structures, automobiles, trucks and other vehicles owned, leased or used by the Contractor on the Project. Construction job sites for which the Contractor has responsibility are included.
- (b) Prohibited Items & Substances - Prohibited substances include illegal drugs (including controlled substances, look alike drugs and designer drugs, alcoholic beverages, and drug paraphernalia in the possession of or being used by an employee on the job.
- (c) Employee - Individuals, who perform work for the Contractor, including, but not limited to management, supervision, engineering, craft workers and clerical personnel.
- (d) Accident - Any event resulting in injury to a person or property to which an employee, or contractor/contractor's employee, contributed as a direct or indirect cause.
- (e) Incident - An event which has all the attributes of an accident, except that no harm was caused to person or property.
- (f) Reasonable Cause - Reasonable cause shall be defined as tardiness, excessive absenteeism, and erratic behavior such as noticeable imbalance, incoherence, and disorientation.

2. CONFIDENTIALITY

- (a) All parties to this policy and program have only the interests of employees in mind; therefore, encourage any employee with a substance abuse problem to come forward and voluntarily accept our assistance in dealing with the illness. An employee assistance program will provide guidance and direction for you during your recovery period. If you volunteer for help, the Contractor

will make every reasonable effort to return you to work upon your recovery. The Contractor will also take action to assure that your illness is handled in a confidential manner.

- (b) All actions taken under this policy and program will be confidential and disclosed only to those with a "need to know."
- (c) When a test is required, the specimen will be identified with a code number, not by name, to insure confidentiality of the donor. Each specimen container will be properly label and made tamper proof. The donor must witness this procedure.
- (d) Unless an initial positive result is confirmed as positive, it shall be deemed negative and reported by the laboratory as such.
- (e) The handling and transportation of each specimen will be properly documented through the strict chain of custody procedures.

3. RULES - all employees must report to work in a physical condition that will enable them to perform their jobs in a safe and efficient manner. Employees shall not:

- (a) Use, possess, dispense or receive prohibited substances on or at the Project job site; or
- (b) Report to work at or on the Project with any measurable amount of prohibited substances in their system.

4. DISCIPLINE - When the Contractor has reasonable cause to believe an employee is under the influence of a prohibited substance, for reasons of safety, the employee may be suspended until test results are available. If no test results are received after three (3) working days, the employee, if available, shall return to work with back pay. If the test results prove negative, the employee shall be reinstated with back pay. In all other cases:

- (a) Applicants testing positive for drug use will not be hired.
- (b) Employees who have not voluntarily come forward, and who test positive for a drug use, will be terminated.
- (c) Employees who refuse to cooperate with testing procedures will be terminated.
- (d) Employees found in possession of drugs or drug paraphernalia will be terminated.

(e) Employees found under the influence of alcohol while on duty, or while operating a company vehicle, will be subject to termination.

5. PRESCRIPTION DRUGS - Employees using a prescribed medication which, in their physician's opinion, may impair the performance of their duties, either mental or motor functions, must immediately inform the supervisor of such prescription drug use if instructed by their physician to do so. For the safety of all employees, the Contractor will consult with you and your physician to determine if a reassignment of duties is necessary. The Contractor will attempt to accommodate your needs by making an appropriate reassignment. However, if a reassignment is not possible, you will be placed on temporary medical leave until released as fit for duty by the prescribing physician.

Appendix B

PREVAILING WAGE COORDINATOR

The City of Canton has designated Cheryl Southwell as Prevailing Wage Coordinator, in accordance with Section 4115.071 of the Ohio Revised Code.

Her office is located at City of Canton, 218 Cleveland Ave SW, Canton, Ohio 47702
Cheryl Southwell: 330-438-4183

CONTRACTORS SUBMISSIONS TO THE WAGE COORDINATOR:

- 1) Contractors are required to supply to the Wage Coordinator, **a schedule of the dates during the life of the contract with City of Canton on which they are required to pay wages to the employees.** See Section 4115.03 (A) (2)
- 2) Contractors shall also deliver to the Wage Coordinator **a certified copy of the payroll within two weeks after the initial pay date and supplemental reports for each month thereafter, which shall exhibit for each employee, their name, current address, social security number, job classification, number of hours worked for project, rate of pay, project gross pay, fringe payments, total hours all jobs, total gross all jobs, and deductions from their wages.** See Section 4115.03 (A) (3)
- 3) If the life of the contract is expected to be no more than four months from the beginning of performance by the contractor or subcontractor, such supplemental reports shall be filed each week after the initial report. See Section 4115.03 (A) (6) (C)
- 4) The certification of each payroll shall be executed by the contractor, subcontractor, or duly appointed agent thereof and **include a State of Compliance** stating that the payroll is correct and complete and that during the payroll period, all persons employed on said project have been paid the full weekly wages earned, that no rebates have or will be made either directly or indirectly to, or on behalf of said contractor or subcontractor for 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. See Section 4115.03 (A) (6) (C)
- 5) Contractors will also provide **each month a copy of any Labor Union Fringe Benefit Fund reports that they submitted to the unions.** See Section 4115.03

PREVAILING WAGE COORDINATOR MONITORING PROCEDURES

The wage Coordinator's duties are those specified in Section 4115.071 and shall include:

- 1 Attend Pre-Construction Meetings to advise contractor of Prevailing Wage responsibilities
- 2 Wage Coordinator has the authority to spot check employees pay checks in the field on the scheduled pay days for full compliance, with regard to the prevailing wage rates, including benefits.

- 3 Wage Coordinator shall visit the project site to get names of employees performing work on the project site, to cross check with payroll reports submitted.
- 4 Wage Coordinator shall verify the subcontractors performing work on the project site with regard to whether they have been approved by the contracting authority.
- 5 Wage Coordinator shall check to see that the prevailing wages are posted on the project site in a place accessible to employees.
- 6 Ascertain that the statement of compliance accompanying the certified payroll is the correct one for the project
- 7 Wage Coordinator has the right to request any addition information they feel is required for proper wage verification.
- 8 Contact Contractors of delinquent payrolls
- 9 Notify contractors when necessary to request payroll corrections
- 10 Investigate wage complaints ,by self or with Ohio Department of Commerce Division of Labor & Worker Safety

PAYROLL DATES PREVAILING WAGE LAW

Instructions to the Contractor: Please read the following and provide the required information noted on this form. This document must be submitted to the Prevailing Wage Coordinator for the public authority on or before your company begins any work under a contract for a public improvement. This requirement is also applicable to your subcontractors. Please make a copy of this document available to them. The prevailing wage laws state that contractors are responsible for their subcontractors.

.....

_____ will begin performance under contract on the
(Name of Contractor)

_____ project on _____
(Name and Location of Project) (Start Date)

and will conclude work on said project on _____
(End Date, if known)

In accordance with Section 4115.071 (C) of the Ohio Revised Code, listing of payroll dates, I hereby submit the following schedule of dates that my company is required to pay wages to its workers while on this project.

NOTE: If the life of the project is expected to be over three (3) months in length, provide only the days of the week your pay period starts and ends, plus the day you pay your workers.

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Day Pay Period Starts: _____ Day Pay Period Ends: _____

Pay Day: _____

I acknowledge that I am required by section 4115.071 (C) of the Ohio Revised Code that I must submit a copy of my company's certified payroll records for this project to the Prevailing Wage Coordinator of the public authority within two weeks of the initial pay date listed above. I further acknowledge that I am responsible to collect and submit my subcontractor's prevailing wage documents, including their certified payroll records in accordance with the law.

(Contractor's Signature and Title)

(Company Name)

(Date)

LETTER OF AUTHORIZATION FOR PAYROLL SIGNATURE:

DATE: _____

COMPANY NAME: _____

ADDRESS: _____

FEDERAL I.D.# _____

RE: _____

(Project Name)

(Project Number)

(Address)

_____ hereby authorizes

(Company Officer/Owner-Title)

_____ as the person to

complete and sign all certified payroll forms for the above project.

BY: _____

(Print Name)

(Signature)

(Title)

Sworn and subscribed in my presence this _____ day of _____ 20__

Notary Public

FRINGE BENEFITS

PLEASE COMPLETE THIS FORM AND RETURN IT TO THE ADDRESS BELOW.

_____ FRINGE BENEFITS ARE ALL PAID IN CASH TO THE EMPLOYEE.

_____ FRINGE BENEFITS ARE PAID IN CASH AND TO THE BENEFIT PROGRAMS LISTED BELOW.

_____ FRINGE BENEFITS ARE ALL PAID TO THE FOLLOWING BENEFIT PROGRAMS:

HEALTH & WELFARE PLAN: _____

ADDRESS: _____

PENSION PLAN: _____

ADDRESS: _____

APPRENTICESHIP PROGRAM: _____

YOUR COMPANY IS: _____ UNION _____ NON-UNION

YOUR COMPANY PAYS ALL EMPLOYEES: _____ WEEKLY _____ BI-WEEKLY

FORWARD A BLANK FORM TO EACH SUBCONTRACTOR ON THE PROJECT FOR COMPLETION.
RETURN ALL FORMS TO:

CITY OF CANTON
218 CLEVELAND AVE SW
CANTON, OHIO 44702
ATTN: PREVAILING WAGE COORDINATOR

CONTRACTOR'S NAME: _____

ADDRESS: _____

PROJECT NAME: _____

PREVAILING WAGE NOTIFICATION to EMPLOYEE

4115.05the contractor or subcontractor shall furnish each employee not covered by a collective bargaining agreement written notification of the job classification to which the employee is assigned, the prevailing wage determined to be applicable to that classification, separated into the hourly rate of pay and the fringe payments, and the identity of the prevailing wage coordinator appointed by the public authority. The contractor or subcontractor shall furnish the same notification to each affected employee every time the job classification of the employee is changed.

Project Name:	Job Number.
Contractor:	
Project Location:	
Jobsite posting of prevailing wage rates located:	

Prevailing Wage Coordinator	Employee
Name: City of Canton Attn: Cheryl Southwell	Name:
Street: 218 Cleveland Ave SW 6th Floor	Street:
City: Canton	City:
State/Zip: Ohio 44702	State/Zip:
Phone: 330-438-4183	Phone:

You will be performing work on this project that falls under these classifications. You will be paid the appropriate rate for the type of work you are performing.

Classification:	Prevailing Wage Rate Total Package:	Minus your fringe benefits:	Your hourly base rate:

Hourly fringe benefits paid on your behalf by this company:

Fringe	Amount	Fringe	Amount
Health Insurance		Vacation	
Life Insurance		Holiday	
Pension		Sick Pay	
Bonus		Training	
Other		Total Hourly Fringes	

Contractor's Signature:	Date:
Employee's Signature:	Date:

INSTRUCTIONS FOR PREPARING CERTIFIED PAYROLL REPORTS

General:

Contractors and subcontractors are required by law to submit certified payroll reports for work on projects covered by Ohio's Prevailing Wage Law. This form meets the reporting requirements established by Ohio Revised Code Chapter 4115. The use of this form is not mandatory; employers may submit their own forms provided that all of the required information is included. This form may be reproduced, or additional copies obtained from:

Ohio Department of Commerce
Division of Industrial Compliance
Bureau of Wage and Hour Administration
6606 Tusling Road, P.O. Box 4009
Reynoldsburg, Ohio 43068-9009
614-644-2239
www.com.ohio.gov

Certified Payroll Heading:

Employer name and address: Company's full name and address... Indicate if the company is a subcontractor.

Subcontractor: Check and list the name of the General Contractor or Prime.

Project: Name and location of the project, including county.

Contracting Public Authority: Name and address of the contracting public authority... (Owner of the project).

Week Ending: Month, day, and year for last day of reporting period.

Payroll #: Indicates first, second, third, etc. payroll filed by the company for the project.

Page indicator: number of pages included in the report.

Project Number: Determined by the public authority... If there is no number leave blank.

Payroll Information by column:

1. **Employee Name, Address and Social Security number:** This information must be provided for all employees that perform physical labor on the project. The Social Security number is required; the last four digits may be permitted by the public authority. Corporate officers, partners, and salaried employees are considered employees and must be paid the prevailing rate. Individual sole proprietors do not have to pay themselves prevailing rate but must report their hours on the project.
2. **Work Class:** List classification of work actually performed by employee. If unsure of work classification, consult the Ohio Department of Commerce-Division of Industrial Compliance & Labor-Bureau of Wage and Hour Administration. Employees working more than one classification should have separate line entries for each classification. Indicate what year/level for Apprentices. Be specific when using laborer and operator classifications; for example, Backhoe Operator or Asphalt Laborer or by "Group".
3. **Hours Worked, Day & Date:** In the first row of column 3, enter days of the company's pay period for example; M T W TH F S S. The second row is for the date that corresponds with each day for the pay period. In the employee information section, enter the number of hours worked on the prevailing wage project and which day the hours were worked. Separate rows are labeled for (ST) straight time hours and (OT) overtime hours. All hours worked after 40, must be paid at the appropriate overtime rate.
4. **Project Total Hours:** Total the hours entered for pay period.
5. **Base Rate:** Enter actual rate per hour paid to the employee. The overtime hourly rate is time and one-half the base rate listed in the prevailing wage schedule plus fringe benefits at straight time rate. The prevailing wage schedule lists the base rate plus fringe benefit amounts. These amounts added together equal the total prevailing wage rate. Employers must pay this total amount in one of three ways.
 - 1) Total rate may be paid in entirety in the base rate to the employee; in which case, the cash designation will be checked for fringe benefits.
 - 2) Total rate may be paid as listed in prevailing wage rate schedule with total fringe amounts paid approved plans.
 - 3) Total rate may be paid with a combination of base rate and fringe payments to approved plans in amounts other than those listed in schedule.
6. **Project Gross:** Enter total gross wages earned on the project for straight time and overtime. Project hours "X" base rate should equal project gross.
7. **Fringes:** If fringe benefits are paid in the hourly base rate, indicate this by marking the Cash space. If fringe benefits are paid to approved plans as listed in the prevailing wage rate schedule, mark the space Approved Plans. If fringe benefits are paid partially in the base rate and partially to approved plans, mark the space Cash & Approved Plans. List the hourly amount paid to approved plans for each fringe. If payments are not made on a per hour basis, calculate the hourly fringe credit by dividing the yearly employer contribution by the lesser of: hours actually worked in the year (these must be documented) or 2080. Fringe benefits include: Employer's share of health insurance, life insurance, retirement plan, bonus/profit sharing, sick pay, holiday pay, personal leave, vacation, and education/training programs. If unsure of a possible fringe benefit, contact the Ohio Department of Commerce-Division of Industrial Compliance & Labor-Bureau of Wage and Hour Administration.
8. **Total Hours All Jobs:** Total all hours worked during the pay period including non-prevailing wage jobs.
9. **Total Gross All Jobs:** Gross amount earned in the pay period for all hours worked.
10. Self explanatory.
11. Self explanatory.

- (a) The number of hours worked in each day and the total number of hours worked each week.
 4. Hourly rate for each employee.
 - (a) The minimum rate paid must be the wage rate for the appropriate classification. The Department's Wage Rate Schedule sets this rate.
 - (b) All overtime worked is to be paid at time and one-half for all hours worked more than forty (40) per week.
 5. Where fringes are paid into a bona fide plan instead of cash, list each benefit and amount per hour paid to program for each employee.
 - (a) When the amount contributed to the fringe benefit plan and the total number of hours worked by the employee on all projects for the year are documented, the hourly amount is calculated by dividing the total contribution of the employer by the total number of hours worked by the employee.
 - (b) When the amount contributed to the fringe benefit is documented but not the total hours worked, the hourly amount is calculated by **dividing the total yearly contribution by 2080.**
 6. Gross amount earned on all projects during the pay period.
 7. Total deductions from employee's wages.
 8. Net amount paid.
- J. The reports shall be certified by the contractor, subcontractor, or duly appointed agent stating that the payroll is correct and complete; and that the wage rates shown are not less than those required by the O.R.C. 4115.
- K. Provide a Final Affidavit to the Prevailing Wage Coordinator upon the completion of the project.

AFFIDAVIT OF CONTRACTOR OR SUBCONTRACTOR

PREVAILING WAGES

I, _____,
(Name of person signing the affidavit) (Title)

of the _____,
(Company Name), do hereby certify that the

wages paid to all employees for the full number of hours worked in connection with the Contract to the
Improvement, Repair and Construction of:

(Project name and location of the project)

during the following period from _____ to _____

in accordance with the prevailing wage prescribed by the contract document.

I further certify that no rebates or deductions for any wages due any person have been directly
or indirectly made other than those provided by law.

(Signature of officer or agent)

Sworn to and subscribed in my presence this _____ day of _____

20____.

(Notary Public)

The above affidavit must be executed and sworn to by the officer or agent of the Contractor or
Subcontractor who supervises the payment of employees, before the owner will release the surety and/or
make a final payment due under the terms of the Contract.

Appendix B

Prevailing Wage Determination Cover Letter

County: STARK
Determination Date: 02/19/2021
Expiration Date: 05/19/2021

THE FOLLOWING PAGES ARE PREVAILING RATES OF WAGES ON PUBLIC IMPROVEMENTS FAIRLY ESTIMATED TO BE MORE THAN THE AMOUNT IN O.R.C. SEC. 4115.03 (b) (1) or (2), AS APPLICABLE.

Section 4115.05 provides, in part: "Where contracts are not awarded or construction undertaken within ninety days from the date of the establishment of the prevailing wages, there shall be a redetermination of the prevailing rate of wages before the contract is awarded." The expiration date of this wage schedule is listed above for your convenience only. This wage determination is not intended as a blanket determination to be used for all projects during this period without prior approval of this Department.

Section 4115.04, Ohio Revised Code provides, in part: "Such schedule of wages shall be attached to and made a part of the specifications for the work, and shall be printed on the bidding blanks where the work is done by contract..."

The contract between the letting authority and the successful bidder shall contain a statement requiring that mechanics and laborers be paid a prevailing rate of wage as required in Section 4115.06, Ohio Revised Code.

The contractor or subcontractor is required to file with the contracting public authority upon completion of the project and prior to final payment therefore an affidavit stating that he has fully complied with Chapter 4115 of the Ohio Revised Code.

The wage rates contained in this schedule are the "Prevailing Wages" as defined by Section 4115.03, Ohio Revised Code (the basic hourly rates plus certain fringe benefits). These rates and fringes shall be a minimum to be paid under a contract regulated by Chapter 4115 of the Ohio Revised Code by contractors and subcontractors. The prevailing wage rates contained in this schedule include the effective dates and wage rates currently on file. In cases where future effective dates are not included in this schedule, modifications to the wage schedule will be furnished to the Prevailing Wage Coordinator appointed by the public authority as soon as prevailing wage rates increases are received by this office.

"There shall be posted in a prominent and accessible place on the site of work a legible statement of the Schedule of Wage Rates specified in the contract to the various classifications of laborers, workmen, and mechanics employed, said statement to remain posted during the life of such contract." Section 4115.07, Ohio Revised Code.

Apprentices will be permitted to work only under a bona fide apprenticeship program if such program exists and if such program is registered with the Ohio Apprenticeship Council.

Section 4115.071 provides that no later than ten days before the first payment of wages is due to any employee of any contractor or subcontractor working on a contract regulated by Chapter 4115, Ohio Revised Code, the contracting public authority shall appoint one of his own employees to act as the prevailing wage coordinator for said contract. The duties of the prevailing wage coordinator are outlined in Section 4115.071 of the Ohio Revised Code.

Section 4115.05 provides for an escalator in the prevailing wage rate. Each time a new rate is established, that rate is required to be paid on all ongoing public improvement projects.

A further requirement of Section 4115.05 of the Ohio Revised Code is: "On the occasion of the first pay date under a contract, the contractor shall furnish each employee not covered by a collective bargaining agreement or understanding between employers and bona fide organizations of Labor with individual written notification of the job classification to which the employee is assigned, the prevailing wage determined to be applicable to that classification, separated into the hourly rate of pay and the fringe payments, and the identity of the prevailing wage Coordinator appointed by the public authority. The contractor or subcontractor shall furnish the same notification to each affected employee every time the job classification of the employee is changed."

Work performed in connection with the installation of modular furniture may be subject to prevailing wage.

**THIS PACKET IS NOT TO BE SEPARATED BUT IS TO REMAIN COMPLETE AS IT IS SUBMITTED TO YOU.
(Reference guidelines and forms are included in this packet to be helpful in the compliance of the Prevailing**

Wage law.)
wh1500

of Ashtabula, Austinburg, Geneva, Harperfield, Jefferson, Plymouth & Saybrook) (townships of Andover, Cherry Valley, Colbrook, Canneaut, Denmark, Dorset, East Orwell, Hartsgrove, Kingville, Lenox, Monroe, Morgan, New Lyme, North Kingsville, Orwell, Pierpoint, Richmond Rock Creek, Rome, Sheffield, Trumbull, Wayne, Williamsfield & Windsor) Erie County: (post offices & townships of Berlin, Berlin Heights, Birmingham, Florence, Huron, Milan, Shinrock & Vermilion)

Details :

Asbestos & lead paint abatement including, but not limited to the removal or encapsulation of asbestos & lead paint, all work in conjunction with the preparation of the removal of same & all work in conjunction with the clean up after said removal. The removal of all insulation materials, whether they contain asbestos or not, from mechanical systems (pipes, boilers, ducts, flues, breaching, etc.) is recognized as being the exclusive work of the Asbestos Abatement Workers.

On all mechanical systems (pipes, boilers, ducts, flues, breaching, etc.) that are going to be demolished, the removal of all insulating materials whether they contain asbestos or not shall be the exclusive work of the Laborers.

An Abatement Journeyman is anyone who has more than 300 hours in the Asbestos Abatement field.

Prevailing Wage Rate Skilled Crafts

Name of Union: Boilermaker Local 744

Change # : LCNO1-2019fbLoc744

Craft : Boilermaker Effective Date : 04/03/2019 Last Posted : 04/03/2019

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Boilermaker	\$38.05		\$7.07	\$16.07	\$0.74	\$0.00	\$5.08	\$0.75	\$0.00	\$0.00	\$67.76	\$86.78
Apprentice	Percent											
1st 6 months	70.02	\$26.64	\$7.07	\$16.07	\$0.74	\$0.00	\$5.08	\$0.75	\$0.00	\$0.00	\$56.35	\$69.67
2nd 6 months	72.52	\$27.59	\$7.07	\$16.07	\$0.74	\$0.00	\$5.08	\$0.75	\$0.00	\$0.00	\$57.30	\$71.10
3rd 6 months	75.00	\$28.54	\$7.07	\$16.07	\$0.74	\$0.00	\$5.08	\$0.75	\$0.00	\$0.00	\$58.25	\$72.52
4th 6 months	77.51	\$29.49	\$7.07	\$16.07	\$0.74	\$0.00	\$5.08	\$0.75	\$0.00	\$0.00	\$59.20	\$73.95
5th 6 months	80.00	\$30.44	\$7.07	\$16.07	\$0.74	\$0.00	\$5.08	\$0.75	\$0.00	\$0.00	\$60.15	\$75.37
6th 6 months	85.03	\$32.35	\$7.07	\$16.07	\$0.74	\$0.00	\$5.08	\$0.75	\$0.00	\$0.00	\$62.06	\$78.24
7th 6 months	90.00	\$34.25	\$7.07	\$16.07	\$0.74	\$0.00	\$5.08	\$0.75	\$0.00	\$0.00	\$63.96	\$81.08
8th 6 months	95.00	\$36.15	\$7.07	\$16.07	\$0.74	\$0.00	\$5.08	\$0.75	\$0.00	\$0.00	\$65.86	\$83.93
Helper	60.00	\$22.83	\$7.07	\$16.07	\$0.74	\$0.00	\$5.08	\$0.75	\$0.00	\$0.00	\$52.54	\$63.96

Special Calculation Note : Other is Supplemental Health

Ratio :

5 Journeymen to 1 Apprentice to 1 Helper

Jurisdiction (* denotes special jurisdictional note) :

ASHTABULA, CARROLL, COSHOCTON, CUYAHOGA, GEAUGA, HARRISON, HOLMES, LAKE, LORAIN, MAHONING, MEDINA, PORTAGE, STARK, SUMMIT, TRUMBULL, TUSCARAWAS, WAYNE

Special Jurisdictional Note :

Details :

Prevailing Wage Rate Skilled Crafts

Name of Union: Bricklayer Local 6

Change # : LCN01-2020fbLoc6

Craft : Bricklayer Effective Date : 05/01/2020 Last Posted : 04/23/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Bricklayer	\$29.16		\$9.92	\$7.24	\$1.18	\$0.00	\$0.00	\$0.05	\$0.00	\$0.00	\$47.55	\$62.13
Pointer Caulker Cleaner	\$29.16		\$9.92	\$7.24	\$1.18	\$0.00	\$0.00	\$0.05	\$0.00	\$0.00	\$47.55	\$62.13
Stone Mason	\$29.16		\$9.92	\$7.24	\$1.18	\$0.00	\$0.00	\$0.05	\$0.00	\$0.00	\$47.55	\$62.13
Cement Mason	\$29.16		\$9.92	\$7.24	\$1.18	\$0.00	\$0.00	\$0.05	\$0.00	\$0.00	\$47.55	\$62.13
Plaster	\$29.16		\$9.92	\$7.24	\$1.18	\$0.00	\$0.00	\$0.05	\$0.00	\$0.00	\$47.55	\$62.13
Apprentice	Percent											
1st 6 months	55.00	\$16.04	\$9.92	\$7.24	\$1.18	\$0.00	\$0.00	\$0.05	\$0.00	\$0.00	\$34.43	\$42.45
2nd 6 months	60.00	\$17.50	\$9.92	\$7.24	\$1.18	\$0.00	\$0.00	\$0.05	\$0.00	\$0.00	\$35.89	\$44.63
3rd 6 months	65.00	\$18.95	\$9.92	\$7.24	\$1.18	\$0.00	\$0.00	\$0.05	\$0.00	\$0.00	\$37.34	\$46.82
4th 6 months	70.00	\$20.41	\$9.92	\$7.24	\$1.18	\$0.00	\$0.00	\$0.05	\$0.00	\$0.00	\$38.80	\$49.01
5th 6 months	75.00	\$21.87	\$9.92	\$7.24	\$1.18	\$0.00	\$0.00	\$0.05	\$0.00	\$0.00	\$40.26	\$51.20
6th 6 months	80.00	\$23.33	\$9.92	\$7.24	\$1.18	\$0.00	\$0.00	\$0.05	\$0.00	\$0.00	\$41.72	\$53.38
7th 6 months	90.00	\$26.24	\$9.92	\$7.24	\$1.18	\$0.00	\$0.00	\$0.05	\$0.00	\$0.00	\$44.63	\$57.76
8th 6 months	95.00	\$27.70	\$9.92	\$7.24	\$1.18	\$0.00	\$0.00	\$0.05	\$0.00	\$0.00	\$46.09	\$59.94

Special Calculation Note : OTHER IS DRUG TESTING

Ratio :

- 1 Journeymen to 1 Apprentice
- 5 Journeymen to 2 Apprentice
- 9 Journeymen to 3 Apprentice
- 13 Journeymen to 4 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

CARROLL, STARK, TUSCARAWAS

Special Jurisdictional Note :

Details :

7th 6 months	94.88	\$21.98	\$5.00	\$7.85	\$0.20	\$0.00	\$0.37	\$0.37	\$0.00	\$0.00	\$35.77	\$46.77
8th 6 months	94.88	\$21.98	\$5.00	\$7.85	\$0.20	\$0.00	\$0.37	\$0.37	\$0.00	\$0.00	\$35.77	\$46.77

Special Calculation Note : Other \$.40 is for International Masonry Training. Classification title contains "Bricklayer" because contract originates within the Bricklayer Local. Note that the classification description is clarified after the local union number at the top of the page.

Ratio :

Journeyman 4 to 1 Apprentice

Journeyman 6 to 1 Apprentice thereafter

Jurisdiction (* denotes special jurisdictional note) :

ASHTABULA, CARROLL, COLUMBIANA, COSHOCTON, HARRISON, HOLMES, JEFFERSON, MAHONING, PORTAGE, STARK, TRUMBULL, TUSCARAWAS, WAYNE

Special Jurisdictional Note : Townships in Columbiana County are as follows: Salem, Perry, Fairfield, Center Elkrun, Middletown and Unity

Details :

Mechanic's assistants shall do all the handling, of sand, cement, lime, tile, marble, terrazzo and other materials used by the mechanics upon being delivered to the building or at the job. Hand rubbing, rolling, mixing, formulating, grinding, grouting, and cleaning of all marble, tile, mosaic, and terrazzo floors, and wainscoting, and such other work as is required in helping a mechanic as is the established custom of the trade. No limit to the tools, equipment or machinery used.

Prevailing Wage Rate Skilled Crafts

Name of Union: Bricklayer Local 8 Zone 2 Tile Setters & Finishers

Change # : LCN1-2020fbLoc6

Craft : Bricklayer Effective Date : 06/04/2020 Last Posted : 06/04/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Bricklayer Tile Setter	\$25.50		\$8.05	\$6.11	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$40.26	\$53.01
Marble Mason	\$25.50		\$8.05	\$6.11	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$40.26	\$53.01
Terrazzo worker	\$25.50		\$8.05	\$6.11	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$40.26	\$53.01
Finisher Support	\$22.91		\$8.05	\$6.11	\$0.58	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$37.65	\$49.11
Apprentice Finisher Support Only												
1st 30 days	\$13.75		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$13.75	\$20.62
30 days-6 months	\$13.75		\$8.05	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$21.80	\$28.67
2ND 6 months	\$16.04		\$8.05	\$6.11	\$0.58	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$30.78	\$38.80
3RD 6 months	\$17.18		\$8.05	\$6.11	\$0.58	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$31.92	\$40.51
4TH 6 months	\$18.33		\$8.05	\$6.11	\$0.58	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$33.07	\$42.24
5TH 6 months	\$19.47		\$8.05	\$6.11	\$0.58	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$34.21	\$43.94
6TH 6 months	\$20.62		\$8.05	\$6.11	\$0.58	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$35.36	\$45.67
Apprentice	Percent											
1st 30 Days	60.00	\$15.30	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$15.30	\$22.95
30 days- 6 months	60.00	\$15.30	\$8.05	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$23.35	\$31.00
2nd 6 months	70.00	\$17.85	\$8.05	\$6.11	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$32.61	\$41.54
3rd 6 months	75.00	\$19.12	\$8.05	\$6.11	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$33.89	\$43.45

4th 6 months	80.00	\$20.40	\$8.05	\$6.11	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$35.16	\$45.36
5th 6 months	85.00	\$21.67	\$8.05	\$6.11	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$36.44	\$47.27
6th 6 months	90.00	\$22.95	\$8.05	\$6.11	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$37.71	\$49.18
7th 6 months	95.00	\$24.22	\$8.05	\$6.11	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$38.99	\$51.10
8th 6 months	95.00	\$24.22	\$8.05	\$6.11	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$38.99	\$51.10

Special Calculation Note : Classification title contains "Bricklayer" because contract originates within the Bricklayer Local.

Note that the classification description is clarified after the local union number at the top of the page.

Ratio :

4 Journeymen to 1 Apprentice
 6 Journeymen to 1 Apprentice (Thereafter)

Jurisdiction (* denotes special jurisdictional note) :

BELMONT, CARROLL, HARRISON,
 JEFFERSON, MONROE, STARK,
 TUSCARAWAS

Special Jurisdictional Note :

Details :

Prevailing Wage Rate Skilled Crafts

Name of Union: Bricklayer Local 8 Zone 2 Tile Setters & Finishers

Change # : LCN1-2019fbLoc6

Craft : Bricklayer Effective Date : 06/01/2019 Last Posted : 05/29/2019

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Bricklayer Tile Setter	\$25.27		\$7.55	\$5.85	\$0.59	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$39.26	\$51.90
Marble Mason	\$25.27		\$7.55	\$5.85	\$0.59	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$39.26	\$51.90
Terrazzo worker	\$25.27		\$7.55	\$5.85	\$0.59	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$39.26	\$51.90
Finisher Support	\$22.68		\$7.55	\$5.85	\$0.57	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$36.65	\$47.99
APPRENTICE Finisher Support Only												
1st 30 days	\$13.61		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$13.61	\$20.41
30 days-6 months	\$13.61		\$7.55	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$21.16	\$27.96
2ND 6 months	\$15.88		\$7.55	\$5.85	\$0.57	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$29.85	\$37.79
3RD 6 months	\$17.01		\$7.55	\$5.85	\$0.57	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$30.98	\$39.49
4TH 6 months	\$18.14		\$7.55	\$5.85	\$0.57	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$32.11	\$41.18
5TH 6 months	\$19.28		\$7.55	\$5.85	\$0.57	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$33.25	\$42.89
6TH 6 months	\$20.41		\$7.55	\$5.85	\$0.57	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$34.38	\$44.59
Apprentice	Percent											
1st 30 Days	60.00	\$15.16	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$15.16	\$22.74
30 days- 6 months	60.00	\$15.16	\$7.55	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$22.71	\$30.29
2nd 6 months	70.00	\$17.69	\$7.55	\$5.85	\$0.59	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$31.68	\$40.52
3rd 6 months	75.00	\$18.95	\$7.55	\$5.85	\$0.59	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$32.94	\$42.42
4th 6 months	80.00	\$20.22	\$7.55	\$5.85	\$0.59	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$34.21	\$44.31
5th 6 months	85.00	\$21.48	\$7.55	\$5.85	\$0.59	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$35.47	\$46.21
6th 6 months	90.00	\$22.74	\$7.55	\$5.85	\$0.59	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$36.73	\$48.10
7th 6 months	95.00	\$24.01	\$7.55	\$5.85	\$0.59	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$38.00	\$50.00
8th 6 months	95.00	\$24.01	\$7.55	\$5.85	\$0.59	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$38.00	\$50.00

Special Calculation Note : Classification title contains "Bricklayer" because contract originates within the Bricklayer Local.

Note that the classification description is clarified after the local union number at the top of the

page.

Ratio :

4 Journeymen to 1 Apprentice
6 Journeymen to 1 Apprentice (Thereafter)

Jurisdiction (* denotes special jurisdictional note) :
BELMONT, CARROLL, HARRISON,
JEFFERSON, MONROE, STARK,
TUSCARAWAS

Special Jurisdictional Note :

Details :

Prevailing Wage Rate Skilled Crafts

Name of Union: Carpenter Commercial NE Zone 2B

Change # : LCN01-2020fbLocNEZone2B

Craft : Carpenter Effective Date : 05/28/2020 Last Posted : 05/28/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Carpenter	\$27.35		\$7.75	\$10.57	\$0.50	\$0.00	\$0.82	\$0.00	\$0.00	\$0.00	\$46.99	\$60.67
Apprentice	Percent											
1st 3 Months	60.00	\$16.41	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$16.41	\$24.62
2nd 3 Months	60.00	\$16.41	\$7.75	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$24.66	\$32.87
2nd 6 Months is 1st year	60.00	\$16.41	\$7.75	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$24.66	\$32.87
3rd 6 Months	60.00	\$16.41	\$7.75	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$24.66	\$32.87
4th 6 Months is 2nd year	60.00	\$16.41	\$7.75	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$24.66	\$32.87
5th 6 Months	70.00	\$19.14	\$7.75	\$7.40	\$0.50	\$0.00	\$0.57	\$0.00	\$0.00	\$0.00	\$35.37	\$44.94
6th 6 Months is 3rd year	75.00	\$20.51	\$7.75	\$7.93	\$0.50	\$0.00	\$0.62	\$0.00	\$0.00	\$0.00	\$37.31	\$47.57
7th 6 Months	80.00	\$21.88	\$7.75	\$8.46	\$0.50	\$0.00	\$0.66	\$0.00	\$0.00	\$0.00	\$39.25	\$50.19
8th 6 Months is 4th year	85.00	\$23.25	\$7.75	\$8.98	\$0.50	\$0.00	\$0.70	\$0.00	\$0.00	\$0.00	\$41.18	\$52.80

Special Calculation Note :

Ratio :

2 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

CARROLL, STARK, TUSCARAWAS, WAYNE

Special Jurisdictional Note :

Details :

LAWRENCE, LICKING, LOGAN, LORAIN,
LUCAS, MADISON, MAHONING, MARION,
MEDINA, MEIGS, MERCER, MIAMI, MONROE,
MONTGOMERY, MORGAN, MORROW,
MUSKINGUM, NOBLE, OTTAWA, PAULDING,
PERRY, PICKAWAY, PIKE, PORTAGE, PREBLE,
PUTNAM, RICHLAND, ROSS, SANDUSKY,
SCIOTO, SENECA, SHELBY, STARK, SUMMIT,
TRUMBULL, TUSCARAWAS, UNION, VAN
WERT, VINTON, WARREN, WASHINGTON,
WAYNE

Special Jurisdictional Note :

Details :

Prevailing Wage Rate Skilled Crafts

Name of Union: Carpenter Millwright NE Zone M3

Change # : LCN01-2020fbLocNEZoneM3

Craft : Carpenter Effective Date : 05/28/2020 Last Posted : 05/28/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Carpenter Millwright	\$29.81		\$7.75	\$10.30	\$0.50	\$0.00	\$1.87	\$0.05	\$0.00	\$0.00	\$50.28	\$65.18
Certified Welder	\$30.81		\$7.75	\$10.30	\$0.50	\$0.00	\$1.87	\$0.05	\$0.00	\$0.00	\$51.28	\$66.68
Lay-Out Man on Monorail	\$31.31		\$7.75	\$10.30	\$0.50	\$0.00	\$1.87	\$0.05	\$0.00	\$0.00	\$51.78	\$67.43
Apprentice	Percent											
1st 6 months	60.00	\$17.89	\$7.75	\$10.30	\$0.50	\$0.00	\$1.87	\$0.05	\$0.00	\$0.00	\$38.36	\$47.30
2nd 6 months	60.00	\$17.89	\$7.75	\$10.30	\$0.50	\$0.00	\$1.87	\$0.05	\$0.00	\$0.00	\$38.36	\$47.30
3rd 6 months	62.00	\$18.48	\$7.75	\$10.30	\$0.50	\$0.00	\$1.87	\$0.05	\$0.00	\$0.00	\$38.95	\$48.19
4th 6 months	65.50	\$19.53	\$7.75	\$10.30	\$0.50	\$0.00	\$1.87	\$0.05	\$0.00	\$0.00	\$40.00	\$49.76
5th 6 months	69.00	\$20.57	\$7.75	\$10.30	\$0.50	\$0.00	\$1.87	\$0.05	\$0.00	\$0.00	\$41.04	\$51.32
6th 6 months	72.50	\$21.61	\$7.75	\$10.30	\$0.50	\$0.00	\$1.87	\$0.05	\$0.00	\$0.00	\$42.08	\$52.89
7th 6 months	76.00	\$22.66	\$7.75	\$10.30	\$0.50	\$0.00	\$1.87	\$0.05	\$0.00	\$0.00	\$43.13	\$54.45
8th 6 months	80.00	\$23.85	\$7.75	\$10.30	\$0.50	\$0.00	\$1.87	\$0.05	\$0.00	\$0.00	\$44.32	\$56.24

Special Calculation Note : Other \$0.05 is UBC Millwright Promotional Fund

Ratio :

2 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

CARROLL, STARK, TUSCARAWAS, WAYNE

Special Jurisdictional Note :

Details :

The term "Millwright and Machine Erectors" jurisdiction shall mean the unloading, hoisting, rigging,

skidding, moving, dismantling, aligning, erecting, assembling, repairing, maintenance and adjusting of all structures, processing areas either under cover, under ground or elsewhere, required to process material, handle, manufacture or service, be it powered or receiving power manually, by steam, gas, electricity, gasoline, diesel, nuclear, solar, water, air or chemically, and in industries such as and including, which are identified for the purpose of description, but not limited to, the following: woodworking plants; canning industries; steel mills; coffee roasting plants; paper and pulp; cellophane; stone crushing; gravel and sand washing and handling; refineries; grain storage and handling; asphalt plants; sewage disposal; water plants; laundries; bakeries; mixing plants; can, bottle and bag packing plants; textile mills; paint mills; breweries; milk processing plants; power plants; aluminum processing or manufacturing plants; and amusement and entertainment fields. The installation of mechanical equipment in atomic energy plants; installation of reactors in power plants; installation of control rods and equipment in reactors; and installation of mechanical equipment in rocket missile bases, launchers, launching gantry, floating bases, hydraulic escape doors and any and all component parts thereto, either assembled, semi-assembled or disassembled. The installation of, but not limited to, the following: setting-up of all engines, motors, generators, air compressors, fans, pumps, scales, hoppers, conveyors of all types, sizes and their supports; escalators; man lifts; moving sidewalks; hoists; dumb waiters; all types of feeding machinery; amusement devices; mechanical pin setters and spotters in bowling alleys; refrigeration equipment; and the installation of all types of equipment necessary and required to process material either in the manufacturing or servicing. The handling and installation of pulleys, gears, sheaves, fly wheels, air and vacuum drives, worm drives and gear drives directly or indirectly coupled to motors, belts, chains, screws, legs, boots, guards, booth tanks, all bin valves, turn heads and indicators, shafting, bearings, cable sprockets, cutting all key seats in new and old work, troughs, chippers, filters, calendars, rolls, winders, rewinders, slitters, cutters, wrapping machines, blowers, forging machines, rams, hydraulic or otherwise, planing, extruder, ball, dust collectors, equipment in meat packing plants, splicing of ropes and cables. The laying-out, fabrication and installation of protection equipment including machinery guards, making and setting of templates for machinery, fabrication of bolts, nuts, pans, drilling of holes for any equipment which the Millwrights install regardless of materials; all welding and burning regardless of type, fabrication of all lines, hose or tubing used in lubricating machinery installed by Millwrights; grinding, cleaning, servicing and any machine work necessary for any part of any equipment installed by the Millwrights; and the break-in and trial run of any equipment or machinery installed by the Millwrights. It is agreed the Millwrights shall use the layout tools and optic equipment necessary to perform their work.

MARION, MEDINA, MEIGS, MERCER, MIAMI,
MONROE, MONTGOMERY, MORGAN,
MORROW, MUSKINGUM, NOBLE, OTTAWA,
PAULDING, PERRY, PICKAWAY, PIKE,
PORTAGE, PREBLE, PUTNAM, RICHLAND,
ROSS, SANDUSKY, SCIOTO, SENECA,
SHELBY, STARK, SUMMIT, TRUMBULL,
TUSCARAWAS, UNION, VAN WERT, VINTON,
WARREN, WASHINGTON, WAYNE,
WILLIAMS, WOOD, WYANDOT

Special Jurisdictional Note : Industrial Dock and Door is the installation of overhead doors, roll up doors and dock leveling equipment

Details :

10/27/10 New Contract jc

Prevailing Wage Rate Skilled Crafts

Name of Union: Carpenter Insulation NE Zone 2B

Change # : LCN01-2020fbLocNEZone2B

Craft : Carpenter Effective Date : 05/28/2020 Last Posted : 05/28/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Carpenter Insulation	\$21.88		\$7.75	\$10.57	\$0.50	\$0.00	\$0.82	\$0.00	\$0.00	\$0.00	\$41.52	\$52.46
Apprentice	Percent											
1st 3 months	50.00	\$10.94	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$10.94	\$16.41
2nd 3 months	50.00	\$10.94	\$7.75	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$19.19	\$24.66
2nd 6 months	50.00	\$10.94	\$7.75	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$19.19	\$24.66
3rd 6 months	55.00	\$12.03	\$7.75	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$20.28	\$26.30
4th 6 months	60.00	\$13.13	\$7.75	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$21.38	\$27.94
5th 6 months	70.00	\$15.32	\$7.75	\$7.40	\$0.50	\$0.00	\$0.57	\$0.00	\$0.00	\$0.00	\$31.54	\$39.19
6th 6 months	75.00	\$16.41	\$7.75	\$7.93	\$0.50	\$0.00	\$0.62	\$0.00	\$0.00	\$0.00	\$33.21	\$41.42
7th 6 months	80.00	\$17.50	\$7.75	\$8.46	\$0.50	\$0.00	\$0.66	\$0.00	\$0.00	\$0.00	\$34.87	\$43.63
8th 6 months	85.00	\$18.60	\$7.75	\$8.98	\$0.50	\$0.00	\$0.70	\$0.00	\$0.00	\$0.00	\$36.53	\$45.83

Special Calculation Note : No special calculations for this skilled craft wage rate are required at this time.

Ratio :

2 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

CARROLL, STARK, TUSCARAWAS, WAYNE

Special Jurisdictional Note :

Details :

Prevailing Wage Rate Skilled Crafts

Name of Union: Carpenter Pile Driver NE Zone P3

Change # : LCN01-2020fbLocNEZoneP3

Craft : Carpenter Effective Date : 05/28/2020 Last Posted : 05/28/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Carpenter Pile Driver	\$27.16		\$7.75	\$10.30	\$0.50	\$0.00	\$1.83	\$0.00	\$0.00	\$0.00	\$47.54	\$61.12
Diver	\$40.74		\$7.75	\$10.30	\$0.50	\$0.00	\$1.83	\$0.00	\$0.00	\$0.00	\$61.12	\$81.49
Certified Welder	\$28.21		\$7.75	\$10.30	\$0.50	\$0.00	\$1.83	\$0.00	\$0.00	\$0.00	\$48.59	\$62.69
Apprentice	Percent											
1st 6 months	60.00	\$16.30	\$7.75	\$10.30	\$0.50	\$0.00	\$1.83	\$0.00	\$0.00	\$0.00	\$36.68	\$44.82
2nd 6 months	60.00	\$16.30	\$7.75	\$10.30	\$0.50	\$0.00	\$1.83	\$0.00	\$0.00	\$0.00	\$36.68	\$44.82
3rd 6 months	62.00	\$16.84	\$7.75	\$10.30	\$0.50	\$0.00	\$1.83	\$0.00	\$0.00	\$0.00	\$37.22	\$45.64
4th 6 months	65.50	\$17.79	\$7.75	\$10.30	\$0.50	\$0.00	\$1.83	\$0.00	\$0.00	\$0.00	\$38.17	\$47.06
5th 6 months	69.00	\$18.74	\$7.75	\$10.30	\$0.50	\$0.00	\$1.83	\$0.00	\$0.00	\$0.00	\$39.12	\$48.49
6th 6 months	72.50	\$19.69	\$7.75	\$10.30	\$0.50	\$0.00	\$1.83	\$0.00	\$0.00	\$0.00	\$40.07	\$49.92
7th 6 months	76.00	\$20.64	\$7.75	\$10.30	\$0.50	\$0.00	\$1.83	\$0.00	\$0.00	\$0.00	\$41.02	\$51.34
8th 6 months	80.00	\$21.73	\$7.75	\$10.30	\$0.50	\$0.00	\$1.83	\$0.00	\$0.00	\$0.00	\$42.11	\$52.97

Special Calculation Note : No special calculations for this skilled craft wage rate are required at this time.

Ratio :

2 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

STARK, WAYNE, CARROLL, TUSCARAWAS

Special Jurisdictional Note :

Details :

Pile Drivers duties shall include but not limited to: Pile driving, milling, fashioning, joining assembling,

erecting, fastening, or dismantling of all material of wood, plastic, metal, fiber, cork and composition and all other substitute materials: pile driving, cutting, fitting and placing of lagging, and the handling, cleaning, erecting, installing and dismantling of machinery, equipment and erecting pre-engineered metal buildings. Pile Drivers work but not limited to: unloading, assembling, erection, repairs, operation, signaling, dismantling and reloading all equipment that is used for pile driving including pile butts is defined as sheeting or scrap piling. Underwater work that may be required in connection with the installation of piling. The driver and his tender work as a team and shall arrive at their own financial arrangements with the contractor. Any configuration of wood, steel, concrete or composite that is jetted, driven or vibrated onto the ground by conventional pile driving equipment for the purpose of supporting a future load that may be permanent or temporary. The construction of all wharves and docks, including the fabrication and installation of floating docks. Driving bracing, plumbing, cutting off and capping of all piling whether wood, metal, pipe piling or composite, loading, unloading, erecting, framing, dismantling, moving and handling of pile driving equipment piling used in the construction and repair of all wharves, docks, piers, trestles, caissons, cofferdams and erection of all sea walls and breakwaters. All underwater and marine work on bulkheads, wharves, docks, shipyards, caissons, piers, bridges, pipeline, work, viaducts, marine cable and trestles, as well as salvage and reclamation work where divers are employed. Rate shall include carpenters, acoustic and ceiling installers, drywall installers, pile drivers and floorlayers.

Prevailing Wage Rate Skilled Crafts

Name of Union: Carpenter Floorlayer NE Zone 2B

Change # : LCN01-2020fbLocNEZone2B

Craft : Carpenter Effective Date : 05/28/2020 Last Posted : 05/28/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Carpenter Floorlayer	\$27.35		\$7.75	\$10.57	\$0.52	\$0.00	\$0.82	\$0.00	\$0.00	\$0.00	\$47.01	\$60.69
Apprentice	Percent											
1st 3 Months	60.00	\$16.41	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$16.41	\$24.62
2nd 3 Months	60.00	\$16.41	\$7.75	\$0.00	\$0.52	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$24.68	\$32.89
2nd 6 Months is 1st year	60.00	\$16.41	\$7.75	\$0.00	\$0.52	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$24.68	\$32.89
3rd 6 Months	60.00	\$16.41	\$7.75	\$0.00	\$0.52	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$24.68	\$32.89
4th 6 Months is 2nd year	60.00	\$16.41	\$7.75	\$0.00	\$0.52	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$24.68	\$32.89
5th 6 Months	70.00	\$19.14	\$7.75	\$7.40	\$0.52	\$0.00	\$0.57	\$0.00	\$0.00	\$0.00	\$35.39	\$44.96
6th 6 Months is 3rd year	75.00	\$20.51	\$7.75	\$7.93	\$0.52	\$0.00	\$0.62	\$0.00	\$0.00	\$0.00	\$37.33	\$47.59
7th 6 Months	80.00	\$21.88	\$7.75	\$8.46	\$0.52	\$0.00	\$0.66	\$0.00	\$0.00	\$0.00	\$39.27	\$50.21
8th 6 Months is 4th year	85.00	\$23.25	\$7.75	\$8.98	\$0.52	\$0.00	\$0.70	\$0.00	\$0.00	\$0.00	\$41.20	\$52.82

Special Calculation Note :

Ratio :

2 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

CARROLL, STARK, TUSCARAWAS, WAYNE

Special Jurisdictional Note :

Details :

Prevailing Wage Rate Skilled Crafts

Name of Union: Cement Mason Bricklayer Local 97 HevHwy A

Change # : LCN01-2020fbHvyHwy

Craft : Bricklayer Effective Date : 06/01/2020 Last Posted : 05/21/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Cement Mason Bricklayer Sewer Water Works A	\$29.96	\$9.50	\$6.77	\$0.47	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$46.70	\$61.68
Apprentice	Percent											
1st year	50.00	\$14.98	\$9.50	\$6.77	\$0.47	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$31.72	\$39.21
2nd year	70.00	\$20.97	\$9.50	\$6.77	\$0.47	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$37.71	\$48.20
3rd year	90.00	\$26.96	\$9.50	\$6.77	\$0.47	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$43.70	\$57.19

Special Calculation Note : NOT FOR BUILDING CONSTRUCTION.

Ratio :

- 3 Journeymen to 1 Apprentice
- 6 Journeymen to 2 Apprentice
- 9 Journeymen to 3 Apprentice
- 12 Journeymen to 4 Apprentice
- 15 Journeymen to 5 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

- ADAMS, ALLEN, ASHLAND, ASHTABULA, ATHENS, AUGLAIZE, BELMONT, BROWN, BUTLER, CARROLL, CHAMPAIGN, CLARK, CLERMONT, CLINTON, COLUMBIANA, COSHOCTON, CRAWFORD, CUYAHOGA, DARKE, DEFIANCE, DELAWARE, ERIE, FAIRFIELD, FAYETTE, FRANKLIN, FULTON, GALLIA, GEauga, GREENE, GUERNSEY, HAMILTON, HANCOCK, HARDIN, HARRISON, HENRY, HIGHLAND, HOCKING, HOLMES, HURON, JACKSON, JEFFERSON, KNOX, LAKE, LAWRENCE, LICKING, LOGAN, LORAIN, LUCAS, MADISON, MAHONING, MARION, MEDINA, MEIGS, MERCER, MIAMI, MONROE, MONTGOMERY, MORGAN, MORROW, MUSKINGUM, NOBLE, OTTAWA, PAULDING, PERRY, PICKAWAY, PIKE, PORTAGE, PREBLE, PUTNAM, RICHLAND, ROSS, SANDUSKY, SCIOTO, SENECA,

SHELBY, STARK, SUMMIT, TRUMBULL,
TUSCARAWAS, UNION, VAN WERT, VINTON,
WARREN, WASHINGTON, WAYNE

Special Jurisdictional Note :

Details :

(A) Highway Construction, Sewer, Waterworks And Utility Construction, Industrial & Building Site Heavy Construction, Airport Construction Or Railroad Construction Work.

(B) Power Plant, Tunnels, Amusement Park, Athletic Stadium Site Work ,Pollution Control,Sewer Plant, Waste Plant, & Water Treatment Facilities, Construction.

Prevailing Wage Rate Skilled Crafts

Name of Union: Cement Mason Bricklayer Local 97 HevHwy B

Change # : LCN01-2020fbHvyHwy

Craft : Bricklayer Effective Date : 06/01/2020 Last Posted : 05/21/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Cement Mason Bricklayer Power Plants Tunnels Amusement Parks B	\$30.95		\$9.50	\$6.77	\$0.48	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$47.70	\$63.17
Apprentice	Percent											
1st year	50.00	\$15.48	\$9.50	\$6.77	\$0.48	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$32.23	\$39.96
2nd year	70.00	\$21.66	\$9.50	\$6.77	\$0.48	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$38.42	\$49.25
3rd year	90.00	\$27.85	\$9.50	\$6.77	\$0.48	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$44.60	\$58.53

Special Calculation Note : NOT FOR BUILDING CONSTRUCTION.

Ratio :

- 3 Journeymen to 1 Apprentice
- 6 Journeymen to 2 Apprentice
- 9 Journeymen to 2 Apprentice
- 12 Journeymen to 4 Apprentice
- 15 Journeymen to 5 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

- ADAMS, ALLEN, ASHLAND, ASHTABULA,
- ATHENS, AUGLAIZE, BELMONT, BROWN,
- BUTLER, CARROLL, CHAMPAIGN, CLARK,
- CLERMONT, CLINTON, COLUMBIANA,
- COSHOCTON, CRAWFORD, CUYAHOGA,
- DARKE, DEFIANCE, DELAWARE, ERIE,
- FAIRFIELD, FAYETTE, FRANKLIN, FULTON,
- GALLIA, GEAUGA, GREENE, GUERNSEY,
- HAMILTON, HANCOCK, HARDIN, HARRISON,
- HENRY, HIGHLAND, HOCKING, HOLMES,
- HURON, JACKSON, JEFFERSON, KNOX,
- LAKE, LAWRENCE, LICKING, LOGAN,
- LORAIN, LUCAS, MADISON, MAHONING,
- MARION, MEDINA, MEIGS, MERCER, MIAMI,
- MONROE, MONTGOMERY, MORGAN,
- MORROW, MUSKINGUM, NOBLE, OTTAWA,
- PAULDING, PERRY, PICKAWAY, PIKE,

PORTAGE, PREBLE, PUTNAM, RICHLAND,
ROSS, SANDUSKY, SCIOTO, SENECA,
SHELBY, STARK, SUMMIT, TRUMBULL,
TUSCARAWAS, UNION, VAN WERT, VINTON,
WARREN, WASHINGTON, WAYNE

Special Jurisdictional Note :

Details :

(A) Highway Construction, Sewer, Waterworks And Utility Construction, Industrial & Building Site Heavy Construction, Airport Construction Or Railroad Construction Work.

(B) Power Plant, Tunnels, Amusement Park, Athletic Stadium Site Work ,Pollution Control,Sewer Plant, Waste Plant, & Water Treatment Facilities, Construction.

Prevailing Wage Rate Skilled Crafts

Name of Union: Cement Mason Statewide Hwy Exhibit A District II

Change # : LCN01-2020fbCementHwy

Craft : Cement Mason Effective Date : 05/01/2020 Last Posted : 04/30/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Cement Mason	\$30.11		\$8.25	\$7.15	\$0.65	\$0.00	\$2.25	\$0.00	\$0.00	\$0.00	\$48.41	\$63.46
Apprentice	Percent											
1st Year	70.00	\$21.08	\$8.25	\$7.15	\$0.65	\$0.00	\$2.25	\$0.00	\$0.00	\$0.00	\$39.38	\$49.92
2nd Year	80.00	\$24.09	\$8.25	\$7.15	\$0.65	\$0.00	\$2.25	\$0.00	\$0.00	\$0.00	\$42.39	\$54.43
3rd Year	90.00	\$27.10	\$8.25	\$7.15	\$0.65	\$0.00	\$2.25	\$0.00	\$0.00	\$0.00	\$45.40	\$58.95

Special Calculation Note : No special calculations for this skilled craft wage rate are required at this time.

Ratio :

1 Journeymen to 1 Apprentice
2 to 1 thereafter

Jurisdiction (* denotes special jurisdictional note) :

BROWN, BUTLER, CLERMONT, COLUMBIANA, DEFIANCE, ERIE, HAMILTON, HIGHLAND, HURON, LORAIN, MAHONING, MEDINA, OTTAWA, PAULDING, PORTAGE, SANDUSKY, SENECA, STARK, SUMMIT, TRUMBULL, WARREN, WILLIAMS

Special Jurisdictional Note : (A) Highway Construction, Sewer, Waterworks And Utility Construction, Industrial & Building Site, Heavy Construction, Airport Construction Or Railroad Construction Work.

Details :

Prevailing Wage Rate Skilled Crafts

Name of Union: Cement Mason Statewide Hwy Exhibit B District II

Change # : LCN01-2019fbCementHwy

Craft : Cement Mason Effective Date : 05/01/2020 Last Posted : 04/30/2020

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Cement Mason	\$30.98		\$8.25	\$7.15	\$0.65	\$0.00	\$2.25	\$0.00	\$0.00	\$0.00	\$49.28	\$64.77
Apprentice	Percent											
1st Year	70.00	\$21.69	\$8.25	\$7.15	\$0.65	\$0.00	\$2.25	\$0.00	\$0.00	\$0.00	\$39.99	\$50.83
2nd Year	80.00	\$24.78	\$8.25	\$7.15	\$0.65	\$0.00	\$2.25	\$0.00	\$0.00	\$0.00	\$43.08	\$55.48
3rd Year	90.00	\$27.88	\$8.25	\$7.15	\$0.65	\$0.00	\$2.25	\$0.00	\$0.00	\$0.00	\$46.18	\$60.12

Special Calculation Note : No special calculations for this skilled craft wage rate are required at this time.

Ratio :

1 Journeymen to 1 Apprentice
2 to 1 thereafter

Jurisdiction (* denotes special jurisdictional note) :

BROWN, BUTLER, CLERMONT, COLUMBIANA, DEFIANCE, ERIE, HAMILTON, HIGHLAND, HURON, LORAIN, MAHONING, MEDINA, OTTAWA, PAULDING, PORTAGE, SANDUSKY, SENECA, STARK, SUMMIT, TRUMBULL, WARREN, WILLIAMS

Special Jurisdictional Note : (B) Power Plant, Tunnels, Amusement Park, Athletic Stadium Site Work ,Pollution Control,Sewer Plant, Waste Plant, & Water Treatment Facilities, Construction.

Details :

Prevailing Wage Rate Skilled Crafts

Name of Union: Cement Mason & Plasterer Local 109

Change # : LCN01-2020fbLoc109

Craft : Cement Effective Date : 07/09/2020 Last Posted : 07/09/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Cement Mason	\$30.04		\$8.89	\$7.15	\$0.40	\$0.00	\$4.25	\$0.06	\$0.00	\$0.00	\$50.79	\$65.81
Plasterer	\$29.33		\$8.39	\$7.15	\$0.40	\$0.00	\$4.00	\$0.06	\$0.00	\$0.00	\$49.33	\$64.00
Apprentice Cement Mason	Percent											
1st year	70.52	\$21.18	\$8.89	\$7.15	\$0.40	\$0.00	\$4.25	\$0.06	\$0.00	\$0.00	\$41.93	\$52.53
2nd year	80.36	\$24.14	\$8.89	\$7.15	\$0.40	\$0.00	\$4.25	\$0.06	\$0.00	\$0.00	\$44.89	\$56.96
3rd year	90.18	\$27.09	\$8.89	\$7.15	\$0.40	\$0.00	\$4.25	\$0.06	\$0.00	\$0.00	\$47.84	\$61.39
Plasterer Apprentice												
1st year	68.89	\$20.69	\$8.39	\$7.15	\$0.40	\$0.00	\$4.00	\$0.06	\$0.00	\$0.00	\$40.69	\$51.04
2nd year	78.45	\$23.57	\$8.39	\$7.15	\$0.40	\$0.00	\$4.00	\$0.06	\$0.00	\$0.00	\$43.57	\$55.35
3rd year	88.05	\$26.45	\$8.39	\$7.15	\$0.40	\$0.00	\$4.00	\$0.06	\$0.00	\$0.00	\$46.45	\$59.68

Special Calculation Note : Other is for International Training.

Ratio :

1 Journeymen to 1 Apprentice
5 Journeymen to 2 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

CARROLL, HOLMES, MEDINA, PORTAGE,
STARK, SUMMIT, TUSCARAWAS, WAYNE

Special Jurisdictional Note :

Details :

Finishers when applying colorshake shall be paid an additional \$2.00 per DAY.
Swing Scaffolds up to 50 feet shall be paid \$0.25 above the Journeymen rate.
Swing Scaffolds over 50 feet shall be paid \$0.35 above the Journeymen rate.

Prevailing Wage Rate Skilled Crafts

Name of Union: Electrical Local 540 Inside

Change # : LCN01-2020fbLoc540in

Craft : Electrical Effective Date : 01/05/2021 Last Posted : 01/05/2021

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Electrician	\$34.00		\$6.40	\$9.70	\$1.05	\$3.40	\$3.83	\$1.12	\$0.00	\$0.00	\$59.50	\$76.50
Apprentice	Percent											
1st 1000 hrs	40.00	\$13.60	\$6.40	\$0.00	\$0.38	\$0.00	\$0.00	\$0.41	\$0.00	\$0.00	\$20.79	\$27.59
2nd 1000 hrs	45.00	\$15.30	\$6.40	\$0.00	\$0.43	\$0.00	\$0.00	\$0.46	\$0.00	\$0.00	\$22.59	\$30.24
3rd 1500 hrs	50.00	\$17.00	\$6.40	\$1.94	\$0.51	\$1.36	\$0.77	\$0.55	\$0.00	\$0.00	\$28.53	\$37.03
4th 1500 hrs	60.00	\$20.40	\$6.40	\$3.88	\$0.62	\$1.63	\$1.53	\$0.66	\$0.00	\$0.00	\$35.12	\$45.32
5th 1500 hrs	70.00	\$23.80	\$6.40	\$5.82	\$0.72	\$1.90	\$2.30	\$0.77	\$0.00	\$0.00	\$41.71	\$53.61
6th 1500 hrs	80.00	\$27.20	\$6.40	\$7.76	\$0.82	\$2.18	\$3.06	\$0.88	\$0.00	\$0.00	\$48.30	\$61.90

Special Calculation Note : OTHER = (NEBF) National Electrical Benefit Fund. Vacation contribution is equal to 8% of the gross weekly wages.

Ratio :

The first person assigned to any job site shall be a Journeyman Wireman. Ratio thereafter:

- 1-3 Journeymen to 2 Apprentices
- 4 to 6 Journeymen up to 4 Apprentices
- 7 to 9 Journeymen up to 6 Apprentices

Jurisdiction (* denotes special jurisdictional note) :

CARROLL*, COLUMBIANA*, HOLMES, MAHONING*, STARK, TUSCARAWAS*, WAYNE*

Special Jurisdictional Note : Carroll County: North half including; Fox, Harrison, Rose and Washington Townships.

Columbiana County: Knox Township only.

Mahoning County: Smith Township only.

Tuscarawas County: That portion North of Auburn, Clay, Rush and York Townships.

Wayne County: That portion south of Baughman, Chester, Green, Wayne and Wooster Townships.

Details :

Prevailing Wage Rate Skilled Crafts

Name of Union: Electrical Local 540 Inside Lt Commercial Northern

Change # : LCN01-2021fbLoc540in

Craft : Electrical Effective Date : 01/05/2021 Last Posted : 01/05/2021

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Electrician	\$34.00		\$6.40	\$9.70	\$1.05	\$3.40	\$3.83	\$1.12	\$0.00	\$0.00	\$59.50	\$76.50
CE-3 12,001-14,000 Hrs	\$25.63		\$6.15	\$0.00	\$0.83	\$0.00	\$0.77	\$0.77	\$0.00	\$0.00	\$34.15	\$46.97
CE-2 10,001-12,000 Hrs	\$20.14		\$6.15	\$0.00	\$0.83	\$0.00	\$0.60	\$0.60	\$0.00	\$0.00	\$28.32	\$38.39
CE-1 8,001-10,000 Hrs	\$18.31		\$6.15	\$0.00	\$0.83	\$0.00	\$0.55	\$0.55	\$0.00	\$0.00	\$26.39	\$35.54
CW-4 6,001-8,000 Hrs	\$16.48		\$6.15	\$0.00	\$0.83	\$0.00	\$0.49	\$0.49	\$0.00	\$0.00	\$24.44	\$32.68
CW-3 4,001-6,000 Hrs	\$14.65		\$6.15	\$0.00	\$0.83	\$0.00	\$0.44	\$0.44	\$0.00	\$0.00	\$22.51	\$29.83
CW-2 2,001-4,000 Hrs	\$13.73		\$6.15	\$0.00	\$0.83	\$0.00	\$0.41	\$0.41	\$0.00	\$0.00	\$21.53	\$28.39
CW-1 0-2,000 Hrs	\$12.82		\$6.15	\$0.00	\$0.83	\$0.00	\$0.38	\$0.38	\$0.00	\$0.00	\$20.56	\$26.97
Apprentice	Percent											
1st 1000 hrs	40.00	\$13.60	\$6.40	\$0.00	\$0.38	\$0.00	\$0.00	\$0.41	\$0.00	\$0.00	\$20.79	\$27.59
2nd 1000 hrs	45.00	\$15.30	\$6.40	\$0.00	\$0.43	\$0.00	\$0.00	\$0.46	\$0.00	\$0.00	\$22.59	\$30.24
3rd 1500 hrs	50.00	\$17.00	\$6.40	\$1.94	\$0.51	\$1.36	\$0.77	\$0.55	\$0.00	\$0.00	\$28.53	\$37.03
4th 1500 hrs	60.00	\$20.40	\$6.40	\$3.88	\$0.62	\$1.63	\$1.53	\$0.66	\$0.00	\$0.00	\$35.12	\$45.32
5th 1500 hrs	70.00	\$23.80	\$6.40	\$5.82	\$0.72	\$1.90	\$2.30	\$0.77	\$0.00	\$0.00	\$41.71	\$53.61
6th 1500 hrs	80.00	\$27.20	\$6.40	\$7.76	\$0.82	\$2.18	\$3.06	\$0.88	\$0.00	\$0.00	\$48.30	\$61.90

Special Calculation Note : OTHER = (NEBF) National Electrical Benefit Fund

Ratio :

1 to 3 Journeymen to 2 Apprentices
 4 to 6 Journeymen up to 4 Apprentices
 7 to 9 Journeymen up to 6 Apprentices

Jurisdiction (* denotes special jurisdictional note) :

CARROLL*, COLUMBIANA*, HOLMES,
 MAHONING*, STARK, TUSCARAWAS*, WAYNE*

Construction Electrician and Construction Wireman Ratio

There shall be a minimum ratio of one inside Journeyman Wireman to every (4) employees of different classifications per jobsite. An Inside Journeyman Wireman is required on the project as the fifth (5th) worker or when apprentices are used.

Special Jurisdictional Note : Carroll County: North half including; Fox, Harrison, Rose and Washington Townships.

Columbiana County: Knox Township only.

Mahoning County: Smith Township only.

Tuscarawas County: That portion North of Auburn, Clay, Rush and York Townships.

Wayne County: That portion south of Baughman, Chester, Green, Wayne and Wooster Townships.

The scope of work for the light commercial agreement shall apply to the following small medical clinics, stand-alone doctor and dentist offices with up to 600 amp service (not attached to a hospital), gas stations/convenience stores, fast food restaurants and franchised chain restaurants including independent bars and taverns, places of worship, funeral homes, nursing homes, assisted living facilities and day-care facilities under 15,000 sq ft, small office, retail/wholesale facilities under 15,000 sq ft with less than 10 units attached, storage units, car washes, express hotels and motels (4 stories or less) without conference or restaurants facilities, residential units (subject to Davis Bacon Rates) small stand-alone manufacturing facilities when free standing and not part of a larger facility (less than 15,000 sq ft) solar projects (500 panels or less) unless other wise covered under this agreement, lighting retrofits (when not associated with remodels involving branch re-circuiting) Lighting retrofits shall be defined as the changing of lamps and ballasts in existing light fixtures and shall also include the one for one replacement of existing fixtures.

Details :

Prevailing Wage Rate Skilled Crafts

Name of Union: Electrical Local 540 Voice Data Video

Change # : LCN01-2020fbLoc540VDV

Craft : Voice Data Video Effective Date : 10/15/2020 Last Posted : 10/15/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Electrical Installer Technician	\$22.85		\$6.30	\$4.79	\$0.57	\$2.29	\$1.83	\$0.75	\$0.00	\$0.00	\$39.38	\$50.81
Cable Puller	\$13.02		\$6.30	\$0.00	\$0.29	\$0.00	\$0.39	\$0.39	\$0.00	\$0.00	\$20.39	\$26.90
Apprentice Starting Prior to 08/01/2020												
2nd Step 65%	\$14.85		\$6.30	\$0.00	\$0.36	\$1.19	\$0.00	\$0.48	\$0.00	\$0.00	\$23.18	\$30.60
3rd Step 75%	\$17.14		\$6.30	\$4.79	\$0.42	\$1.37	\$1.83	\$0.56	\$0.00	\$0.00	\$32.41	\$40.98
4th Step 80%	\$18.28		\$6.30	\$4.79	\$0.44	\$1.46	\$1.83	\$0.59	\$0.00	\$0.00	\$33.69	\$42.83
5th Step 85%	\$19.42		\$6.30	\$4.79	\$0.47	\$1.55	\$1.83	\$0.63	\$0.00	\$0.00	\$34.99	\$44.70
6th Step 90%	\$20.57		\$6.30	\$4.79	\$0.50	\$1.65	\$1.83	\$0.67	\$0.00	\$0.00	\$36.31	\$46.60
Apprentice Starting After 08/01/2020	Percent											
1st Step	60.00	\$13.71	\$6.30	\$0.00	\$0.31	\$0.00	\$1.10	\$0.41	\$0.00	\$0.00	\$21.83	\$28.69
2nd Step	65.00	\$14.85	\$6.30	\$3.11	\$0.36	\$1.19	\$1.19	\$0.48	\$0.00	\$0.00	\$27.48	\$34.91
3rd Step	75.00	\$17.14	\$6.30	\$3.59	\$0.42	\$1.37	\$1.37	\$0.56	\$0.00	\$0.00	\$30.75	\$39.32
4th Step	85.00	\$19.42	\$6.30	\$4.07	\$0.47	\$1.55	\$1.56	\$0.63	\$0.00	\$0.00	\$34.00	\$43.71

Special Calculation Note : OTHER = (NEBF) National Electrical Benefit Fund.

VACATION PAY - For Journeymen is 10% of wages and 8% for Apprentices.

Ratio :

Jurisdiction (* denotes special jurisdictional note) :

1-3 Journeyman to 2 Apprentice
4-6 Journeyman to 4 Apprentice

CARROLL*, COLUMBIANA*, HOLMES,
MAHONING*, STARK, TUSCARAWAS*,
WAYNE*

** Exception - When fire alarm falls within the scope of this addendum, Cable Pullers can be used to aid in test and be the 2nd Teledata employee on the job

Special Jurisdictional Note : Carroll County includes the following townships: North half including Fox, Harrison, Rose and Washington. Tuscarawas County includes the following townships: The portion North of Auburn, Clay, Rush and York. Wayne County includes the following townships: The portion South of Baughman, Chester, Green, and Wayne. Columbiana County includes Knox township. Mahoning County includes Smith township.

Details :

CABLE PULLERS - are for the installation of cable from one termination point to another.

The following work is EXCLUDED from the Teledata Technician work scope:

- * - Installation of computer systems in industrial applications such as assembly lines, robotics, computer controller manufacturing systems.
- * - Installation of conduit and/ or raceways shall be installed by Inside Wireman . On sites where there is no Inside Wireman employed, the Teledata Technician may install raceway, or conduit not greater than 10 feet.
- * - Fire Alarm work on all new construction sites or wherever the fire alarm system is installed in conduit.
- * - All HVAC control work.

Prevailing Wage Rate Skilled Crafts

Name of Union: Electrical Local 71 High Tension Pipe Type Cable

Change # : LCN01-2019fbLoc7

Craft : Lineman Effective Date : 04/24/2019 Last Posted : 04/24/2019

	BHR	Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
		H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification											
Electrical Lineman	\$43.48	\$6.00	\$1.30	\$0.43	\$0.00	\$10.00	\$0.35	\$0.00	\$0.00	\$61.56	\$83.30
Certified Lineman Welder	\$43.48	\$6.00	\$1.30	\$0.43	\$0.00	\$10.00	\$0.35	\$0.00	\$0.00	\$61.56	\$83.30
Certified Cable Splicer	\$43.48	\$6.00	\$1.30	\$0.43	\$0.00	\$10.00	\$0.35	\$0.00	\$0.00	\$61.56	\$83.30
Operator A	\$39.02	\$6.00	\$1.17	\$0.39	\$0.00	\$8.97	\$0.35	\$0.00	\$0.00	\$55.90	\$75.41
Operator B	\$34.60	\$6.00	\$1.04	\$0.35	\$0.00	\$7.96	\$0.35	\$0.00	\$0.00	\$50.30	\$67.60
Operator C	\$27.93	\$6.00	\$0.84	\$0.28	\$0.00	\$6.42	\$0.35	\$0.00	\$0.00	\$41.82	\$55.79
Groundman 0-12 months Exp	\$21.74	\$6.00	\$0.65	\$0.22	\$0.00	\$5.00	\$0.35	\$0.00	\$0.00	\$33.96	\$44.83
Groundman 0-12 months Exp w/CDL	\$23.91	\$6.00	\$0.72	\$0.24	\$0.00	\$5.50	\$0.35	\$0.00	\$0.00	\$36.72	\$48.68
Groundman 1 yr or more	\$23.91	\$6.00	\$0.72	\$0.24	\$0.00	\$5.50	\$0.35	\$0.00	\$0.00	\$36.72	\$48.68
Groundman 1 yr or more w/CDL	\$28.26	\$6.00	\$0.85	\$0.28	\$0.00	\$6.50	\$0.35	\$0.00	\$0.00	\$42.24	\$56.37
Equipment Mechanic A	\$34.60	\$6.00	\$1.04	\$0.35	\$0.00	\$7.96	\$0.35	\$0.00	\$0.00	\$50.30	\$67.60
Equipment Mechanic B	\$31.26	\$6.00	\$0.94	\$0.31	\$0.00	\$7.19	\$0.35	\$0.00	\$0.00	\$46.05	\$61.68
Equipment Mechanic C	\$27.93	\$6.00	\$0.84	\$0.28	\$0.00	\$6.42	\$0.35	\$0.00	\$0.00	\$41.82	\$55.79

X-Ray Technician	\$43.48	\$6.00	\$1.30	\$0.43	\$0.00	\$10.00	\$0.35	\$0.00	\$0.00	\$61.56	\$83.30	
Apprentice	Percent											
1st 1000 hrs	60.00	\$26.09	\$6.00	\$0.78	\$0.26	\$0.00	\$6.00	\$0.35	\$0.00	\$0.00	\$39.48	\$52.52
2nd 1000 hrs	65.00	\$28.26	\$6.00	\$0.85	\$0.28	\$0.00	\$6.50	\$0.35	\$0.00	\$0.00	\$42.24	\$56.37
3rd 1000 hrs	70.00	\$30.44	\$6.00	\$0.91	\$0.30	\$0.00	\$7.00	\$0.35	\$0.00	\$0.00	\$45.00	\$60.21
4th 1000 hrs	75.00	\$32.61	\$6.00	\$0.98	\$0.33	\$0.00	\$7.50	\$0.35	\$0.00	\$0.00	\$47.77	\$64.07
5th 1000 hrs	80.00	\$34.78	\$6.00	\$1.04	\$0.35	\$0.00	\$8.00	\$0.35	\$0.00	\$0.00	\$50.52	\$67.92
6th 1000 hrs	85.00	\$36.96	\$6.00	\$1.11	\$0.37	\$0.00	\$8.50	\$0.35	\$0.00	\$0.00	\$53.29	\$71.77
7th 1000 hrs	90.00	\$39.13	\$6.00	\$1.17	\$0.39	\$0.00	\$9.00	\$0.35	\$0.00	\$0.00	\$56.04	\$75.61

Special Calculation Note : Other is Health Retirement Account

Operator "A"

John Henry Rock Drill, D-6 (or equivalent) and above, Trackhoe Digger, (320 Track excavator), Cranes (greater then 25 tons and less than 45 tons).

Operator "B"

Cranes (greater than 6 tons and up to 25 tons), Backhoes, Road Tractor, Dozer up to D-5, Pressure Digger- wheeled or tracked, all Tension wire Stringing equipment.

Operator "C"

Trench, Backhoe, Riding type vibratory Compactor, Ground Rod Driver, Boom Truck (6 ton & below), Skid Steer Loaders, Material Handler.

*All Operators of cranes 45 ton or larger shall be paid the journeyman rate of pay. \$0.30 is for Health Retirement Account.

Ratio :

1 Journeyman to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

ADAMS, ASHLAND, ASHTABULA, ATHENS, AUGLAIZE, BELMONT, BROWN, BUTLER, CARROLL, CHAMPAIGN, CLARK, CLERMONT, CLINTON, COLUMBIANA, COSHOCTON, CRAWFORD, CUYAHOGA, DARKE, DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, GALLIA, GEAUGA, GREENE, GUERNSEY, HAMILTON, HARRISON, HIGHLAND, HOCKING, HOLMES, JACKSON, JEFFERSON, KNOX, LAKE, LAWRENCE, LICKING, LOGAN, LORAIN, MADISON, MAHONING, MARION, MEDINA, MEIGS, MERCER, MIAMI, MONROE, MONTGOMERY,

MORGAN, MORROW, MUSKINGUM, NOBLE,
PERRY, PICKAWAY, PIKE, PORTAGE, PREBLE,
RICHLAND, ROSS, SCIOTO, SHELBY, STARK,
SUMMIT, TRUMBULL, TUSCARAWAS,
UNION, VINTON, WARREN, WASHINGTON,
WAYNE

Special Jurisdictional Note :

Details :

Heli - Arc Welding will be paid \$.30 above Journeyman rate. Additional compensation of 10% over the Journeyman Lineman and Journeyman Technician for performing work on structures outside of buildings such as water towers, smoke stacks, radio and television towers, more than 75' above the ground.

Prevailing Wage Rate Skilled Crafts

Name of Union: Electrical Local 71 Outside Utility Power

Change # : LCN01-2019fbLoc7

Craft : Lineman Effective Date : 04/24/2019 Last Posted : 04/24/2019

	BHR	Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
		H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification											
Electrical Lineman	\$41.22	\$6.00	\$1.24	\$0.41	\$0.00	\$9.48	\$0.35	\$0.00	\$0.00	\$58.70	\$79.31
Substation Technician	\$41.22	\$6.00	\$1.24	\$0.41	\$0.00	\$9.48	\$0.35	\$0.00	\$0.00	\$58.70	\$79.31
Cable Splicer	\$43.14	\$6.00	\$1.29	\$0.43	\$0.00	\$9.92	\$0.35	\$0.00	\$0.00	\$61.13	\$82.70
Operator A	\$37.00	\$6.00	\$1.11	\$0.37	\$0.00	\$8.51	\$0.35	\$0.00	\$0.00	\$53.34	\$71.84
Operator B	\$32.78	\$6.00	\$0.98	\$0.33	\$0.00	\$7.54	\$0.35	\$0.00	\$0.00	\$47.98	\$64.37
Operator C	\$26.44	\$6.00	\$0.79	\$0.26	\$0.00	\$6.08	\$0.35	\$0.00	\$0.00	\$39.92	\$53.14
Groundman 0-12 months Exp	\$20.61	\$6.00	\$0.62	\$0.21	\$0.00	\$4.74	\$0.35	\$0.00	\$0.00	\$32.53	\$42.84
Groundman 0-12 months Exp w/CDL	\$22.67	\$6.00	\$0.68	\$0.23	\$0.00	\$5.21	\$0.35	\$0.00	\$0.00	\$35.14	\$46.48
Groundman 1 yr or more	\$22.67	\$6.00	\$0.68	\$0.23	\$0.00	\$5.21	\$0.35	\$0.00	\$0.00	\$35.14	\$46.48
Groundman 1 yr or more w/CDL	\$26.80	\$6.00	\$0.80	\$0.27	\$0.00	\$6.16	\$0.35	\$0.00	\$0.00	\$40.38	\$53.78
Equipment Mechanic A	\$32.78	\$6.00	\$0.98	\$0.33	\$0.00	\$7.54	\$0.35	\$0.00	\$0.00	\$47.98	\$64.37
Equipment Mechanic B	\$29.62	\$6.00	\$0.89	\$0.30	\$0.00	\$6.81	\$0.35	\$0.00	\$0.00	\$43.97	\$58.78
Equipment Mechanic C	\$26.44	\$6.00	\$0.79	\$0.26	\$0.00	\$6.08	\$0.35	\$0.00	\$0.00	\$39.92	\$53.14
Line Truck w/uuger	\$29.17	\$6.00	\$0.88	\$0.29	\$0.00	\$6.71	\$0.35	\$0.00	\$0.00	\$43.40	\$57.99

Apprentice	Percent											
1st 1000 hrs	60.00	\$24.73	\$6.00	\$0.74	\$0.25	\$0.00	\$5.69	\$0.35	\$0.00	\$0.00	\$37.76	\$50.13
2nd 1000 hrs	65.00	\$26.79	\$6.00	\$0.80	\$0.27	\$0.00	\$6.16	\$0.35	\$0.00	\$0.00	\$40.37	\$53.77
3rd 1000 hrs	70.00	\$28.85	\$6.00	\$0.87	\$0.29	\$0.00	\$6.64	\$0.35	\$0.00	\$0.00	\$43.00	\$57.43
4th 1000 hrs	75.00	\$30.91	\$6.00	\$0.93	\$0.31	\$0.00	\$7.11	\$0.35	\$0.00	\$0.00	\$45.62	\$61.07
5th 1000 hrs	80.00	\$32.98	\$6.00	\$0.99	\$0.33	\$0.00	\$7.59	\$0.35	\$0.00	\$0.00	\$48.24	\$64.72
6th 1000 hrs	85.00	\$35.04	\$6.00	\$1.05	\$0.35	\$0.00	\$8.06	\$0.35	\$0.00	\$0.00	\$50.85	\$68.37
7th 1000 hrs	90.00	\$37.10	\$6.00	\$1.11	\$0.37	\$0.00	\$8.53	\$0.35	\$0.00	\$0.00	\$53.46	\$72.01

Special Calculation Note : Other is Health Retirement Account

Operator "A"

John Henry Rock Drill, D-6 (or equivalent) and above, Trackhoe Digger, (320 Track excavator), Cranes (greater then 25 tons and less than 45 tons).

Operator "B"

Cranes (greater than 6 tons and up to 25 tons), Backhoes, Road Tractor, Dozer up to D-5, Pressure Digger- wheeled or tracked, all Tension wire Stringing equipment.

Operator "C"

Trench, Backhoe, Riding type vibratory Compactor, Ground Rod Driver, Boom Truck (6 ton & below), Skid Steer Loaders, Material Handler.

Ratio :

(1) Journeyman Lineman to (1) Apprentice

Jurisdiction (* denotes special jurisdictional note) :

ADAMS, ASHLAND, ASHTABULA, ATHENS, AUGLAIZE, BELMONT, BROWN, BUTLER, CARROLL, CHAMPAIGN, CLARK, CLERMONT, CLINTON, COLUMBIANA, COSHOCTON, CRAWFORD, CUYAHOGA, DARKE, DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, GALLIA, GEAUGA, GREENE, GUERNSEY, HAMILTON, HARRISON, HIGHLAND, HOCKING, HOLMES, JACKSON, JEFFERSON, KNOX, LAKE, LAWRENCE, LICKING, LOGAN, LORAIN, MADISON, MAHONING, MARION, MEDINA, MEIGS, MERCER, MIAMI, MONROE, MONTGOMERY, MORGAN, MORROW, MUSKINGUM, NOBLE, PERRY, PICKAWAY, PIKE, PORTAGE, PREBLE, RICHLAND, ROSS, SCIOTO, SHELBY, STARK, SUMMIT, TRUMBULL, TUSCARAWAS, UNION, VINTON, WARREN, WASHINGTON, WAYNE

Special Jurisdictional Note : 0.30 is for Health Retirement Account.

Details :

Heli - Arc Welding will be paid \$.30 above Journeyman rate. Additional compensation of 10% over the Journeyman Lineman and Journeyman Technician for performing work on structures outside of buildings such as water towers, smoke stacks, radio and television towers, more than 75' above the ground.

Prevailing Wage Rate Skilled Crafts

Name of Union: Electrical Local 71 Outside (North Central Ohio)

Change # : LCN01-2020fbLoc71CentralOhio

Craft : Lineman Effective Date : 11/04/2020 Last Posted : 11/04/2020

	BHR	Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
		H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification											
Electrical Lineman	\$39.23	\$6.50	\$1.18	\$0.39	\$0.00	\$7.06	\$0.06	\$0.00	\$0.00	\$54.42	\$74.04
Traffic Signal & Lighting Journeyman	\$37.73	\$6.50	\$1.13	\$0.38	\$0.00	\$6.79	\$0.06	\$0.00	\$0.00	\$52.59	\$71.45
Equipment Operator	\$34.46	\$6.50	\$1.03	\$0.34	\$0.00	\$6.20	\$0.06	\$0.00	\$0.00	\$48.59	\$65.82
Groundman 0-12 months (W/O CDL)	\$20.90	\$6.50	\$0.63	\$0.21	\$0.00	\$3.76	\$0.06	\$0.00	\$0.00	\$32.06	\$42.51
Groundman 0-12 months (W/CDL) plus	\$22.83	\$6.50	\$0.68	\$0.23	\$0.00	\$4.11	\$0.06	\$0.00	\$0.00	\$34.41	\$45.82
Groundsman greater than 1 Year (W/CDL)	\$24.77	\$6.50	\$0.74	\$0.25	\$0.00	\$4.46	\$0.06	\$0.00	\$0.00	\$36.78	\$49.17
Traffic Signal Apprentices											
1st 1,000 hours	\$22.64	\$6.50	\$0.68	\$0.23	\$0.00	\$4.08	\$0.06	\$0.00	\$0.00	\$34.19	\$45.51
2nd 1,000 hours	\$24.52	\$6.50	\$0.74	\$0.25	\$0.00	\$4.41	\$0.06	\$0.00	\$0.00	\$36.48	\$48.74
3rd 1,000 hours	\$26.41	\$6.50	\$0.79	\$0.26	\$0.00	\$4.75	\$0.06	\$0.00	\$0.00	\$38.77	\$51.98
4th 1,000 hours	\$28.30	\$6.50	\$0.85	\$0.28	\$0.00	\$5.09	\$0.06	\$0.00	\$0.00	\$41.08	\$55.23
5th 1,000 hours	\$30.18	\$6.50	\$0.91	\$0.30	\$0.00	\$5.43	\$0.06	\$0.00	\$0.00	\$43.38	\$58.47
6th 1,000 hours	\$33.96	\$6.50	\$1.02	\$0.34	\$0.00	\$6.11	\$0.06	\$0.00	\$0.00	\$47.99	\$64.97
Apprentice Lineman	Percent										

1st 1,000 Hours	60.00	\$23.54	\$6.50	\$0.71	\$0.24	\$0.00	\$4.24	\$0.06	\$0.00	\$0.00	\$35.29	\$47.06
2nd 1,000 Hours	65.00	\$25.50	\$6.50	\$0.77	\$0.26	\$0.00	\$4.59	\$0.06	\$0.00	\$0.00	\$37.68	\$50.43
3rd 1,000 Hours	70.00	\$27.46	\$6.50	\$0.82	\$0.27	\$0.00	\$4.94	\$0.06	\$0.00	\$0.00	\$40.05	\$53.78
4th 1,000 Hours	75.00	\$29.42	\$6.50	\$0.88	\$0.29	\$0.00	\$5.30	\$0.06	\$0.00	\$0.00	\$42.45	\$57.16
5th 1,000 Hours	80.00	\$31.38	\$6.50	\$0.94	\$0.31	\$0.00	\$5.65	\$0.06	\$0.00	\$0.00	\$44.84	\$60.54
6th 1,000 Hours	85.00	\$33.35	\$6.50	\$1.00	\$0.33	\$0.00	\$6.00	\$0.06	\$0.00	\$0.00	\$47.24	\$63.91
7th 1,000 Hours	90.00	\$35.31	\$6.50	\$1.06	\$0.35	\$0.00	\$6.36	\$0.06	\$0.00	\$0.00	\$49.64	\$67.29

Special Calculation Note : Other is Safety & Education Fund.

Ratio :

1 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

BELMONT, CARROLL, HARRISON, HOLMES, JEFFERSON, MEDINA, PORTAGE, STARK, SUMMIT, WAYNE

Special Jurisdictional Note :

Details :

A groundman when directed shall assist a Journeyman in the performance of his/her work on the ground, including the use of hand tools. A Groundman under no circumstances shall climb poles, towers, ladders, or work from an elevated platform or bucket truck.

No more than three (3) Groundmen shall work alone. Jobs with more than three Groundmen shall be supervised by a Groundcrew Foreman, Journeyman Lineman, Journeyman Traffic Signal Technician or an Equipment Operator.

Scope of Work: installation and maintenance of highway and street lighting, highway and street sign lighting, electronic message boards and traffic control systems, camera systems, traffic signal work, substation and line construction including overhead and underground projects for private and industrial work as in accordance with the IBEW Constitution. This Agreement includes the operation of all tools and equipment necessary for the installation of the above projects.

fiber.

Journeyman Technician I: Must know all aspects of telephone and cable work. This is to include aerial, underground, and manhole work. Must know how to climb and run bucket. Must have all the tools required to perform these tasks. Must be able to be responsible for the safety of the crew at all times. Must also have CDL license and have at least 5 years experience.

Installer/Repairman: Perform tasks of repairing, installing, and testing phone and CATV services.

Technician II: Have at least three years of telephone and CATV experience. Must have the knowledge of underground, aerial, and manhole work. Must be able to climb and operate bucket. Must have CDL. Must have all tools needed to perform these tasks.

Equipment Operator I: Able to operate a digger derrick or bucket truck. Have at least 5 years of experience and must have a valid CDL license.

Equipment Operator II: Able to operate a digger derrick or bucket truck. Have at least 3 years of experience and must have a valid CDL license.

Groundman W/CDL: Must have a valid CDL license and be able to perform tasks such as: climbing poles, pulling downguys, making up material, and getting appropriate tools for the job. Must have at least 5 year's experience.

Groundman: Perform tasks such as: climbing poles, pulling downguys, making up material, and getting appropriate tools for the job. Experience 0-5 years.

Details :

Vacation 6%/under 5 years based on regular hourly rate for all hours worked. 8%/over 5 years based on regular hourly rate for all hours worked.

Prevailing Wage Rate Skilled Crafts

Name of Union: Glazier Local 1162

Change # : LCN02-2020fbLoc1162

Craft : Glazier Effective Date : 05/14/2020 Last Posted : 05/14/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Glazier	\$27.02		\$6.78	\$6.64	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$40.79	\$54.30
Apprentice	Percent											
1st 6 months	50.00	\$13.51	\$6.78	\$6.64	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$27.28	\$34.04
2nd 6 months	55.00	\$14.86	\$6.78	\$6.64	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$28.63	\$36.06
3rd 6 months	60.00	\$16.21	\$6.78	\$6.64	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$29.98	\$38.09
4th 6 months	65.00	\$17.56	\$6.78	\$6.64	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$31.33	\$40.11
5th 6 months	70.00	\$18.91	\$6.78	\$6.64	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$32.68	\$42.14
6th 6 months	75.00	\$20.26	\$6.78	\$6.64	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$34.04	\$44.17
7th 6 months	80.00	\$21.62	\$6.78	\$6.64	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$35.39	\$46.19
8th 6 months	90.00	\$24.32	\$6.78	\$6.64	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$38.09	\$50.25

Special Calculation Note :

Ratio :

- 1 Journeyman to 1 Apprentice
- 2 Journeyman to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

- ASHLAND, CARROLL, COSHOCTON,
- HOLMES, MEDINA, PORTAGE, RICHLAND,
- STARK, SUMMIT, TUSCARAWAS, WAYNE

Special Jurisdictional Note :

Details :

Add \$1.25 per hour for High Pay which is all work that requires the employee be supported by equipment which hangs or suspends from the roof of a building or structure including all repelling .

Prevailing Wage Rate Skilled Crafts

Name of Union: Ironworker Local 550

Change # : LCR01-2020fbLoc550

Craft : Ironworker Effective Date : 05/01/2020 Last Posted : 03/17/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Ironworker	\$29.27		\$8.18	\$9.02	\$0.74	\$0.00	\$2.73	\$0.41	\$0.00	\$0.00	\$50.35	\$64.98
Apprentice	Percent											
1st 6 months	60.00	\$17.56	\$8.18	\$9.02	\$0.74	\$0.00	\$2.73	\$0.41	\$0.00	\$0.00	\$38.64	\$47.42
2nd 6 months	65.00	\$19.03	\$8.18	\$9.02	\$0.74	\$0.00	\$2.73	\$0.41	\$0.00	\$0.00	\$40.11	\$49.62
3rd 6 months	70.00	\$20.49	\$8.18	\$9.02	\$0.74	\$0.00	\$2.73	\$0.41	\$0.00	\$0.00	\$41.57	\$51.81
4th 6 months	75.00	\$21.95	\$8.18	\$9.02	\$0.74	\$0.00	\$2.73	\$0.41	\$0.00	\$0.00	\$43.03	\$54.01
5th 6 months	80.00	\$23.42	\$8.18	\$9.02	\$0.74	\$0.00	\$2.73	\$0.41	\$0.00	\$0.00	\$44.50	\$56.20
6th 6 months	85.00	\$24.88	\$8.18	\$9.02	\$0.74	\$0.00	\$2.73	\$0.41	\$0.00	\$0.00	\$45.96	\$58.40
7th 6 months	90.00	\$26.34	\$8.18	\$9.02	\$0.74	\$0.00	\$2.73	\$0.41	\$0.00	\$0.00	\$47.42	\$60.59
8th 6 months	95.00	\$27.81	\$8.18	\$9.02	\$0.74	\$0.00	\$2.73	\$0.41	\$0.00	\$0.00	\$48.89	\$62.79

Special Calculation Note : OTHER IS: JOURNEYMAN UPGRADE AND WELLNESS FUND.

Ratio :

- 4 Journeymen to 1 Apprentice
- 1 Journeymen to 1 Apprentice, spinning of cable for suspension bridge
- 1 Journeymen to 1 Apprentice, ornamental work
- 2 Journeymen to 1 Apprentice, reinforcing work
- 1 Journeymen to 2 Apprentice, roadway

Jurisdiction (* denotes special jurisdictional note) :

- ASHLAND, CARROLL, COLUMBIANA*,
- COSHOCTON, HOLMES*, HURON,
- MAHONING*, MEDINA*, PORTAGE*,
- RICHLAND, STARK, SUMMIT*,
- TUSCARAWAS, WAYNE

Special Jurisdictional Note : The jurisdictional line between Local 17 and Local 550 is determined as follows: All territory North of Old Route 224 line to be within the jurisdiction of Local 17. All territory South of Old Route 224 line is to be the jurisdiction of Local 550, except for everything within the City limits of Barberton which shall be under the jurisdiction of Local

17.

Details :

Special Jurisdictional Note : The jurisdictional line between Locals 17 and 550 is determined as follows: All territory North of Old Route 224 line is to be within the jurisdiction of Local 17.
All territory South of Old Route 224 line is to be the jurisdiction of Local 550, except for everything within the City limits of Barberton which shall be under the jurisdiction of Local 17.

Details :

Prevailing Wage Rate Skilled Crafts

Name of Union: Labor HevHwy 2

Change # : LCN01-2020fbLaborHevHwy2

Craft : Laborer Group 1 Effective Date : 05/14/2020 Last Posted : 05/14/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Laborer Group 1	\$33.05		\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$44.40	\$60.92
Group 2	\$33.22		\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$44.57	\$61.18
Group 3	\$33.55		\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$44.90	\$61.67
Group 4	\$34.00		\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$45.35	\$62.35
Watch Person	\$25.35		\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$36.70	\$49.38
Apprentice	Percent											
0-1000 hrs	60.00	\$19.83	\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$31.18	\$41.10
1001-2000 hrs	70.02	\$23.14	\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$34.49	\$46.06
2001-3000 hrs	80.00	\$26.44	\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$37.79	\$51.01
3001-4000 hrs	90.00	\$29.74	\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$41.10	\$55.97
More Than 4000 hrs	100.00	\$33.05	\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$44.40	\$60.92

Special Calculation Note : Watchman has no Apprentices. Tunnel Laborer rate with air-pressurized add \$1.00 to the above wage rate.

Ratio :

- 1 Journeymen to 1 Apprentice
- 3 Journeymen to 1 Apprentice thereafter

Jurisdiction (* denotes special jurisdictional note) :

- ASHTABULA, ERIE, HURON, LORAIN,
- LUCAS, MAHONING, MEDINA, OTTAWA,
- PORTAGE, SANDUSKY, STARK, SUMMIT,
- TRUMBULL, WOOD

Special Jurisdictional Note : Hod Carriers and Common Laborers - Heavy, Highway, Sewer, Waterworks, Utility, Airport, Railroad, Industrial and Building Site, Sewer Plant, Waste Water Treatment Facilities Construction

Details :

Group 1

Laborer (Construction); Plant Laborer or Yardman, Right-of-way Laborer, Landscape Laborer, Highway Lighting Worker, Signalization Worker, (Swimming) Pool Construction Laborer, Utility Man, *Bridge Man, Handyman, Joint Setter, Flagperson, Carpenter Helper, Waterproofing Laborer, Slurry Seal, Seal Coating, Surface Treatment or Road Mix Laborer, Riprap Laborer & Grouter, Asphalt Laborer, Dump Man (batch trucks), Guardrail & Fence Installer, Mesh Handler & Placer, Concrete Curing Applicator, Scaffold Erector, Sign Installer, Hazardous Waste (level D), Diver Helper, Zone Person and Traffic Control.

*Bridge Man will perform work as per the October 31, 1949, memorandum on concrete forms, by and between the United Brotherhood of Carpenters and Joiners of America and the Laborers' International Union of North America, which states in; "the moving, cleaning, oiling and carrying to the next point of erection, and the stripping of forms which are not to be re-used, and forms on all flat arch work shall be done by members of the Laborers' International Union of North America."

Group 2

Asphalt Raker, Screwman or Paver, Concrete Puddler, Kettle Man (pipeline), All Machine-Driven Tools (Gas, Electric, Air), Mason Tender, Brick Paver, Mortar Mixer, Skid Steer, Sheeting & Shoring Person, Surface Grinder Person, Screedperson, Water Blast, Hand Held Wand, Power Buggy or Power Wheelbarrow, Paint Striper, Plastic fusing Machine Operator, Rodding Machine Operator, Pug Mill Operator, Operator of All Vacuum Devices Wet or Dry, Handling of all Pumps 4 inches and under (gas, air or electric), Diver, Form Setter, Bottom Person, Welder Helper (pipeline), Concrete Saw Person, Cutting with Burning Torch, Pipe Layer, Hand Spiker (railroad), Underground Person (working in sewer and waterline, cleaning, repairing and reconditioning). Tunnel Laborer (without air), Caisson, Cofferdam (below 25 feet deep), Air Track and Wagon Drill, Sandblaster Nozzle Person, Hazardous Waste (level B), ***Lead Abatement, Hazardous Waste (level C)

***Includes the erecting of structures for the removal, including the encapsulation and containment of Lead abatement process.

Group 3

Blast and Powder Person, Muckers will be defined as shovel men working directly with the miners, Wrencher (mechanical joints & utility pipeline), Yarnier, Top Lander, Hazardous Waste (level A), Concrete Specialist, Curb Setter and Cutter, Grade Checker, Concrete Crew in Tunnels. Utility pipeline Tappers, Waterline, Caulker, Signal Person will receive the rate equal to the rate paid the Laborer classification for which the Laborer is signaling.

Group 4

Miner, Welder, Gunitite Nozzle Person

A.) The Watchperson shall be responsible to patrol and maintain a safe traffic zone including but not limited to barrels, cones, signs, arrow boards, message boards etc.

The responsibility of a watchperson is to see that the equipment, job and office trailer etc. are secure.

Prevailing Wage Rate Skilled Crafts

Name of Union: Labor Local 1015 Building

Change # : LCN01-2020fbLoc1015

Craft : Laborer Effective Date : 08/20/2020 Last Posted : 08/20/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Laborer Group 1	\$29.02		\$7.00	\$3.80	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$40.32	\$54.83
Group 2	\$29.42		\$7.00	\$3.80	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$40.72	\$55.43
Group 3	\$29.77		\$7.00	\$3.80	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$41.07	\$55.96
Group 4	\$29.72		\$7.00	\$3.80	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$41.02	\$55.88
Group 5	\$22.06		\$7.00	\$3.80	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$33.36	\$44.39
Apprentice	Percent											
0-1000 hrs	60.00	\$17.41	\$7.00	\$3.80	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$28.71	\$37.42
1001-2000 hrs	70.00	\$20.31	\$7.00	\$3.80	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$31.61	\$41.77
2001-3000 hrs	80.00	\$23.22	\$7.00	\$3.80	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$34.52	\$46.12
3001-4000 hrs	90.00	\$26.12	\$7.00	\$3.80	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$37.42	\$50.48
More than 4000 hrs	100.00	\$29.02	\$7.00	\$3.80	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$40.32	\$54.83

Special Calculation Note : No special calculations for this skilled craft wage rate are required at this time.

Ratio :

1 Journeyman to 1 Apprentice
4 Journeyman to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

CARROLL, STARK, WAYNE

Special Jurisdictional Note :

Details :

Group 1

Building & Construction Laborer, Signalman, Flagman, Tool Cribman, Carpenter Tender, Finisher Tender, Concrete Handler, Utility Construction Laborer, Guard Rail Erectors, Hazardous Waste (Level D)

Group 2

Bottom Man, Scaffold Builder, Tunnel laborer, Pipe Layer, Air and Power Driven Tools, Burner on Demolition Work, Swinging Scaffold, Mucker, Caisson Worker, Cofferdam Worker, Powder Men and Dynamite Blaster, Creosote Worker, Form Setter, Plasterer Tender, Hod Carrier Laser Beam Set-up Man, All confined space work, furnaces, pickel tubs, acid-pits, and Hazardous Waste Level (C)

Group 3

Mason Tender, Mortar Mixer, Stonemason Tender, skid-loader, Hazardous Waste Level (B)

Group 4

Gunnite Operator, Hazardous Waste Level (A)

Group 5

Watchman

Prevailing Wage Rate Skilled Crafts

Name of Union: Operating Engineers - Building Local 18 - Zone III

Change # : LCN01-2020fbLoc18zone3

Craft : Operating Engineer Effective Date : 05/14/2020 Last Posted : 05/14/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Operator Class 1	\$38.24	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$53.69	\$72.81	
Class 2	\$38.12	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$53.57	\$72.63	
Class 3	\$37.08	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$52.53	\$71.07	
Class 4	\$35.90	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$51.35	\$69.30	
Class 5	\$30.44	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$45.89	\$61.11	
Class 6	\$38.49	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$53.94	\$73.18	
Class 7	\$38.74	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$54.19	\$73.56	
Class 8	\$39.24	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$54.69	\$74.31	
Class 9	\$39.49	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$54.94	\$74.68	
Apprentice	Percent											
1st Year	50.00	\$19.12	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$34.57	\$44.13
2nd Year	60.00	\$22.94	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$38.39	\$49.87
3rd Year	70.00	\$26.77	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$42.22	\$55.60
4th Year	80.00	\$30.59	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$46.04	\$61.34
Field Mechanic Trainee												
1st Year	50.00	\$19.12	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$34.57	\$44.13
2nd Year	60.00	\$22.94	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$38.39	\$49.87
3rd Year	70.00	\$26.77	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$42.22	\$55.60
4th Year	80.00	\$30.59	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$46.04	\$61.34

Special Calculation Note : Other: Education & Safety \$0.09

Ratio :

For every (3) Operating Engineer Journeymen employed by the company there may be employed (1) Registered Apprentice or trainee Engineer through the referral when they are available. An apprentice, while employed as part of a crew per

Jurisdiction (* denotes special jurisdictional note) :

ADAMS, ALLEN, ASHLAND, ATHENS, AUGLAIZE, BELMONT, BROWN, BUTLER, CARROLL, CHAMPAIGN, CLARK, CLERMONT, CLINTON, COSHOCTON, CRAWFORD, DARKE, DEFIANCE,

Article VIII, paragraph 77, will not be subject to the apprenticeship ratios in this collective bargaining agreement

DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, FULTON, GALLIA, GREENE, GUERNSEY, HAMILTON, HANCOCK, HARDIN, HARRISON, HENRY, HIGHLAND, HOCKING, HOLMES, JACKSON, JEFFERSON, KNOX, LAWRENCE, LICKING, LOGAN, MADISON, MARION, MEIGS, MERCER, MIAMI, MONROE, MONTGOMERY, MORGAN, MORROW, MUSKINGUM, NOBLE, OTTAWA, PAULDING, PERRY, PICKAWAY, PIKE, PREBLE, PUTNAM, RICHLAND, ROSS, SANDUSKY, SCIOTO, SENECA, SHELBY, STARK, TUSCARAWAS, UNION, VAN WERT, VINTON, WARREN, WASHINGTON, WAYNE, WILLIAMS, WYANDOT

Special Jurisdictional Note :

Details :

**Apprentices will receive a 10% increase on top of the percentages listed above provided they are operating mobile equipment. Mechanic Trainees will receive 10% increase if required to have CDL

Class 1 - Barrier Moving Machine; Boiler Operators or Compressor Operators, when compressor or boiler is mounted on crane (Piggyback Operation); Boom Trucks (all types); Cableways Cherry Pickers; Combination - Concrete Mixers & Towers; All Concrete Pumps with Booms; Cranes (all types) Derricks (all types); Draglines Dredges (dipper, clam or suction) 3-man crew; Elevating Graders or Euclid Loaders; Floating Equipment; Gradalls; Helicopter Operators; hoisting building materials; Helicopter Winch Operators, Hoisting building materials; Hoes (All types); Hoists (with two or more drums in use); Hydraulic Gantry (lift system); Laser Finishing Machines; Lift Slab or Panel Jack Operators; Locomotives (all types); Maintenance Engineers (Mechanic and/or Welder); Mixers, paving (multiple drum); Mobile Concrete Pumps, with booms, Panelboards, (all types on site); Pile Drivers; Power Shovels; Prentice Loader; Rail Tamper (with automatic lifting and aligning device); Rotary Drills (all used on caissons for foundations and sub-structure work; Side Booms; Slip Form Pavers; Straddle Carriers (Building Construction on site); Tug Boats. Horizontal Directional Drill, Rough Terrain Fork-lift with Winch/Hoist, Laser Screed, and Like equipment; Compact Cranes, track or rubber over 4,000 pound capacity, self-erecting cranes: stationary, track or truck (all configurations) bucket trench machines (over 24 " wide).

Class 2 - Asphalt Pavers; Bobcat-type and/or skid steer loader with hoe attachment greater than 7000 lbs. Bulldozers; CMI type Equipment; Endloaders; Hydro Milling Machine; Kolman-type Loaders (Dirt Loading); Lead Greasemen; Mucking Machines; Pettibone-Rail Equipment; Power Graders; Power Scoops; Power Scrapers; Push Cats; Vermeer Type Concrete Saw; All rotomills, grinders & planers of all types. Articulating/end dumps (minus \$4.00/hour from Class 2 rate)

Class 3 - A Frames; Air Compressors, Pressurizing Shafts or Tunnels; All Asphalt Rollers; Bobcat-type and/or skid steer loader with or without attachments; Boilers (15 lbs pressure and over); All concrete Pumps (without booms with 5 inch system); Fork Lifts (except masonry); Highway Drillers - all types (with integral power); Hoists (with one drum); House Elevators (except those automatic call button controlled); Man lifts; Mud Jacks; Pressure Grouting; Pump Operators (installing or operating Well

Points or other types of Dewatering Systems); Pumps (4 inches and over discharge); Railroad Tie Inserter/Remover; Rotator (Lime-Soil Stabilizer); Submersible Pumps (4 inches and over discharge); Switch & Tie Tampers (without lifting and aligning device); Trench Machines (24 inches and under); Utility Operators; Material hoist/elevators.

Class 4 - Ballast Re-locator; Backfillers and Tampers; Batch Plant Operators; Bar and Joint Installing Machines; Bull Floats; Burlap and Curing Machines; Clefplanes; Compressors, on building construction; Concrete Spreader; Conveyors, used for handling building materials; Concrete Mixers, one bag capacity (side loader); Concrete Mixers, capacity more than one bag; Crushers; Deck Hands; Drum Fireman (in Asphalt Plant); Farm type tractors pulling attachments; Finishing Machines; Form Trenchers; Generators; Guniting Machines; Hydro-Seeders; Pavement Breakers (hydraulic or cable); Post Drivers; Post Hole Diggers; Pressure Pumps (over 1/2 inch discharge); Road Widening Trenchers; Rollers (except asphalt); All Concrete pumps (without Boom with 4 inch or smaller systems); Self-Propelled Power Spreaders; Concrete Spreaders; Self-Propelled Sub-graders; Shotcrete Machines; Tire Repairmen; Tractors, pulling sheepfoot rollers or graders; VAC/ALLS; Vibratory Compactors, with integral power; Welder Operators.

Class 5 - Boilers (less than 15 lbs. pressure); Inboard/outboard Motor Boat Launches; Light Plant Operators; Masonry Fork Lifts; Oilers/Helpers; Power Driven Heaters (oil fired); Power Scrubbers; Power Sweepers; Pumps (under 4 inch discharge); Signalmen, Submersible Pumps (under 4 inch discharge). Directional Drill Locator and Allen Screed Concrete Paver. Fueling and greasing (Primary Operator with Specialized CDL Endorsement Add \$3.00/ hour), compact cranes; track or rubber under 4,000 pounds.

Class 6 - Master Mechanic

Class 7 - Boom & Jib 150 - 180 feet

Class 8 - Boom & Jib 180 - 249 feet

Class 9 - Boom & Jib 250 - or over

Prevailing Wage Rate Skilled Crafts

Name of Union: Operating Engineers - HevHwy Zone II

Change # : LCN01-2020fbLoc18hevhwyl

Craft : Operating Engineer Effective Date : 05/14/2020 Last Posted : 05/14/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)		
Classification											
Operator Class 1	\$38.24	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$53.69	\$72.81
Class 2	\$38.12	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$53.57	\$72.63
Class 3	\$37.08	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$52.53	\$71.07
Class 4	\$35.90	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$51.35	\$69.30
Class 5	\$30.44	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$45.89	\$61.11
Class 6	\$38.49	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$53.94	\$73.18
Apprentice	Percent										
1st Year	50.00	\$19.12	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$34.57	\$44.13
2nd Year	60.00	\$22.94	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$38.39	\$49.87
3rd Year	70.00	\$26.77	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$42.22	\$55.60
4th Year	80.00	\$30.59	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$46.04	\$61.34
Field Mech Trainee Class 2											
1st year	49.85	\$19.06	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$34.51	\$44.04
2nd year	59.80	\$22.87	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$38.32	\$49.75
3rd year	69.77	\$26.68	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$42.13	\$55.47
4th year	79.75	\$30.50	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$45.95	\$61.19

Special Calculation Note : Other: Education & Safety Fund is \$0.09 per hour.

Ratio :

For every (3) Operating Engineer Journeymen employed by the company , there may be employed (1) Registered Apprentice or Trainee Engineer through the referral when they are available. An apprentice, while employed as part of a crew per Article VIII paragraph 65, will not be subject the apprenticeship ratios in this collective bargaining agreement.

Jurisdiction (* denotes special jurisdictional note) :

ADAMS, ALLEN, ASHLAND, ATHENS, AUGLAIZE, BELMONT, BROWN, BUTLER, CARROLL, CHAMPAIGN, CLARK, CLERMONT, CLINTON, COSHOCTON, CRAWFORD, DARKE, DEFIANCE, DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, FULTON, GALLIA, GREENE, GUERNSEY, HAMILTON, HANCOCK, HARDIN, HARRISON, HENRY, HIGHLAND, HOCKING,

HOLMES, HURON, JACKSON, JEFFERSON,
KNOX, LAWRENCE, LICKING, LOGAN,
LUCAS, MADISON, MARION, MEIGS,
MERCER, MIAMI, MONROE, MONTGOMERY,
MORGAN, MORROW, MUSKINGUM, NOBLE,
OTTAWA, PAULDING, PERRY, PICKAWAY,
PIKE, PREBLE, PUTNAM, RICHLAND, ROSS,
SANDUSKY, SCIOTO, SENECA, SHELBY,
STARK, TUSCARAWAS, UNION, VAN WERT,
VINTON, WARREN, WASHINGTON, WAYNE,
WILLIAMS, WOOD, WYANDOT

Special Jurisdictional Note :

Details :

****Apprentices will receive a 10% increase on top of the percentages listed above provided they are operating mobile equipment. Mechanic Trainees will receive 10% increase if they are required to have CDL.**

Class 1 - Air Compressors on Steel Erection; Barrier Moving Machine; Boiler Operators, on Compressors or Generators, when mounted on a rig: Cableways, Combination Concrete mixers & Towers; Concrete Pumps; Concrete Plants (over 4 yd capacity); Cranes (all types, including Boom Trucks, Cherry Pickers); Derricks; Draglines, Dredgers (dipper, clam or suction); Elevating Graders or Euclid Loaders; Floating Equipment (all types); Gradalls, Helicopter Crew (Operator- hoist or winch); Hoes (all types); Hoisting Engines, on shaft or tunnel work; Hydraulic Gantry (lifting system); Industrial - Type Tractors; Jet Engine Dryers (D8 or D9), Diesel Tractors; Locomotives (standard gage); Maintenance Operators (class A); Mixers, paving (single or double drum); Mucking Machines; Multiple Scrapers; Piledriving Machines (all types); Power Shovels, Prentice Loader; Quad 9 (double pusher); Rail Tamper (with automatic lifting and aligning device); Refrigerating Machines (freezer operation); Side Booms; Slip Form Pavers; Tower Dericks; Tree Shredders; Truck Mounted Concrete Pumps; Tug Boats; Tunnel Machines and /or Mining Machines; Wheel Excavators. Rough Terrain Fork-lift with Winch/Hoist; Compact Cranes, track rubber over 4,000 pound capacity, self-erecting cranes; stationary, track or truck (all configurations) Bucket trench machines (over 24 inches wide).

Class 2 - Asphalt Pavers; Automatic Subgrade Machines, self-propelled (CMI-type); Bobcat-type and /or skid steer loader with hoe attachment greater than 7000 lbs.; Boring Machine Operators (more than 48 inches); Bulldozers; Endloaders; Hydro Milling Machine; Kolman-type Loaders (production type-dirt); Lead Greasemen; Maintenance Operators, Class B (Portage and Summit Counties only); Pettibone-Rail Equipment; Power Graders; Power Scrapers; Push Cats; Lighting and Traffic Signal Installation Equipment includes all groups or classifications; Trench Machines (24inch wide and under); Vermeer Type Concrete saw. Material Transfer Equipment (Shuttle buggy) Asphalt; All rotomills,grinders and planers of all types. Horizontal Directional Drill (Over 50,000 ft.lbs.thrust and over)

Class 3 - A-Frames; Air Compressors, on tunnel work (low Pressure); Asphalt Plant Engineers; Bobcat-type and/or skid steer loader with or without attachments; Power Boilers (15 lbs pressure and over); Highway Drills (all types); Rollers, asphalt; Pump Operators (installing or operating well Points); Pumps (4 inch and over discharge); Railroad Tie Inserter/Remover; Rotator (lime-soil Stabilizer), Switch & Tie Tampers (without lifting and aligning device); Locomotives (narrow gage); Mixers, concrete (more than one bag capacity); Mixers, one bag capacity (side loader); Utilities Operators, (small equipment);

Welding Machines; Material hoist/elevators. Articulating/straight bed end dumps if assigned (minus \$4.00 per hour).

Class 4 -Ballast Re-locator; Backfillers, Batch Plants; Bar and Joint Installing Machines; Boring Machine Operators (48 inch or less); Bull Floats; Burlap and Curing Machines; Concrete Plants (capacity 4 yd and under); Conveyors (highway); Concrete Saws (multiple); Crushers; Deckhands; Farm type tractors, with attachments (highway), except masonry; Finishing Machines; Firemen, Floating Equipment (all types); Fork Lifts (highway); Form Trenchers; Hydro Hammers; Hydro Seeders; Pavement Breakers; Plant Mixers; Post Drivers; Post Hole Diggers (power auger); Power Brush Burners; Power Form Handling Equipment; Road Widening Trenchers; Rollers (brick, grade, macadam); Self-Propelled Power Spreaders; Self-Propelled Sub-Graders; Tractors, pulling sheepsfoot rollers or graders; Steam Firemen; Vibratory Compactors, with integral power.

Class 5 - Compressors (portable, Sewer, Heavy and Highway); Generators; Inboard-Outboard Motor Boat Launches; Masonry Fork Lifts; Oilers/Helpers; Power Driven Heaters; Power Scrubbers; Power Sweepers; Pumps (under 4 inch discharge); Signalmen; Drum Fireman (in Asphalt Plant); Oil Heaters (Asphalt Plant); Tire Repairmen; VAC/ALLS; Fueling and greasing (Primary Operator with Specialized CDL Endorsement Add \$3.00/ hour), compact cranes: track or rubber under 4,000 pounds.

Class 6 - Master Mechanic

Prevailing Wage Rate Skilled Crafts

Name of Union: Painter Local 841 Zone II

Change # : LCN01-2019fbLoc603Com.

Craft : Painter Effective Date : 10/09/2019 Last Posted : 10/09/2019

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Painter Brush Roll	\$24.70		\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$38.88	\$51.23
Paperhanger	\$24.70		\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$38.88	\$51.23
Spray Gun Operator of Any & All Coatings	\$25.55		\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$39.73	\$52.51
Swing Scaffold, Bosum Chair & Window Jack	\$25.45		\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$39.63	\$52.35
Sandblast, Painting of Standpipes, Etc. from Scaffolds, Open Structural Steel, Standpipes & Water Towers	\$25.95		\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$40.13	\$53.10
Epoxy Applications	\$25.35		\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$39.53	\$52.21
Synthetic Applications	\$25.95		\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$40.13	\$53.10
Lead Abatement	\$25.95		\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$40.13	\$53.10
Asbestos Removal	\$25.95		\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$40.13	\$53.10
Apprentice	Percent											
1st 6 months	50.00	\$12.35	\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$26.53	\$32.71

2nd 6 months	55.00	\$13.59	\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$27.76	\$34.56
3rd 6 months	60.00	\$14.82	\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$29.00	\$36.41
4th 6 months	65.00	\$16.05	\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$30.23	\$38.26
5th 6 months	70.00	\$17.29	\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$31.47	\$40.12
6th 6 months	75.00	\$18.52	\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$32.71	\$41.97
7th 6 months	80.00	\$19.76	\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$33.94	\$43.82
8th 6 months	90.00	\$22.23	\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$36.41	\$47.53

Special Calculation Note : Apprentice pay based on percentage of above appropriate classification.

Ratio :

3 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

CARROLL, COSHOCTON, HOLMES, STARK, TUSCARAWAS, WAYNE

Special Jurisdictional Note :

Details :

Commercial and industrial work, performed outside the regular work day, the rate of pay shall be \$2.00 per hour above the applicable wage scale. This rate of pay is only applicable for eight – (8) hours. Additional hours shall be paid at the rate of time and one – half.

Prevailing Wage Rate Skilled Crafts

Name of Union: Painter Local 841 Zone II

Change # : LCN01-2019fbLoc603Com.

Craft : Drywall Finisher Effective Date : 10/09/2019 Last Posted : 10/09/2019

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Painter Drywall Finisher	\$25.95		\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$40.13	\$53.10
Drywall Taping	\$25.95		\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$40.13	\$53.10
Drywall Finisher W/Machines	\$25.95		\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$40.13	\$53.10
Apprentice	Percent											
1st 6 months	50.00	\$12.98	\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$27.16	\$33.64
2nd 6 months	55.00	\$14.27	\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$28.45	\$35.59
3rd 6 months	60.00	\$15.57	\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$29.75	\$37.53
4rd 6 months	70.00	\$18.16	\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$32.35	\$41.43
5th 6 months	80.00	\$20.76	\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$34.94	\$45.32
6th 6 months	90.00	\$23.35	\$6.66	\$7.17	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$37.54	\$49.21

Special Calculation Note : Apprentice pay based on percentage of above appropriate classification.

Ratio :

3 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

CARROLL, COSHOCTON, HOLMES, STARK, TUSCARAWAS, WAYNE

Special Jurisdictional Note :

Details :

Commercial and industrial work, performed outside the regular work day, the rate of pay shall be \$2.00

per hour above the applicable wage scale. This rate of pay is only applicable for eight – (8) hours. Additional hours shall be paid at the rate of time and one – half.

8th 6 Months	90.00	\$19.86	\$6.16	\$6.37	\$0.35	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$32.74	\$42.67

Special Calculation Note : Apprentice pay based on percentage of above classification.

Ratio :
3 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :
CARROLL, COSHOCTON, HOLMES, STARK,
TUSCARAWAS, WAYNE

Special Jurisdictional Note :

Details :

Commercial and industrial work, performed outside the regular work day, the rate of pay shall be \$2.00 per hour above the applicable wage scale. This rate of pay is only applicable for eight – (8) hours. Additional hours shall be paid at the rate of time and one – half.

VAN WERT, VINTON, WARREN, WASHINGTON,
WAYNE, WILLIAMS, WOOD, WYANDOT

Special Jurisdictional Note :

Details :

Top Helper: Shall perform the responsibilities of a Helper and be responsible for the setup, break down, safety and quality of the company's product.

Helper : Shall be responsible for performing tasks in refinishing, compliance with safety procedures, setting up and breaking down job sites, scaffolding and swing stages and preparing surfaces for refinishing including but not limited to, masking and stripping and cleaning, oxidizing, polishing and scratch removal on various surfaces

Class A Workers: Less than 1 Year of Service.

Class B Workers: More than 1 and less than 8 Years of Service.

Class C Workers: More than 8 Years of Service.

Metal Polisher Scope of Work: Polishing, buffing, stripping, coloring, lacquering, spraying, cleaning and maintenance of ornamental and architectural metals, iron, bronze, nickel, aluminum and stainless steel and in mental specialty work, various stone finishes, stone specialty work and any other work pertaining to the finishing of metal, stones, woods, and any window washing/cleaning done in conjunction with this work, using chemicals, solvents, coatings and hand applied lacquer thinner, removing scratches from mirror finished metals, burnishing of bronze, statuary finishes on exterior and interior surfaces and the use of all tools required to perform such work, including but not limited to polishes, spray equipment and scaffolding.

Swing State Rate: All work on scaffold 4 sections or higher, including any boom lifts and swing stage scaffolds including the rigging and derigging of hanging/suspended swing stage systems and rappelling/bolson chair work, ADD \$1.50 per hour.

4000 hrs 50% plus (\$4.46 h&w)+(\$1.00 pension)+(\$0.25 apprentice training) + vacation \$0.37
5000 hrs 70% plus (\$4.46 h&w)+(\$1.00 pension)+(\$0.25 apprentice training) + vacation \$0.37
6000 hrs 85% plus (\$4.46 h&w)+(\$1.00 pension)+(\$0.25 apprentice training) + vacation \$0.37
7000 hrs 90% plus (\$4.46 h&w)+(\$1.00 pension)+(\$0.25 apprentice training) + vacation \$0.37

Ratio :

Jurisdiction (* denotes special jurisdictional note) :

ASHLAND, ASHTABULA, CUYAHOGA, ERIE,
GEAUGA, LAKE, LORAIN, MEDINA,
PORTAGE, RICHLAND, STARK, SUMMIT

Special Jurisdictional Note :

Details :

Sign and display work shall include but not limited: to the making and installation of all signs and servicing of the same, lettering and pictorial work of any kind, including vinyl signs and vinyl substrates and the preparing for the finishing of same, be it by hand, brush, roller, spray, mechanical or computer aided and by any other method or process pertaining to same: they shall have control of all branches, methods and processes of screen process work: tube bending and display work such as creating, building and finishing of all display matter and its related operations used for advertising purposes, including all lettering whether it be done by hand, mechanical or computer aided or by any other method or process pertaining to same: the construction, erection and maintenance of all billboards and all communication advertising.

Prevailing Wage Rate Skilled Crafts

Name of Union: Painter Local 639 Zone 2 Sign

Change # : LCN01-2016fbLoc639

Craft : Painter Effective Date : 08/03/2016 Last Posted : 08/03/2016

	BHR	Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
		H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification											
Painter Sign Journeyman Tech/Team Leader Class A	\$21.25	\$1.33	\$0.14	\$0.00	\$0.00	\$0.00	\$0.57	\$0.00	\$0.00	\$23.29	\$33.92
Painter Sign Journeyman Tech/Team Leader Class B	\$21.25	\$1.33	\$0.14	\$0.00	\$0.41	\$0.00	\$0.57	\$0.00	\$0.00	\$23.70	\$34.32
Painter Sign Journeyman Tech/Team Leader Class C	\$21.25	\$1.33	\$0.14	\$0.00	\$0.82	\$0.00	\$0.57	\$0.00	\$0.00	\$24.11	\$34.74
Painter Sign Journeyman Tech/Team Leader Class D	\$21.25	\$1.33	\$0.14	\$0.00	\$1.23	\$0.00	\$0.57	\$0.00	\$0.00	\$24.52	\$35.14
Sign Journeyman Class A	\$20.98	\$1.33	\$0.14	\$0.00	\$0.00	\$0.00	\$0.56	\$0.00	\$0.00	\$23.01	\$33.50
Sign Journeyman Class B	\$20.98	\$1.33	\$0.14	\$0.00	\$0.40	\$0.00	\$0.56	\$0.00	\$0.00	\$23.41	\$33.90
Sign Journeyman Class C	\$20.98	\$1.33	\$0.14	\$0.00	\$0.81	\$0.00	\$0.56	\$0.00	\$0.00	\$23.82	\$34.31
Sign Journeyman Class D	\$20.98	\$1.33	\$0.14	\$0.00	\$1.21	\$0.00	\$0.56	\$0.00	\$0.00	\$24.22	\$34.71
Tech Sign Fabrication/ Erector Class A	\$15.90	\$1.33	\$0.14	\$0.00	\$0.00	\$0.00	\$0.43	\$0.00	\$0.00	\$17.80	\$25.75
Tech Sign Fabrication/ Erector Class B	\$15.90	\$1.33	\$0.14	\$0.00	\$0.31	\$0.00	\$0.43	\$0.00	\$0.00	\$18.11	\$26.06
Tech Sign Fabrication/ Erector Class C	\$15.90	\$1.33	\$0.14	\$0.00	\$0.61	\$0.00	\$0.43	\$0.00	\$0.00	\$18.41	\$26.36
Tech Sign Fabrication/ Erector	\$15.90	\$1.33	\$0.14	\$0.00	\$0.92	\$0.00	\$0.43	\$0.00	\$0.00	\$18.72	\$26.67

MERCER, MONROE, MORROW, NOBLE,
OTTAWA, PAULDING, PIKE, PORTAGE,
PUTNAM, RICHLAND, SANDUSKY, SENECA,
SHELBY, STARK, SUMMIT, TRUMBULL,
TUSCARAWAS, VAN WERT, WASHINGTON,
WAYNE, WILLIAMS, WOOD, WYANDOT

Special Jurisdictional Note :

Details :

3 Journeymen to 1 Apprentice

CARROLL, COSHOCTON, HOLMES, KNOX,
STARK, TUSCARAWAS, WAYNE

Special Jurisdictional Note :

Details :

Prevailing Wage Rate Skilled Crafts

Name of Union: Plumber Pipefitter Local 94

Change # : LCN01-2020fbLoc94

Craft : Plumber/Pipefitter Effective Date : 06/04/2020 Last Posted : 06/04/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Plumber Pipefitter	\$35.78		\$8.58	\$5.94	\$0.77	\$0.00	\$6.05	\$0.19	\$0.00	\$0.00	\$57.31	\$75.20
Apprentice Hired After 05-01-2017												
1st Year	\$14.31		\$8.58	\$0.00	\$0.77	\$0.00	\$3.03	\$0.19	\$0.00	\$0.00	\$26.88	\$34.03
2nd Year	\$17.89		\$8.58	\$0.50	\$0.77	\$0.00	\$3.03	\$0.19	\$0.00	\$0.00	\$30.96	\$39.91
3rd Year	\$21.47		\$8.58	\$0.50	\$0.77	\$0.00	\$2.69	\$0.19	\$0.00	\$0.00	\$34.20	\$44.93
4th Year	\$25.05		\$8.58	\$0.74	\$0.77	\$0.00	\$4.23	\$0.19	\$0.00	\$0.00	\$39.56	\$52.09
5th Year	\$28.62		\$8.58	\$0.75	\$0.77	\$0.00	\$4.23	\$0.19	\$0.00	\$0.00	\$43.14	\$57.45
Apprentice If Hired Before 5-01-2017	Percent											
5th 6 months	60.00	\$21.47	\$8.58	\$0.50	\$0.77	\$0.00	\$1.79	\$0.19	\$0.00	\$0.00	\$33.30	\$44.03
6th 6 months	65.00	\$23.26	\$8.58	\$0.50	\$0.77	\$0.00	\$1.79	\$0.19	\$0.00	\$0.00	\$35.09	\$46.72
7th 6 months	75.00	\$26.83	\$8.58	\$0.50	\$0.77	\$0.00	\$1.79	\$0.19	\$0.00	\$0.00	\$38.67	\$52.08
8th 6 months	80.00	\$28.62	\$8.58	\$0.50	\$0.77	\$0.00	\$1.79	\$0.19	\$0.00	\$0.00	\$40.45	\$54.77
9th 6 months	85.00	\$30.41	\$8.58	\$0.50	\$0.77	\$0.00	\$1.79	\$0.19	\$0.00	\$0.00	\$42.24	\$57.45
10th 6 monthsr	90.00	\$32.20	\$8.58	\$0.50	\$0.77	\$0.00	\$1.79	\$0.19	\$0.00	\$0.00	\$44.03	\$60.13

Special Calculation Note : Other is Industry and International Training Fund.

Ratio :

- 1 Journeymen to 2 Apprentice
- 4 Journeymen to 3 Apprentice
- 6 Journeymen to 4 Apprentice
- 9 Journeymen to 5 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

CARROLL*, STARK, WAYNE

3 Journeyman to 1 Apprentice Thereafter

Special Jurisdictional Note : In Carroll County the following townships are included: Ross, Monroe, Union, Lee, Orange, Perry and London.

Details :

Prevailing Wage Rate Skilled Crafts

Name of Union: Plumber Pipefitter Local 94

Change # : LCN01-2019fbLoc94

Craft : Plumber/Pipefitter Effective Date : 11/26/2019 Last Posted : 11/26/2019

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Plumber Pipefitter	\$35.78		\$8.08	\$5.59	\$0.72	\$0.00	\$5.65	\$0.19	\$0.00	\$0.00	\$56.01	\$73.90
Apprentice Hired Before 05-01-2017												
3 rd 6 months	\$17.89		\$8.08	\$0.50	\$0.72	\$0.00	\$1.79	\$0.19	\$0.00	\$0.00	\$29.17	\$38.11
4th 6 Months	\$19.68		\$8.08	\$0.50	\$0.72	\$0.00	\$1.79	\$0.19	\$0.00	\$0.00	\$30.96	\$40.80
5th 6 Months	\$21.47		\$8.08	\$0.50	\$0.72	\$0.00	\$1.79	\$0.19	\$0.00	\$0.00	\$32.75	\$43.48
6th 6 months	\$23.26		\$8.08	\$0.50	\$0.72	\$0.00	\$1.79	\$0.19	\$0.00	\$0.00	\$34.54	\$46.17
7th 6 Months	\$26.84		\$8.08	\$0.50	\$0.72	\$0.00	\$1.79	\$0.19	\$0.00	\$0.00	\$38.12	\$51.54
8th 6 Months	\$28.62		\$8.08	\$0.50	\$0.72	\$0.00	\$1.79	\$0.19	\$0.00	\$0.00	\$39.90	\$54.21
9th 6 Months	\$30.41		\$8.08	\$0.50	\$0.72	\$0.00	\$1.79	\$0.19	\$0.00	\$0.00	\$41.69	\$56.89
10th 6 Months	\$32.20		\$8.08	\$0.50	\$0.72	\$0.00	\$1.79	\$0.19	\$0.00	\$0.00	\$43.48	\$59.58
Apprentice If Hired After 5-01-2017	Percent											
1st Year	40.00	\$14.31	\$8.08	\$0.00	\$0.72	\$0.00	\$2.83	\$0.19	\$0.00	\$0.00	\$26.13	\$33.29
2nd Yeat	50.00	\$17.89	\$8.08	\$0.50	\$0.72	\$0.00	\$2.69	\$0.19	\$0.00	\$0.00	\$30.07	\$39.01
3rd Year	60.00	\$21.47	\$8.08	\$0.50	\$0.72	\$0.00	\$2.69	\$0.19	\$0.00	\$0.00	\$33.65	\$44.38
4th Year	70.00	\$25.05	\$8.08	\$0.73	\$0.72	\$0.00	\$4.24	\$0.19	\$0.00	\$0.00	\$39.01	\$51.53
5th Year	80.00	\$28.62	\$8.08	\$0.74	\$0.72	\$0.00	\$4.24	\$0.19	\$0.00	\$0.00	\$42.59	\$56.91

Special Calculation Note : Other is Industry and International Training Fund.

Ratio :

Jurisdiction (* denotes special

1 Journeymen to 2 Apprentice
4 Journeymen to 3 Apprentice
6 Journeymen to 4 Apprentice
9 Journeymen to 5 Apprentice

jurisdictional note) :
CARROLL*, STARK, WAYNE

3 Journeyman to 1 Apprentice Thereafter

Special Jurisdictional Note : In Carroll County the following townships are included: Ross, Monroe, Union, Lee, Orange, Perry and London.

Details :

Prevailing Wage Rate Skilled Crafts

Name of Union: Roofer Local 88

Change # : LCN01-2020fbLoc88

Craft : Roofer Effective Date : 06/04/2020 Last Posted : 06/04/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Roofer	\$27.00		\$8.90	\$8.95	\$0.40	\$0.00	\$1.25	\$0.15	\$0.00	\$0.00	\$46.65	\$60.15
HELPERS												
Helper -500 Hrs. 1st 6 months	\$15.12		\$2.25	\$0.00	\$0.40	\$0.00	\$1.25	\$0.15	\$0.00	\$0.00	\$19.17	\$26.73
Helper - 500 Hrs. 2nd 6 months	\$16.74		\$8.90	\$8.95	\$0.40	\$0.00	\$1.25	\$0.15	\$0.00	\$0.00	\$36.39	\$44.76
2nd year Helper	\$18.36		\$8.90	\$8.95	\$0.40	\$0.00	\$1.25	\$0.15	\$0.00	\$0.00	\$38.01	\$47.19
3rd year Helper	\$19.98		\$8.90	\$8.95	\$0.40	\$0.00	\$1.25	\$0.15	\$0.00	\$0.00	\$39.63	\$49.62
4th year Helper	\$21.60		\$8.90	\$8.95	\$0.40	\$0.00	\$1.25	\$0.15	\$0.00	\$0.00	\$41.25	\$52.05
5th year Helper	\$23.22		\$8.90	\$8.95	\$0.40	\$0.00	\$1.25	\$0.15	\$0.00	\$0.00	\$42.87	\$54.48
6th year Helper	\$24.84		\$8.90	\$8.95	\$0.40	\$0.00	\$1.25	\$0.15	\$0.00	\$0.00	\$44.49	\$56.91
Apprentice	Percent											
1st 6 months w/500 hrs	56.00	\$15.12	\$8.90	\$8.95	\$0.40	\$0.00	\$1.25	\$0.15	\$0.00	\$0.00	\$34.77	\$42.33
2nd 6 months w/500 hrs	62.00	\$16.74	\$8.90	\$8.95	\$0.40	\$0.00	\$1.25	\$0.15	\$0.00	\$0.00	\$36.39	\$44.76
3rd 6 months w/500 hrs	68.00	\$18.36	\$8.90	\$8.95	\$0.40	\$0.00	\$1.25	\$0.15	\$0.00	\$0.00	\$38.01	\$47.19
4th 6 months w/500 hrs	74.00	\$19.98	\$8.90	\$8.95	\$0.40	\$0.00	\$1.25	\$0.15	\$0.00	\$0.00	\$39.63	\$49.62

5th 6 months w/500 hrs	80.00	\$21.60	\$8.90	\$8.95	\$0.40	\$0.00	\$1.25	\$0.15	\$0.00	\$0.00	\$41.25	\$52.05
6th 6 months w/500 hrs	86.00	\$23.22	\$8.90	\$8.95	\$0.40	\$0.00	\$1.25	\$0.15	\$0.00	\$0.00	\$42.87	\$54.48
7th 6 months w/500 hrs	92.00	\$24.84	\$8.90	\$8.95	\$0.40	\$0.00	\$1.25	\$0.15	\$0.00	\$0.00	\$44.49	\$56.91
8th 6 months w/500 hrs	100.00	\$27.00	\$8.90	\$8.95	\$0.40	\$0.00	\$1.25	\$0.15	\$0.00	\$0.00	\$46.65	\$60.15

Special Calculation Note : Roofers working in any form of coal tar pitch, whether hot or cold, installing and/or removing will be paid \$.25 more per hour.
 Other \$.15 is for C.I.D.B.

Ratio :

No helper shall be used on any one job unless 1 Journeymen, and 1 Apprentices are working on said job .One (1) Journeymen to One (1) Apprentice to One (1) Helper

Jurisdiction (* denotes special jurisdictional note) :

ASHLAND, CARROLL, COSHOCTON, CRAWFORD, HOLMES, HURON, LORAIN*, MEDINA, PORTAGE, RICHLAND, STARK, SUMMIT, TUSCARAWAS, WAYNE

Special Jurisdictional Note : In Lorain County (South of the Turnpike)

Details :

Prevailing Wage Rate Skilled Crafts

Name of Union: Sheet Metal Local 33 (Akron)

Change # : LCN03-2020fbLoc33Akron

Craft : Sheet Metal Worker Effective Date : 09/23/2020 Last Posted : 09/23/2020

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Sheet Metal Worker	\$32.12		\$8.50	\$12.89	\$1.21	\$0.00	\$6.60	\$0.00	\$0.00	\$0.00	\$61.32	\$77.38
Industrial Door	\$23.08		\$7.38	\$5.33	\$0.17	\$0.00	\$1.87	\$0.00	\$0.00	\$0.00	\$37.83	\$49.37
Apprentice Helper Trainee												
1st 60 Days Probationary Period	\$11.63		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$11.63	\$17.44
61 days-12 Months	\$12.97		\$7.38	\$1.84	\$0.17	\$0.00	\$1.25	\$0.00	\$0.00	\$0.00	\$23.61	\$30.10
2nd Year	\$15.20		\$7.38	\$1.84	\$0.17	\$0.00	\$1.40	\$0.00	\$0.00	\$0.00	\$25.99	\$33.59
3rd Year	\$16.32		\$7.38	\$1.84	\$0.17	\$0.00	\$1.48	\$0.00	\$0.00	\$0.00	\$27.19	\$35.35
4th Year	\$17.89		\$7.38	\$1.84	\$0.17	\$0.00	\$1.58	\$0.00	\$0.00	\$0.00	\$28.86	\$37.81
5th Year	\$19.23		\$7.38	\$1.84	\$0.17	\$0.00	\$1.67	\$0.00	\$0.00	\$0.00	\$30.29	\$39.91
Apprentice	Percent											
Apprentice												
1st year	45.00	\$14.45	\$8.50	\$3.47	\$0.17	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$26.59	\$33.82
2nd year	50.00	\$16.06	\$8.50	\$4.62	\$1.21	\$0.00	\$3.30	\$0.00	\$0.00	\$0.00	\$33.69	\$41.72
3rd year	55.00	\$17.67	\$8.50	\$5.00	\$1.21	\$0.00	\$3.30	\$0.00	\$0.00	\$0.00	\$35.68	\$44.51
4th year	65.00	\$20.88	\$8.50	\$5.77	\$1.21	\$0.00	\$3.30	\$0.00	\$0.00	\$0.00	\$39.66	\$50.10
5th year	80.00	\$25.70	\$8.50	\$6.93	\$1.21	\$0.00	\$3.30	\$0.00	\$0.00	\$0.00	\$45.64	\$58.48

Special Calculation Note : No special calculations for this skilled craft wage rate are required at this time.

Ratio :

- 1 Journeymen to 1 Apprentice
- 2 Journeymen to 1 Apprentice
- 3 Journeymen to 2 Apprentice
- 4 Journeymen to 2 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

- ASHLAND, CARROLL, COSHOCTON,
- CRAWFORD, HOLMES, MEDINA, PORTAGE,
- RICHLAND, STARK, SUMMIT, TUSCARAWAS,
- WAYNE

5-7 Journeymen to 3 Apprentice
8-10 Journeymen to 4 Apprentice
11-13 Journeymen to 5 Apprentice
14, 15 Journeymen to 6 Apprentice
and maintaining a three to one apprentice ratio
thereafter.

Special Jurisdictional Note :

Details :

Scope of Work: This Agreement covers the rates of pay and conditions of employment of all employees of the Employer engaged in, but not limited to, the a) manufacture, fabrication, assembling, handling, erection, installation, dismantling, conditioning, adjustment, alteration, repairing and servicing of all ferrous or non-ferrous metal work and all other materials used in lieu thereof and of all HVAC systems, air-veyor systems, exhaust systems, and air handling systems regardless of material used, including the setting of all equipment and all reinforcements in connection therewith; (b) all lagging over insulation and all duct-lining; (c) testing, servicing, and balancing of all air-handling equipment and duct work; (d) the preparation of all shop and field sketches, whether manually drawn or computer assisted, used in fabrication and erection, including those taken from original architectural and engineering drawings or sketches, and (e) metal roofing; and (f) all other work included in the jurisdictional claims of Sheet Metal Worker's International Association.

Industrial Door-Installation and service of overhead doors roll up doors, docks and dock leveling.

3 Journeymen To 1 Apprentice

ASHLAND, CARROLL, COSHOCTON,
CRAWFORD, HOLMES, MEDINA, PORTAGE,
RICHLAND, STARK, SUMMIT, TUSCARAWAS,
WAYNE

Special Jurisdictional Note :

Details :

Work but not limited to:Exterior application of manufactured and/or job site fabricated metal decking, siding and exterior appurtenances thereto. The erection of pre-engineered metal buildings, pre-manufactured gas stations and appurtenances thereto. The installation of metal roofs and appurtenances. The erection and/or job site fabrication of draft or fire curtains and appurtenances thereto.

Prevailing Wage Rate Skilled Crafts

Name of Union: Sprinkler Fitter Local 669

Change # : LCN02-2020fbLoc669

Craft : Sprinkler Fitter Effective Date : 01/01/2021 Last Posted : 12/22/2020

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Sprinkler Fitter	\$40.40		\$10.55	\$7.00	\$0.52	\$0.00	\$5.12	\$0.10	\$0.00	\$0.00	\$63.69	\$83.89
Apprentice Indentured after April 1, 2013	Percent											
CILASS 1	45.00	\$18.18	\$7.75	\$0.00	\$0.52	\$0.00	\$0.00	\$0.10	\$0.00	\$0.00	\$26.55	\$35.64
CLASS 2	50.00	\$20.20	\$7.75	\$0.00	\$0.52	\$0.00	\$0.00	\$0.10	\$0.00	\$0.00	\$28.57	\$38.67
CLASS 3	54.38	\$21.97	\$10.55	\$7.00	\$0.52	\$0.00	\$1.15	\$0.10	\$0.00	\$0.00	\$41.29	\$52.27
CLASS 4	59.38	\$23.99	\$10.55	\$7.00	\$0.52	\$0.00	\$1.15	\$0.10	\$0.00	\$0.00	\$43.31	\$55.30
CLASS 5	64.38	\$26.01	\$10.55	\$7.00	\$0.52	\$0.00	\$1.40	\$0.10	\$0.00	\$0.00	\$45.58	\$58.58
CLASS 6	69.38	\$28.03	\$10.55	\$7.00	\$0.52	\$0.00	\$1.40	\$0.10	\$0.00	\$0.00	\$47.60	\$61.61
CLASS 7	74.38	\$30.05	\$10.55	\$7.00	\$0.52	\$0.00	\$1.40	\$0.10	\$0.00	\$0.00	\$49.62	\$64.64
CLASS 8	79.38	\$32.07	\$10.55	\$7.00	\$0.52	\$0.00	\$1.40	\$0.10	\$0.00	\$0.00	\$51.64	\$67.67
CLASS 9	84.38	\$34.09	\$10.55	\$7.00	\$0.52	\$0.00	\$1.40	\$0.10	\$0.00	\$0.00	\$53.66	\$70.70
CLASS 10	89.38	\$36.11	\$10.55	\$7.00	\$0.52	\$0.00	\$1.40	\$0.10	\$0.00	\$0.00	\$55.68	\$73.73

Special Calculation Note : \$0.10 for Other is National Fire Sprinkler Association

Ratio :

1 Journeyman to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

ADAMS, ALLEN, ASHLAND, ASHTABULA, ATHENS, AUGLAIZE, BELMONT, BROWN, BUTLER, CARROLL, CHAMPAIGN, CLARK, CLERMONT, CLINTON, COLUMBIANA, COSHOCTON, CRAWFORD, DARKE, DEFIANCE, DELAWARE, ERIE, FAIRFIELD, FAYETTE, FRANKLIN, FULTON, GALLIA, GREENE, GUERNSEY, HAMILTON, HANCOCK, HARDIN, HARRISON, HENRY, HIGHLAND, HOCKING, HOLMES, HURON, JACKSON, JEFFERSON, KNOX, LAWRENCE, LICKING, LOGAN, LUCAS, MADISON, MAHONING, MARION, MEDINA, MEIGS, MERCER, MIAMI, MONROE, MONTGOMERY, MORGAN, MORROW,

MUSKINGUM, NOBLE, OTTAWA, PAULDING,
PERRY, PICKAWAY, PIKE, PORTAGE, PREBLE,
PUTNAM, RICHLAND, ROSS, SANDUSKY,
SCIOTO, SENECA, SHELBY, STARK, SUMMIT,
TRUMBULL, TUSCARAWAS, UNION, VAN
WERT, VINTON, WARREN, WASHINGTON,
WAYNE, WILLIAMS, WOOD, WYANDOT

Special Jurisdictional Note :

Details :

Sprinkler Fitter work shall consist of the installation, dismantling, maintenance, repairs, adjustments, and corrections of all fire protection and fire control systems including the unloading, handling by hand, power equipment and installation of all piping or tubing, appurtenances and equipment pertaining thereto, including both overhead and underground water mains, fire hydrants and hydrant mains, standpipes and hose connections to sprinkler systems used in connection with sprinkler and alarm systems. Also all tanks and pumps connected thereto, also included shall be CO-2 and Cardox Systems, Dry Chemical Systems, Foam Systems and all other fire protection systems.

Prevailing Wage Rate Skilled Crafts

**Name of Union: Truck Driver Bldg & HevHwy Class 1
Locals 20,40,92,92b,100,175,284,438,377,637,908,957**

Change # : LCON1-2019fbBldgHevHwy

Craft : Truck Driver Effective Date : 09/11/2019 Last Posted : 09/11/2019

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Truck Driver CLASS 1 4 wheel service, dump, and batch trucks, Oil Distributor - Asphalt Distributor-Tandems	\$28.04		\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$43.14	\$57.16
Apprentice	Percent											
First 6 months	80.00	\$22.43	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$37.53	\$48.75
7-12 months	85.00	\$23.83	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$38.93	\$50.85
13-18 months	90.00	\$25.24	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$40.34	\$52.95
19-24 months	95.00	\$26.64	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$41.74	\$55.06
25-30 months	100.00	\$28.04	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$43.14	\$57.16

Special Calculation Note : No special calculations for this skilled craft wage rate are required at this time.

Ratio :

3 Journeymen to 1 Apprentice per company/project

Jurisdiction (* denotes special jurisdictional note) :

ADAMS, ALLEN, ASHLAND, ASHTABULA, ATHENS, AUGLAIZE, BELMONT, BROWN, BUTLER, CARROLL, CHAMPAIGN, CLARK, CLERMONT, CLINTON, COLUMBIANA, COSHOCTON, CRAWFORD, DARKE, DEFIANCE, DELAWARE, ERIE, FAIRFIELD,

FAYETTE, FRANKLIN, FULTON, GALLIA,
GREENE, GUERNSEY, HAMILTON,
HANCOCK, HARDIN, HARRISON, HENRY,
HIGHLAND, HOCKING, HOLMES, HURON,
JACKSON, JEFFERSON, KNOX, LAWRENCE,
LICKING, LOGAN, LORAIN, LUCAS,
MADISON, MAHONING, MARION, MEDINA,
MEIGS, MERCER, MIAMI, MONROE,
MONTGOMERY, MORGAN, MORROW,
MUSKINGUM, NOBLE, OTTAWA, PAULDING,
PERRY, PICKAWAY, PIKE, PORTAGE, PREBLE,
PUTNAM, RICHLAND, ROSS, SANDUSKY,
SCIOTO, SENECA, SHELBY, STARK, SUMMIT,
TRUMBULL, TUSCARAWAS, UNION, VAN
WERT, VINTON, WARREN, WASHINGTON,
WAYNE, WILLIAMS, WOOD, WYANDOT

Special Jurisdictional Note :

Details :

** Asphalt - Oil spray bar man when operating from cab shall receive \$0.20 cents per hour above their Basic Hourly Rate.

Prevailing Wage Rate Skilled Crafts

**Name of Union: Truck Driver Bldg & HevHwy Class 2
Locals 20,40,92,92b,100,175,284,438,377,637,908,957**

Change # : LCRO1-2019-fbBldgHevHwy

Craft : Truck Driver Effective Date : 10/16/2019 Last Posted : 10/16/2019

	BHR	Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
		H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification											
Truck Driver CLASS 2 Tractor Trailer-Semi Tractor Trucks-Pole Trailers-Ready Mix Trucks-Fuel Trucks- Asphalt-Oil Spray bar men- 5 Axle & Over -Belly Dumps-End Dumps-Articulated Dump Trucks- Low boys-Heavy duty Equipment(irrespective of load carried) when used exclusively for transportation-Truck Mechanics (when needed)	\$28.46	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$43.56	\$57.79
Apprentice	Percent										
First 6 months	80.00	\$22.77	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$37.87	\$49.25
7-12 months	85.00	\$24.19	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$39.29	\$51.39
13-18 months	90.00	\$25.61	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$40.71	\$53.52
19-24 months	95.00	\$27.04	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$42.14	\$55.66
25-30 months	100.00	\$28.46	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$43.56	\$57.79

Special Calculation Note : No special calculations for this skilled craft wage rate are required at this time.

Ratio :

3 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

ADAMS, ALLEN, ASHLAND, ASHTABULA, ATHENS, AUGLAIZE, BELMONT, BROWN, BUTLER, CARROLL, CHAMPAIGN, CLARK, CLERMONT, CLINTON, COLUMBIANA, COSHOCTON, CRAWFORD, DARKE, DEFIANCE, DELAWARE, ERIE, FAIRFIELD,

FAYETTE, FRANKLIN, FULTON, GALLIA,
GREENE, GUERNSEY, HAMILTON,
HANCOCK, HARDIN, HARRISON, HENRY,
HIGHLAND, HOCKING, HOLMES, HURON,
JACKSON, JEFFERSON, KNOX, LAWRENCE,
LICKING, LOGAN, LORAIN, LUCAS,
MADISON, MAHONING, MARION, MEDINA,
MEIGS, MERCER, MIAMI, MONROE,
MONTGOMERY, MORGAN, MORROW,
MUSKINGUM, NOBLE, OTTAWA, PAULDING,
PERRY, PICKAWAY, PIKE, PORTAGE, PREBLE,
PUTNAM, RICHLAND, ROSS, SANDUSKY,
SCIOTO, SENECA, SHELBY, STARK, SUMMIT,
TRUMBULL, TUSCARAWAS, UNION, VAN
WERT, VINTON, WARREN, WASHINGTON,
WAYNE, WILLIAMS, WOOD, WYANDOT

Special Jurisdictional Note :

Details :

** Asphalt - Oil spray bar man when operating from cab shall receive \$0.20 cents per hour above their Basic Hourly Rate.

**Sugar Creek Water Treatment Plant
Filter Backwash Dechlorination Facility
The City of Canton Water Department**

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**Sugar Creek Water Treatment Plant
Filter Backwash Dechlorination Facility
The City of Canton Water Department**

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**Sugar Creek Water Treatment Plant
Filter Backwash Dechlorination Facility
The City of Canton Water Department**

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1.01 TECHNICAL SPECIFICATIONS:

The Technical Specifications and Project Plans are provided within this Invitation to Bid and at the Purchasing Department website at <https://cantonohio.gov/448/Purchasing-Procurement> as Appendix C.

All item numbers referenced to in the drawings refer to the State of Ohio Department of Transportation Construction and Material Specifications, 2019 Edition. All equipment, material and workmanship shall be performed according to these specifications and any Ohio Department of Transportation Standard Construction Drawings (SCD) referenced on the plans.

Supplemental Specification 01-00

PROJECT DOCUMENTATION AND SUBMITTAL REQUIREMENTS FOR ALL PUBLIC WORK PROJECTS AND SUBDIVISION DEVELOPMENTS

September, 2000

* Revised May, 2017

Project Submittals: The following listed items are the full responsibility of the Contractor. These items become part of the administrative duties imposed upon this Contract. The Contractor shall be responsible for submitting all detail items prior to the contract Notice of Commencement, or as directed by the City's Project Manager. A typewritten letter shall accompany all items, on Company letterhead; clearly describe each item submitted. If Contractor elects to fax any documentation due to expediency, the Contractor will be responsible for submitting hard copy for project documentation. The City will reject any information not clearly legible.

The City will not pay directly for the performance of the work listed. This work is a subsidiary obligation of the Contractor.

1. Preconstruction Video
2. Statements of Final Compliance

1. **Preconstruction Video:** Prior to actual construction, the Contractor shall take video recording of the entire length and width of the work site.
 - a) The Contractor shall notify the Engineering Department prior to scheduling the video recording of the site. A representative of the Engineering Department shall be present when the recording this video.
 - b) The video and audio recordings shall be on DVD or pre-approved alternative for replay. Contractor must submit alternative medium to the Engineer and approval received prior to scheduling.
 - c) The video portion shall have continuous time and date incorporated into it, locations and person(s) doing the work.
 - d) Audio comments during the recording must address each item in the field of view as it may pertain to the project construction. The recording technician will need to become familiar with the project plans to know what subject matter is pertinent. Further, contractor must incorporate a post recording review and audio comments into the recording.
 - e) Submitted copies of all recordings are the property of the Engineer. Contractor must submit the recording and be accepted in full by the Engineering Department prior to the start of construction.
2. **Statements of Final Compliance:** The Contractor shall submit to the City the following documentation, in addition to the Project's General Conditions. All submittals shall be completed and approved prior to the release of the final retainer.
 - a) Certificates of Substantial and Final Completion. Contractor shall submit in writing, the date on which work is substantially completed and upon Final Completion. Any deviation from the stated contract completion date to what is being submitted shall be explained further by the Contractor. The City, at their discretion, will further review this subject, as needed.

b) Final Waiver of Lien

Contractor shall furnish a written report indicating the resolution of any and all property damage claims filed with Contractor by any party during the contract period. The information shall include the name of claimant; date filed with Contractor; name of Insurance Company and/or Adjustor handling the claim; how the claim was resolved; if claim was not resolved for the full amount, a statement indicating the reason for such action. If there were no damage claims filed with the Contractor, then this shall be so stated in the report.

SECTION 01 11 00

SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **General.** The Contractor shall provide all labor, materials, tools, and equipment necessary to construct the project in accordance with the plans and as specified herein. Coordinate all work performed by subcontractors for proper workmanship and compliance with plans and specifications.
- B. **Contract Work.** A new building shall be constructed to hold four (4) 330-gallon totes and two chemical feed pumps for metering chemical into the main outfall sewer of the three lagoons upstream of the headwall at the stream where the samples are collected. Chemical tubing shall be used to carry the Sodium Bisulfite solution to the effluent Manhole No. 11 through a 3" carrier pipe and tubing to the point of application where it is injected into the effluent stream where the chlorine residual is reduced. The Contract can be summarized as follows:
 - 1. Provide project management including construction schedule, schedule of values, and list of submittals. Request for Information (RFIs) if needed, and submittals of all materials and equipment to be incorporated into the new work. Any changes in field conditions that affect schedule or cost, or scope must be submitted by the Contractor in writing and approved in by the Owner prior to proceeding with work.
 - 2. Clear the site to brush, strip and store topsoil. Remove the existing fence as shown on plans and install temporary fencing around construction area.
 - 3. Throughout the duration of the project, the Contractor under Item No. 1 shall provide all labor, materials, tools, and equipment to maintain all slope protection and SWPPP provisions until work is complete.
 - 4. Excavate for the new foundations and construct reinforced concrete footers including formwork, rebars, wire ties, water stops, expansion joints, and construction joints as show on plans. Furnish and install water lines, electrical conduit and process piping through wall sleeves of footer and stub up through floor slab. Install insulation board along footers and backfill excavation.
 - 5. Compact subgrade to form sump and floor slab. Install plastic moisture barrier and insulation board under floor slab. Furnish and install embedded grating support angles in formwork for concrete containment sump to support new fiberglass grating. Construct reinforced concrete sump and floor slab, including rebar, water stops, control and expansion

- joints. Coat the interior of the containment sump in the building with chemically resistant epoxy coating suitable for intended use.
6. Provide all labor, materials, equipment, and tools to erect the new 384 square foot insulated metal building including structural columns, purlins, girts, steel framing. Pre-finished metal siding and standing seam roof, ridge beam, vent, insulation batts, interior metal liner plates for walls and ceiling, insulated metal overhead door, mandoor, wall louvers and vent openings.
 7. Furnish and install chemical pumps and piping as shown on plans. Excavate and install new 3-inch diameter carrier pipe from building to MH #11. Pull tubing through carrier pipe and install discharge piping in manhole. Connect tubing to rigid PVC piping and valves fed from two wall-mounted chemical pumps. Install and provide suction tubing from pumps to totes with chemicals (the 4 totes and 1 chemical feed pump will be provided by the City; 1 chemical feed pump shall be provided by the Contractor). Test all piping for leaks and correct any defects.
 8. Excavate for new drain manhole adjacent to building, and backfill excavation when manhole is installed. Furnish and install new precast concrete drain manhole including flat top cover with embedded aluminum single leaf floor door and manhole steps. Install watertight seals for drainpipe that passes through the wall. Coat the interior of the drain manhole and containment sump in building with chemically resistant epoxy coating suitable for intended use. Perform water leak test on the drain manhole, sump, and piping in accordance with the specifications, and repair any defective or leaking joints.
 9. Furnish and install cold and hot water lines, pipe insulation, valves, and accessories as shown on plans. Install eyewash including backflow preventer, hot water tank, eyewash, piping, valves, and accessories.
 10. Furnish and install new electric unit heater and thermostat. Cut openings in walls of metal building to install louvers and exhaust fans and provide labor and materials to mount ventilation equipment.
 11. Furnish and install new electrical wiring to feed new Dechlorination Building from the existing junction box at the Aerator Building, and run new ductbank, conduit, and wiring to connect to the existing circuit breaker in MCC in the Electrical Room as shown on plans. Provide all excavation and backfill to install underground electrical cables and ductbank, and repair asphalt pavement removed to install new ductbanks. Install electrical panels and transformers in Dechlorination Building. Furnish and install all conduit and wiring to install new chemical pumps, unit heater, exhaust fan, interior and exterior lighting at the locations shown on the plans. Provide electrical boxes, switches, devices, conduit, wiring, hangers and supports to install new lighting and receptacles at locations shown on plans.
 12. Remove all construction debris, trailers, and equipment from the construction site. Restore the site to proposed grade elevations, and install concrete drive apron, sidewalk, and gravel drives. Install new fence as shown on plans. Fine grade, topsoil and seed all disturbed areas.
 13. When work is completed, the Contractor shall remove all SWPPP materials and grade all disturbed areas of new work, fix or replace any damaged asphalt pavement, to establish proper elevations at the building,

roadway, and surrounding areas that drain to the existing 30” storm sewer, electrical ductbanks, material laydown areas, construction trailer parking areas, and any areas disturbed during construction of the Dechlorination Building. After final grade is established, spread topsoil and seed all disturbed areas. Dispose off-site, all waste concrete and asphalt material removed from demolished roadways.

14. Item 1 shall include the cost for all performance bonds, insurance, project management, site supervision, administrative costs, profit and overhead costs, mobilization costs, providing temporary construction facilities, temporary electrical service, sanitary facilities, water.

C. **Definition of the extent of Contract Work.** The extent of the Contract is indicated in the Contract Documents. Except where no other more specific description is contained in the Contract Documents, general names and terminology on the drawings and in specification sections determines which prime Contract includes a specific element of work.

1. Local custom and trade union jurisdictional settlements do not control the scope of work included in each prime Contract. When a potential jurisdictional dispute or similar interruption of construction activities is first identified or threatened, the affected prime Contracts shall promptly negotiate a reasonable settlement to avoid or minimize the pending interruption and its delays.

1.3 QUALITY ASSURANCE

- A. **Codes and Standards.** Perform all work in compliance with all federal, state, and local codes.

1.4 SUBMITTALS

- A. **Submittal Requirements.** See other Division 1 sections for required administrative submittals and for procedures necessary for transmittal of submittals.

1.5 JOB CONDITIONS

Not used.

1.6 DELIVERY, STORAGE, AND HANDLING

Not used.

1.7 SPECIAL WARRANTY

Not used.

1.8 OWNER OCCUPANCY

- A. **Full Owner Occupancy.** The Owner will occupy the site off and on during the entire construction period. Cooperate with the Owner during construction

operations to minimize conflicts and facilitate Owner usage. Perform the work so as not to interfere with the Owner's operations.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not Applicable.

END OF SECTION

SECTION 01 32 16

CPM SCHEDULES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** The Contractor shall perform the work necessary to provide the Critical Path Method (CPM) schedules for all work in accordance with the drawings and as specified herein.
- B. **Requirements.** This section specifies administrative and procedural requirements for the CPM of scheduling and reporting progress of the work.
 - 1. Refer to General Conditions and the Agreement for definitions and specific dates of Contract Time.
 - 2. In case of Multiple Contractors, the General Contractor shall prepare the CPM schedules. All other Contractors must submit and coordinate activities.

1.3 QUALITY ASSURANCE

- A. **Consultant.** The Contractor shall retain a Consultant to provide CPM scheduling services, including planning, evaluating, and reporting.
 - 1. The Consultant shall be a recognized specialist, expert in the CPM of scheduling and reporting, and acceptable to the Engineer/Architect.
 - 2. The Consultant shall have computer facilities available with sufficient capacity to process detailed network diagrams within 48 hours of a request.
- B. **In-House Option.** The requirement to retain a Consultant may be waived if the Contractor can demonstrate to the Engineer/Architect's satisfaction that:
 - 1. The Contractor has the computer equipment required to produce CPM network diagrams.
 - 2. The Contractor employs skilled personnel who are experienced in CPM scheduling and reporting techniques.
- C. **Program.** Use a computer software program for network analysis that has been developed specifically to manage CPM construction schedules and is acceptable to the Engineer/Architect.
- D. **Standards.** Comply with procedures contained in "The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry," published by The Associated General Contractors of America.

1.4 SUBMITTALS

- A. **Preliminary Network Diagram.** Within 15 calendar days after the date of the Notice to Proceed, submit a preliminary network diagram outlining activities for the first 90 days of construction. Include a skeleton diagram for the remainder of the work with the preliminary diagram.
 - 1. Include each significant construction activity. Coordinate each activity in the network with other activities. Schedule each construction activity in proper sequence.
 - 2. Indicate completion of the work in advance of the date established for Substantial Completion.
- B. **Schedule of Values.** With the submittal of the preliminary network diagram, include a schedule of values and a preliminary monthly cash requirement prediction based on all indicated activities.
- C. **Tabulation of Submittals.** With the submittal of the preliminary network diagram, include a tabulation by expired date of submittals required during the construction. List those required to maintain orderly progress of the work, and those required early because of long lead time for manufacture or fabrication. Contractor shall allow 2 weeks' time for Engineer/Architect's first review and 2 weeks' time for Engineer/Architect's second review.
- D. **Distribution.** Distribute the preliminary network diagram to all parties that need to know about construction activities that are scheduled during the first 3 months, including the Engineer/Architect and Owner.

1.5 JOB CONDITIONS

Not used.

1.6 DELIVERY, STORAGE, AND HANDLING

Not used.

1.7 SPECIAL WARRANTY

Not used.

1.8 DEFINITIONS

- A. **Critical Path Method.** CPM is a construction scheduling technique using network analysis diagrams to plan and organize construction activities in an orderly manner along the critical path.
- B. **Network.** A network diagram is a graphic representation showing the relationship of activities and events in the correct sequences required to complete the project within the Contract Time.
- C. **Activity.** An activity is any single identifiable step in the project. It depends upon and cannot begin until completion of all preceding activities.

1. Critical activities are activities with no (zero) float time and are, therefore, operations that determine the critical path and control project completion.
- D. **Event.** An event is the starting or ending point of an activity and occurs only when all preceding activities have been completed.
- E. **Float Time.** The amount of time available for a given activity in excess of its estimated duration. It represents the amount of leeway available in scheduling an activity. All float time belongs to the Owner.
1. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.
 2. Total float is the amount of time an activity can be delayed without adversely affecting overall time for project completion.

PART 2 - PRODUCTS

2.1 CPM SCHEDULE

- A. **General.** Prepare a CPM schedule in accordance with Part 3 of this section. The CPM schedule shall include a complete listing of all abbreviations and symbols utilized within the CPM schedule.

PART 3 - EXECUTION

3.1 CPM SCHEDULE

- A. **General.** Prepare a CPM Construction Schedule using the network analysis diagram system known as the Critical Path Method (CPM) following procedures outlined in "The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry," as published by The Associated General Contractors of America.
1. Follow the steps necessary to complete development of the network diagram in sufficient time so that the CPM schedule can be submitted and accepted for use no later than 60 calendar days after the date of the Notice to Proceed.
 2. Conduct educational workshops to train and inform key project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
 3. Establish procedures for monitoring and updating the CPM schedule and for reporting progress; coordinate procedures with progress meeting and payment request dates. Use "one working day" as the unit of time.
- B. **CPM Schedule Preparation.** Prepare a listing of all activities involved in the project; include every activity having a bearing on the time required to complete the work. Provide the best data available for generation of the network diagram and CPM schedule.
1. Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities.

2. Indicate estimated times for the following activities to be performed:

- a. Preparation and processing of submittals.
- b. Purchase of materials.
- c. Delivery.
- d. Fabrication.
- e. Installation.

C. **Processing.** Enter prepared data on the processing system. Process data to produce output data or a computer drawn time scaled network based on calendar days. Draw network by hand if the equipment is unable to do so. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the best possible CPM construction schedule within the limitations of Contract Time.

D. **Format.** Display the full network on a single sheet of stable transparency, or other reproducible media, of sufficient width to show data clearly for the entire construction period.

1. Mark the critical path. Locate the critical path near the center of the network; locate paths with the most float near the edges.
2. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

E. **Initial Issue.** Prepare the initial issue of the CPM Schedule network diagram from a listing of straight "early start total float" sort. Identify critical activities. Prepare tabulated reports to show the following:

1. Contractor or subcontractor and work or activity.
2. Principal events of that activity.
3. Early and late start dates.
4. Early and late finish dates.
5. Activity duration in working days.
6. Total float or slack.
7. Average size of work force.
8. Dollar value of activity (coordinated with Schedule of Values).
9. Value Summaries. Prepare two cumulative value listings, sorted by finish dates.

a. In first listing, tabulate the following:

- 1) Activity number.
- 2) Early finish date.
- 3) Dollar value.
- 4) Cumulative dollar value.

- b. In the second listing, tabulate the following:
 - 1) Activity number.
 - 2) Late finish date.
 - 3) Dollar value.
 - 4) Cumulative value.
 - c. In subsequent issues of both listings, substitute actual finish dates for activities completed as of date of listing.
 - d. Prepare listing for ease of comparison with payment requests; coordinate timing with Progress Meetings.
 - e. In both value summary listings, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
 - f. Submit value summary printouts following each regularly scheduled progress meeting.
- F. **Submittal and Distribution.** Submit the initial issue of the tabulations and network for acceptance. When authorized, distribute copies to the Engineer/Architect (three copies), Owner, principal subcontractors and suppliers or fabricators, and others identified by the Contractor with a need-to-know schedule responsibility.
- 1. Post copies in the project meeting rooms and temporary field office.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the work and are no longer involved in performance of construction activities.
 - 3. Submit copies of each computer produced report (listing) in duplicate to Engineer/Architect.
- G. **Schedule Updating.** Revise the schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each project meeting.

END OF SECTION

SECTION 01 33 00

SUBMITTALS

PART 1 - GENERAL

- 1.1 **RELATED DOCUMENTS.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.
- 1.2 **DESCRIPTION OF WORK**
- A. **Scope of Work.** Provide all labor and materials necessary to furnish the following submittals as required by each individual section of the specifications.
1. Shop drawings.
 2. Product data.
 3. Samples/mock-ups.
 4. Operation and Maintenance (O&M) manuals.
 5. Personnel qualifications.
 6. Training documents.
 7. Source quality control documents.
 8. Material field test reports.
 9. Start-up documents.
 10. Operational demonstration documents.
 11. Product/material certifications.
 12. Special warranties.
 13. Project record documents.
 14. Others (as specified in the individual technical specifications).
- 1.3 **QUALITY ASSURANCE** (Not used)
- 1.4 **SUBMITTALS**
- A. **General.** Submit all submittals in accordance with the requirements within this specification section.
- B. **Submittal Package No. 1 – Submittal Schedule**
1. Submit a submittal schedule according to paragraph 2.05 of Section 00 70 00, "General Conditions."
 - a. This schedule shall include all submittals that are required to be used on the project, and the date of submittal to the Engineer/Architect.
 - b. Include in schedule a milestone for notification of the Engineer/Architect prior to field-verifying operation and maintenance manuals.
 - c. Submittals requiring multiple submissions shall include multiple listings on the documents.

- d. The Engineer/Architect will review the list and make any necessary comments.
- e. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
- f. Coordinate transmittal of different types of submittals for related elements of the work so processing will not be delayed by the need to review submittals concurrently.
- g. Processing. Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals, depending upon the complexity of the submittal.
 - 1) Allow 4 weeks for processing each submittal.
 - 2) No extension of the Contract Time will be authorized because of failure to transmit submittals to the Engineer/Architect sufficiently in advance of the work to permit processing.

1.5 **JOB CONDITIONS** (Not used)

1.6 **DELIVERY, STORAGE, AND HANDLING**

- A. **Store and protect large samples and mock-ups** until the Project is completed, then properly dispose of off-site.
- B. **Maintain and make available** to the Engineer/Architect, at the job site, a complete file of all approved submittals as part of the project record documents.

1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

2.1 **SUBMITTAL TRANSMITTAL**

- A. **Transmit each submittal** from the Contractor to Engineer/Architect using a transmittal form. Include the following on the transmittal form.
 - 1. Relevant information and requests for data.
 - 2. Deviations from Contract Document requirements, including minor variations and limitations.
 - 3. The specification section number.
 - 4. Other pertinent information to identify the items being submitted.

2.2 GENERAL REQUIREMENTS FOR SUBMITTALS

A. Originals

1. The Contractor, the subcontractors, or suppliers shall generate submittal information.
2. No reproductions of partial (or complete) versions of the plans, sections, details, schematics, specification pages, etc., from the Contract Documents are acceptable.

B. Complete Submittals. Clearly describe the equipment to be furnished with complete and detailed submittal information.

C. Identification. Properly identify all submittal-related documents and arrange in a logical order to best present the information. Provide an index that includes the following on every submittal.

1. Manufacturer's name and address.
2. Submittal date and revision number, if applicable.
3. Contract identification and specification section.
4. Drawing scale and orientation.
5. Submittal page number or sequence of pages.
6. Drawing number.

D. Verification

1. Where existing conditions or structures exist, field-verify dimensions, elevations, clearances, etc.
2. The submittal shall not be accepted for review until such verified data is clearly indicated.

E. Legends

1. All submittal diagrams, drawings, schematics, etc., shall include complete keys, legends or similar explanation as to the graphics, and symbols and abbreviations used.
2. In general, all graphics, symbols, abbreviations, and equipment nomenclature used for a submittal shall duplicate those used on the Contract Drawings.

F. Approvals. Provide the following on each submittal.

1. A space approximately 4" x 5" on to record the Contractor's review and approval markings and the action taken. These shall include the Contractor's:
 - a. Approval stamp.
 - b. Signature.
 - c. Date of approval.
 - d. Deviations from the Contract Documents.

2. An equal area beside the Contractor's review and approval markings for the Engineer/Architect's review stamp.
- G. **One Section per Submittal.** Each submittal shall pertain to only one specification section.
- H. **All submittal information shall be:**
1. Neatly arranged.
 2. Legible.
 3. Not distorted or faded.
 4. English.
 5. In United States standard units.
 6. Typed.
- I. **All letters, certifications, and similar documents** shall be submitted in their entirety. Single pages of multiple-page letters, or letters with deleted passages will not be acceptable for submittal purposes.
- J. **"Generic" letters, test reports,** material certifications, or similar documents which do not specifically address the requirements of the Contract Documents for the actual materials being furnished will not be acceptable.
- K. **Mark all submittals** to clearly indicate the full extent of the equipment to be furnished.
1. Indicate all options to be provided, materials of construction, dimensions, and other information pertinent to the submittal.
 2. Options, materials, and dimensions which do not pertain to the materials or equipment to be furnished shall be neatly marked out so as to avoid confusion and doubt during review, delivery, and installation.
- L. **Resubmittals must clearly identify** all changes and revisions.
1. The drawing shall be marked "revised" with the revision date indicated.
 2. Each resubmittal shall reference the previous submittal by the Engineer/Architect's log number.
- M. **"By Others"**
1. All submittals are reviewed as if prepared by the Prime Contractor.
 2. The term "By Others" is appropriate to indicate supply by the Owner or another Prime Contractor.
 3. Where a subcontractor or supplier uses the term "By Others" to indicate work by the Prime Contractor or another subcontractor or supplier, the Prime Contractor shall change "By Others" to indicate the actual source.
- N. **Deviations from Contract.** Highlight, encircle, or otherwise indicate deviations from the Contract Documents in all submittals.

2.3 SPECIFIC SUBMITTAL-TYPE REQUIREMENTS

- A. **Shop Drawings.** The following paragraphs detail the general requirements for shop drawings and specific requirements for specific types of shop drawings.
1. General Requirements.
 - a. A shop drawing is a detailed representation of the work to be performed to demonstrate compliance with the Contract Drawings including:
 - 1) Material and equipment layout.
 - 2) Fabrication drawings.
 - 3) System and electrical schematic diagrams.
 - 4) Equipment and material schedules.
 - 5) Installation details.
 - b. Submit newly prepared information, drawn to accurate scale.
 - c. Standard information prepared without specific reference to the project is not considered shop drawings.
 2. Equipment/Material Layout Drawings.
 - a. Include:
 - 1) Plot plans.
 - 2) Plant site maps.
 - 3) Equipment location plans.
 - 4) Equipment and material layout plans and sectional views.
 - 5) Connection detail drawings.
 - 6) Similar drawings showing the incorporation of materials and equipment into the work.
 - 7) The physical layout to scale, including elevations, plant grid coordinates, dimensions to new/existing structures, and other items of the work.
 - 8) Dimensions.
 - 9) Labeling.
 - 10) Notes.
 - 11) Legends.
 - 12) Bills of materials.
 - 13) All other information required to graphically describe the proposed work.
 3. System Schematics and Diagrams.
 - a. These include schematic representations of systems and equipment in a manner which shows the relative relationship of the components within the system and interconnections or interfaces with other systems or equipment.

- b. These systems shall be shown on the most appropriate type and format of schematic diagram.
- c. Diagrams shall identify all equipment and other components.
- d. Indications shall be provided of system features such as flow directions, flow ranges, component sizes, capacities, settings, interlocks, component identification, and component or subsystem function.
- e. Various types of systems for which schematic diagrams shall be required include:
 - 1) Electrical Distribution Systems.
 - 2) Control Systems.
 - 3) Alarm Systems.
- f. In some instances it may be appropriate to combine multiple types of system schematics onto a single drawing. In general, this practice would be appropriate for simple, self-contained systems and the adjacent subsystems and when required to clearly show system functionality.

B. **Product Data.** Product data is submittal information that fully describes the item to be incorporated into the work. Product data shall include when applicable:

- 1. Manufacturer name.
- 2. Catalog cut-sheets.
- 3. General descriptive bulletins/brochures/specifications.
- 4. Materials of construction data and parts list.
- 5. Finish/treatment data.
- 6. Equipment/material weight/loading data.
- 7. Power/utility requirements.
- 8. Engineering design data, calculations, and system analyses.
- 9. Digital system documentation.
- 10. Any deviations from the contract documents.
- 11. Material Certifications. These include signed certificates or declarations by the Contractor, supplier, manufacturer, testing laboratory, or recognized certification agency which document that materials and product composition or construction comply with specified requirements and stated reference standards.
- 12. Manufacturer's printed recommendations.
- 13. Compliance with recognized trade association and testing agency standards.
- 14. Application of testing agency labels and seals.
- 15. Notation of dimensions verified by field measurement.
- 16. Notation of coordination requirements.
- 17. Specific response to detailed specification requirements.
- 18. Maximum operating pressure and temperature ratings.

19. Other information specifically called for under the sections of Divisions 1 through 44 shall be included in this category.

C. Samples or Mock-Ups (Not Applicable)

1. Samples. Samples are portions of or complete units of the precise article proposed to be furnished.
2. Color and Pattern Charts. When the precise color and pattern are not specifically prescribed in the Contract Documents, or when the Contract Documents require that a product be furnished in a color or pattern directed by the Owner or Owner's Representative, submit accurate color charts and pattern charts of the available ranges for review and selection.
3. Mock-Ups. Build mock-ups with full-size products to match the scale of the proposed construction to demonstrate compliance with specified requirements and construction standards.

D. O&M Manuals

1. General.
 - a. Bind each copy in an appropriately sized three-ring notebook a cover designating the name of equipment, maintenance, and specification section number.
 - b. Bind operation and maintenance instructions for each specification section in a separate notebook.
2. Required Information. Include the following information to provide a description of the incorporation of the equipment into the work and with functional data to evaluate equipment operation.
 - a. Operation Sequence Descriptions. These shall:
 - 1) Include complete, detailed written descriptions of the operating sequence of all control systems and operations in all modes.
 - 2) Be specifically prepared for this work.
 - 3) Be fully referenced to control diagrams and system components.
 - 4) Include start-up and shut-down procedures and operations under manual, automatic, and emergency (alarm) conditions and any alternate operating modes.
 - 5) Include operation of switches, lights, timers, relays, contacts, valves, motors, and equipment components.
 - 6) Describe interlock functions including system safety functions.
 - b. Software/Programming Documentation.
 - 1) Reference this documentation to the Operating Sequence Descriptions and include flow charts, program source codes listings, and documentation ladder diagrams with

- detailed descriptions for each rung of the software provided.
- 2) Provide information to instruct and to familiarize the operator with the system programming to enable a step-by-step evaluation of the program.
 - 3) Provide notations, remarks, and labeling on the program source code listing to indicate the program operation and function.
 - 4) Provide any additional narrative description of the program operation to fully describe the system parameters and functionality in a clear and logical manner.
- c. Manufacturer's Instructions. Include:
- 1) Installation, routine preventive maintenance, troubleshooting, and lubrication instructions.
 - 2) Procedures for moving, supporting, and anchoring of equipment, including tolerances for settings and adjustment.
 - 3) Storage requirements to protect products prior to installation and during periods of prolonged shutdown.
 - 4) Storage requirements of extra materials.
- d. Parts List. Include assembly, exploded-view illustrations, or sectional drawings with all parts identified. Also include descriptions, quantity (per assembly) required, and original equipment manufacturer's part numbers.
- e. Supplier Data. Provide addresses, telephone numbers, and names of contact persons for equipment manufacturer and manufacturer's representative. Include both regional (local) and home offices.
- f. Warranties and Guarantees. Include copies of the approved draft warranties in the initial operation and maintenance manual submittal. Following substantial completion, provide copies of the executed final warranties for insertion into the final operation and maintenance manuals.
- g. Approved Submittals. Provide a complete list (including submittal numbers) of all approved submittals pertaining to the operation and maintenance instructions.
- h. Copies of all materials shipped with the equipment.
- i. Copies of all approved submittals including control wiring diagrams.

E. Personnel Qualifications

1. General. These qualification statements and information pertain to personnel and entities employed in the prosecution of the work.
2. Specific Information. Provide the following information regarding the proposed personnel or entity.
 - a. Education/training.
 - b. Company employment history.
 - c. Professional experience.
 - d. References.
 - e. Certifications or licenses.

Stated qualifications shall be pertinent to the specific task for which qualifications are requested.

F. Training Documents (Not Applicable)

1. Instructors' Qualifications. See paragraph 2.3 E.
2. Proposed schedule for the training sessions.
3. Lesson Plan. Lesson plans shall:
 - a. Be O&M manual-based.
 - b. Cover all components of each system regardless of source of supply or manufacturer.
 - c. Detail the instructional objective statement on the goal(s) intended to be achieved by the end of the training session.
 - d. Indicate the category of training (operation, maintenance, and electrical instrumentation); describe the session including length and type (classroom or field) and the instructor.
4. One copy of all instructional material to be used during training.
5. A sign-in sheet containing the signature of each attendee, training topic, and date after the training is completed.

G. Source Quality Control Documents

1. Inspection.
 - a. Inspection data includes inspection procedures and results of factory inspections of products, equipment, or systems.
 - b. Within this type of submittal information are factory witness test procedures, schedules and reports, and similar data.
2. Testing.
 - a. Test data is the information leading to or resulting from tests performed on materials, equipment, or systems at the manufacturer's facilities or in testing laboratories.
 - b. This also includes data on testing equipment.
 - c. Examples of test data include all information, test arrangement, drawings, illustrations, diagrams, curve plots, graphs, and other data which substantiates or establishes a material or product characteristic, quality, or other trait as a result of test required by the Contract Documents.

H. Material Field Test Reports

1. Report Data. Written reports of each inspection, test, or similar service shall include, but not be limited to:
 - a. Date of issue.
 - b. Project title and number.
 - c. Name, address, and telephone number of testing agency.
 - d. Dates and locations of samples and tests or inspections.
 - e. Names of individuals making the inspection or test.
 - f. Designation of the work and test method.
 - g. Identification of product and specification section.
 - h. Complete inspection or test data.
 - i. Test results and interpretations of test results.
 - j. Ambient conditions at the time of sample taking and testing.
 - k. Comments or professional opinion as to whether inspected or tested work complies with Contract Document requirements.
 - l. Name and signature of laboratory inspector.
 - m. Recommendations on testing.
2. Example reports covered by this paragraph include compaction tests and concrete, leakage, and disinfection tests.

I. Start-Up Documents (Not Applicable)

Start-Up Request. Start-up requests shall include the following:

- a. Qualifications of Manufacturer's Representative. See paragraph 2.3 E.
- b. Field Test Procedures.

- 1) List of materials and equipment necessary for testing.
 - 2) Calibration. Certification of calibration of all test instruments used.
 - 3) Test Form Report. Copy of testing results report form.
- c. Proposed start-up schedule including all field testing.
2. Manufacturer's Representative's Reports.
- a. Each manufacturer's representative shall prepare a report on every site visit for each system or item of equipment inspected, adjusted, started up, or worked on.
 - b. If a manufacturer's representative visits the site for equipment specified in several specification sections, a separate report shall be filed for each specification section.
 - c. The report shall state:
 - 1) The purpose of the visit.
 - 2) The representative's observations and conclusions.
 - 3) Recommendations for further visits or action.
 - 4) A tabulation or log of the settings of all adjustable components.
 - a) Initial settings shall be recorded and submitted on the first visit.
 - b) During subsequent visits, the manufacturer's representative shall add the current or adjusted setting to the tabulation or log.
 - 5) Include manufacturer's certification that equipment being tested has been inspected with regard to conformance to the plans, specifications, and shop drawings and that it has been tested and is ready for operational demonstration.
 - 6) All test reports for all required field testing.

J. Operational Demonstration Documents (Not Applicable)

Operational Demonstration Request. Include the following:

- a. Name, address, and telephone number of all representatives during the operational demonstration.
- b. Sample operational demonstration log for Engineer/Architect review.

2. Operational Demonstration Log.
 - a. An operational demonstration log is a continuous chronological record of operational status of the system and equipment.
 - b. Include all changes in status or system parameters, adjustments, and results of tests.
 - c. Make entries, noting the date and time, at the occurrence of each event.
 - d. Use acceptable operational demonstration log forms.

K. Special Warranties

1. There are two general types of warranties covered by this specification.
 - a. Manufacturer's Express Warranties.
 - 1) These are formal statements of certifications by manufacturers which warrant to the Owner that products and equipment are free from defects in material and workmanship.
 - 2) These are standard warranties issued with products and equipment which supplement the Contractor's warranty and may also extend coverage past the expiration of the Contractor's warranty.
 - 3) Include with the manufacturer's warranty data shall be a notification of the availability of an extension to the standard warranty including terms.
 - b. Special Express Warranties.
 - 1) The form, format, and conditions of special warranties are described in the various specification sections of the Contract Documents.
 - 2) These are formal warranties above and beyond the Contractor's warranty and manufacturer's standard warranties.
 - 3) These warranties may be based on performance, power consumption, maintenance projects, or other operating parameters.
 - 4) Extended warranties, service contracts, and performance bonds are also included under this category.
2. Term or Period. Unless otherwise established by individual sections in Divisions 2 through 44, all Contractor express warranties shall extend for 1 calendar year from the date of substantial completion of the project or acceptance date of the product or portion of work thereof, whichever is the later date.
3. Content of Warranty. The warranty shall contain, as applicable:
 - a. Effective starting date of the warranty period.
 - b. Statement of the terms and conditions of the warranty, if any.

L. Project Record Documents

1. Project record documents are to be in accordance with paragraph 6.12 of Section 00 70 00, "General Conditions."
2. Record Contract Drawings. Legibly mark contract drawings to record actual construction including:
 - a. Depths of various elements of foundation in relation to data.
 - b. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
 - c. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
 - d. Field changes of dimension and detail.
 - e. Changes made by change order or field order.

M. Extra Materials/Spare Parts

1. Coat or package extra materials to prevent corrosion or deterioration during long-term indoor storage.
2. Clearly label all packaging with:
 - a. Part name.
 - b. Part number.
 - c. Associated equipment name and number.
 - d. Manufacturer's name and address.
 - e. The required storage environment for the materials.

- N. **Other.** These include special tools/repair parts list, photographs, videos, certificates, construction schedules, drawings, reports, meeting minutes, data, and information required by the Contract Documents which do not logically fall into the submittal types defined above.

PART 3 - EXECUTION

3.1 SUBMITTAL PREPARATION AND TRANSMITTAL

A. Coordination

1. Coordinate preparation and processing of submittals with performance of construction activities.
2. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay and in accordance with the submittal schedule.
3. The General Contractor is responsible for resolving any disputes between Prime Contractors over submittals.

B. Verification

1. Verify the correctness and completeness of all submittals prior to forwarding same for review.
 2. All submittals shall comply with the Contract Documents.
- C. **Package each submittal** appropriately for transmittal and handling including a transmittal form.
- D. **The Prime General Contractor shall submit** the minimum number of submittals as listed in paragraph 3.3 of this specification.
- E. **Submittals received from sources** other than the Prime General Contractor will be returned without action.
- F. **Other Prime Contractors shall submit** all submittals through the Prime General Contractor.

3.2 ENGINEER/ARCHITECT'S REVIEW AND ACTION

A. General

1. Except for submittals for record, information, or similar purposes where action and return is not required or requested, the Engineer/Architect will review each submittal, mark to indicate action taken, and return promptly.
2. Cost to review any submittal more than twice will be deducted from Contractor's monthly estimates and final payments.
3. The Engineer/Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

B. Action Stamp. The Engineer/Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate action taken.

1. Final Unrestricted Release. Where submittals are marked "Approved," that part of the work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
2. Final-but-Restricted Release. When submittals are marked "Approved as Noted," that part of the work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.

3. Returned for Resubmittal.
 - a. When submittal is marked "Not Approved" and/or "Revise and Resubmit," do not proceed with that part of the work covered by the submittal, including purchasing, fabrication, delivery, or other activity.
 - b. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
 - c. Do not permit submittals marked "Not Approved" and/or "Revise and Resubmit" to be used at the project site or elsewhere where work is in progress.

3.3 MINIMUM NUMBER OF SUBMITTALS AND DISTRIBUTION

- A. **After a submittal has been approved**, the Engineer/Architect will make the following distribution:

Submittal	Minimum No. of Submittals	Distribution		Engineer/ Architect
		Owner	Contractor	
1. Shop Drawings	7	1	4	2
2. Product Data	7	1	4	2
3. Samples/Mock-Ups	2	1	0	1
4. O&M Manuals	7	4	1	2
5. Personnel Qualifications	4	1	1	2
6. Training Documents	4	1	1	2
7. Source Quality Control Documents	4	1	1	2
8. Material Field Test Reports	4	1	1	2
9. Start-Up Documents	4	1	1	2
10. Operational Demonstration Documents	4	1	1	2
11. Special Warranties	4	1	1	2
12. Project Record Documents	1	1	0	0
13. Extra Materials	1	1	0	0
14. Others	4	1	1	2

B. **Multiprime Contract Distribution.**

1. The Engineer/Architect will forward all reviewed submittals to the Prime General Contractor only.
2. The Prime General Contractor is then responsible to send each submittal to every Prime Contractor that it affects for their use.

3.4 SPECIFIC SUBMITTAL-TYPE EXECUTION REQUIREMENTS

A. O&M Manuals (Not Used)

B. Sample Panels

1. Construct any required sample panels on-site for fascia, expansion joint, and flashing.
2. Construct sample panels only after the individual samples and components used in the sample panel have been approved.
3. If a sample panel does not conform to the Contract requirements, construct additional ones until conformance is achieved.

C. **Samples for Tests.** Furnish samples of material as may be required for examination and test. Take all samples of materials for tests according to standard methods or as provided in the Contract Documents.

END OF SECTION

SECTION 01 35 26

HEALTH AND SAFETY PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract apply to this section.

1.2 DESCRIPTION OF WORK

- A. **General.** The Contractor shall provide the labor, tools, equipment, and materials necessary to protect all persons on or near the premises from unreasonable risks of injury that arise during or as a result of this work in accordance with the drawings and as specified herein.

1.3 QUALITY ASSURANCE

- A. **Codes.** Perform all work in compliance with applicable requirements of governing agencies having jurisdiction and in accordance with the plans and as specified herein.

B. Standards

1. Manual of Accident Prevention in Construction published by Associated General Contractors of America.
2. Occupational Safety & Health Administration's (OSHA's) confined-space entry procedures.
3. Applicable state or federal occupational health and safety standards.
4. Other reasonable safety rules and practices established.

1.4 SUBMITTALS

Not used.

1.5 JOB CONDITIONS

Not used.

1.6 DELIVERY, STORAGE, AND HANDLING

Not used.

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

- 3.1 **SAFETY COORDINATOR.** Contractor shall provide a person who, in addition to their other construction duties, will act as the safety coordinator for the work of this contract including but not limited to health and safety considerations associated with the work. The safety coordinator shall have experience in safety and health aspects of construction work, shall work on improving the safety and health of people involved in, and in the proximity of, the work of this Contract, and be on the job site during all normal work hours. The safety coordinator shall cooperate with the site Lead Safety Coordinator if one is designated by the Owner's Representative.
- 3.2 **SAFETY PROGRAM.** Contractor's safety coordinator shall establish a safety program for the job site, the safety program shall include:
- A. **A list of general and specific** safety guidelines for each trade.
 - B. **A training program for instructing each worker** to recognize and avoid unsafe conditions and to apply good safety and health practices.
 - C. **A system for ensuring that machinery and equipment** are operated only by qualified people.
 - D. **A system for tagging and removing** unsafe machinery, equipment, tools, and goods.
 - E. **A system for investigating each injury** and reporting its cause and the steps taken to prevent recurrence to the Owner.
 - F. **A system for implementing use** of personal protective equipment, as necessary.
- 3.3 **SAFETY PROGRAM REVIEW.** Contractor shall review the safety program with the Owner's Representative before commencement of any activity on the job site.
- 3.4 **CONFINED SPACE ENTRY.** Anyone entering storage tanks or similarly confined areas shall comply with OSHA's Confined Space Entry Regulations.

END OF SECTION

SECTION 01 57 13

SEDIMENT AND EROSION CONTROL

PART 1 - GENERAL

- 1.1 **RELATED DOCUMENTS.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to work in this section.
- 1.2 **DESCRIPTION OF WORK**
- A. **Scope of Work.** Provide all labor, tools, equipment, and materials necessary to furnish and maintain the soil erosion controls where shown, where shown on the Contractor's Storm Water Pollution Prevention Plan (SWP3), where directed, and as specified herein.
- B. **SWP3 Preparation.** Prepare an SWP3 for this project, obtain necessary permits, provide dust control, and terminate coverage under the permits, if necessary, upon completion of the work.
- 1.3 **QUALITY ASSURANCE**
- A. **Codes and Standards.** Perform all work required in the control of erosion during construction in compliance with the following standards as referenced herein:
1. ODOT – Ohio Department of Transportation. Construction and Material Specifications (most recent edition).
 2. ODNR – Ohio Department of Natural Resources. "Rainwater and Land Development Ohio's Standards for Stormwater Management Land Development and Urban Stream Protection" (Rainwater and Land Development) current edition.
 3. Ohio EPA – Ohio Environmental Protection Agency.
 - a. National Pollutant Discharge Elimination System (NPDES) Permit No. OHC000002, "Authorization for Storm Water Discharges Associated with Construction Activity Under the National Pollutant Discharge Elimination System" (General NPDES Permit).
- B. **Conflicts.** In the event of a conflict between these requirements and pollution control laws, rules, or regulations of other federal, state, or local agencies, the more restrictive laws, rules, regulations, or standards shall apply.
- 1.4 **SUBMITTALS**
- A. **General.** Submit all submittals in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.

B. Submittal Package No. 1 – SWP3 and Notice of Intent (NOI) Form (as needed)

1. Submit the Contractor's SWP3 including associated drawings and details of sediment and erosion control measures that will be employed during the project.

1.5 JOB CONDITIONS

A. Construction Sites Less than 1 Acre

1. SWP3. Develop and implement an SWP3 for the control of sediment and erosion at this project site throughout construction. At a minimum the SWP3 shall include the following:
 - a. Site drawing showing the limits of all earth-disturbing activities, location of proposed temporary access roads or stockpiles, and location of all proposed sediment and erosion control features (i.e., silt fencing, sediment basins, temporary seeding, etc.). Include details for installation and material specifications for each erosion control feature.
 - b. Written description of the proposed sediment and erosion control measures that will be employed, including a schedule for installation and removal of temporary controls as they are related to actual site construction. Also include information regarding site soils, any permanent or temporary seeding, an inspection and maintenance schedule, and all measures that will be employed by any subcontractors.

- B. Sediment and Erosion Control Shown on the Plans.** The sediment and erosion control measures shown on the plans, if any, are considered to be the minimum level of control required. Prepare the final SWP3 and use, if appropriate, alternate methods and locations of sediment and erosion control to meet the site requirements provided they are approved.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. **General.** Handle all sediment and erosion control materials in accordance with the manufacturer's recommendations.
- B. **Storage.** Store all seeds for temporary seeding in a safe, dry location protected from weather conditions that may affect the seed viability.

1.7 SPECIAL WARRANTY (Not used)

PART 2 - PRODUCTS

- 2.1 **GENERAL.** The SWP3 shall incorporate some or all of the following equipment and materials for sediment and erosion control measures, as appropriate. Alternative materials and methods as presented in ODOT Item 832 or ODNR's Rainwater and Land Development manual may be considered.

- A. **Sediment Barriers.** Sediment barriers are temporary measures using woven wire or other approved material attached to posts with filter cloth of burlap and plastic filter fabric to intercept, detain, and control sediment and erosion from leaving the construction site.
1. Filter Fabric/Silt Fence. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester, or ethylene yarn. Fabric shall be ODOT Item 712.09, Type C or equal.
 2. Wire Fencing. Wire fence reinforcement for silt fences at storm drain inlets shall be a minimum of 42 inches in height and a minimum of 14 gauge, and shall have a maximum mesh spacing of 6 inches.
 3. Silt Fence Posts. Posts for silt fences shall be either 2-inch-by-2-inch hardwood or equivalent steel with a minimum length of 32 inches. Steel posts shall have projections for fastening wire to them.
 4. Storm Drain Inlet Protection Framing. Stakes and framing for yard, drainage ditch, or parking lot inlet protection shall be 2-inch-by-4-inch wood (preferred) or equivalent metal with a minimum length of 3 feet for the stakes/posts.
- B. **Matting.** Matting shall be agricultural straw or coconut fiber within photodegradable netting, jute, excelsior, or approved equal synthetic material as specified in ODOT Items 671 and 712.11.
- C. **Temporary Seeding and Mulching.** Temporary seeding and mulching are measures consisting of seeding, mulching, fertilizing, and matting used to reduce erosion. All cut-and-fill slopes including borrow pits shall be seeded and/or mulched where and when necessary to eliminate erosion.
1. Materials. Mulch.
 - a. Straw. Straw mulch shall be unrotted small-grain straw, free of sticks or other foreign material.
 - b. Wood Cellulose Fiber. Wood cellulose fiber mulch shall be dyed green and not inhibit seed germination.
 2. Fertilizer. Fertilizer shall contain 12 percent total nitrogen, 12 percent available phosphoric acid, and 12 percent water-soluble potash. The name of plant nutrients, weight, and quarantined percentages shall be marked on the sealed containers.
- D. **Sediment Structures.** Sediment basins, dams, and dikes are prepared storage areas to trap and store sediment from construction areas and to protect properties and stream channels below the construction areas from siltation.
- E. **Rock Channel Protection.** Aggregate for the rock channel protection, dams, erosion control, or other uses indicated on the drawings, shall be provided in accordance with ODOT Item 601. Gradation/type shall be as noted on the drawings.

PART 3 - EXECUTION

3.1 GENERAL

- A. **Examination.** Inspect the existing and proposed site drainage patterns in order that the most efficient methods of erosion control may be selected through the duration of construction.
- B. **Fill material and equipment storage** is prohibited within 200 feet of the stream bank, in the floodplain, in wooded areas, or in other environmentally sensitive areas. Dispose of surplus excavated materials off-site.
- C. **Maintenance.** Be responsible for ongoing inspection and maintenance of the sediment and control features. At a minimum, complete an inspection log at least every 7 calendar days and within 7 days of each rainfall event. Repair/replace damaged features.
- D. **Dust Control.** Minimize dust generation, including wetting down unpaved areas during the construction activities.

3.2 PREPARATION

A. General

1. Limit the surface area of erodible earth material exposed by the clearing and grubbing, excavation, borrow, and fill operations and provide immediate permanent or temporary control measures to prevent contamination of adjacent streams or other water courses, lakes, ponds, or other areas of water impoundment.
2. Such work will involve the construction of temporary ditch checks, filters, benches, dikes, dams, sediment basins, and slope drains, and use of temporary mulches, mats, seeding, or other control devices or methods necessary to control erosion and sedimentation.
3. Prepare and submit an SWPPP in advance of the work.
4. Limit the area of excavation, borrow, and embankment operations in progress commensurate with capability.
5. Deliver sediment and erosion control materials at appropriate times so that the project is not delayed.
6. Do not commence with any earth-disturbing activity until the appropriate sediment and erosion control features are in place.

- B. **Sediment and Erosion Control Devices.** Minimization of denuded areas and the length of time that any area is denuded is the primary method of sediment and erosion control at any site. Adequate scheduling and the use of permanent and temporary seeding or mulching as described in paragraph 3.3 can accomplish this.

Areas that are to be denuded shall have structural control measures in place prior to exposure of the soil and such measures shall remain until the area is established and permanent measures are in place. In the case of silt fencing, which may require the rough grading to be completed prior to installation, it shall be installed as soon as practical. Structural measures shall include at a minimum:

1. Sediment basins for all drainage areas greater than 5 acres.
2. Aggregate construction entrances at all points of construction traffic egress from the site onto pavement.
3. Silt fencing at all areas of sheet flow.
4. Inlet protection at all storm water inlets.
5. Matting at all slopes greater than 3:1 and drainage swales/ditches.
6. Sediment traps or basins at all drainage areas that can not be adequately protected with silt fencing as determined by the Contractor developing the SWPPP.
7. Silt fencing around soil stockpiles or cover them with tarps.

3.3 EROSION CONTROL

A. Permanent Erosion Control

1. Incorporate all permanent erosion control features into the project at the earliest practicable time.
2. Perform the permanent seeding and mulching and other specified slope protection work in stages, as soon as substantial areas of exposed slopes can be made available.
3. Establish final grades and application of fertilizer, seed, and mulch.
4. Maintain sediment barriers until grass has grown.

B. Temporary Erosion Control

1. Provide temporary seeding and mulching as delineated in the SWP3, as directed, as specified in the general NPDES permit, and for all denuded areas that are to remain dormant for more than 21 days.
2. Apply temporary erosion control within 7 days after final or temporary grade has been reached that will remain dormant for more than 21 days.
3. For areas within 50 feet of a stream, apply temporary erosion control within 2 days after the most recent disturbance of an area that will remain dormant for more than 21 days.
4. Install temporary erosion control measures including seeding and mulching immediately if seasonal limitations make permanent control measures unrealistic.

Temporary seed shall be of the type specified in ODNR's Rainwater and Land Development manual for the time of year that it is applied. Temporary seeding shall also include application of 12-12-12 fertilizer at the rate of 6 pounds per 1,000 square feet and mulching in accordance with ODNR's Rainwater and Land Development manual.

3.4 SEDIMENT BARRIERS

A. Filter Barriers (FB). Construct the FBs using synthetic filter fabric. They are designed for sediment removal and erosion control of low or moderate channelized flows not exceeding 1 cubic foot per second (cfs).

1. The height of an FB shall be between 15 inches and 18 inches.
2. Purchase filter fabric in a continuous roll and avoid the use of joints by cutting to the length of the barrier.

3. Space the stakes a maximum of 3 feet apart at the barrier location and drive them securely into the ground (minimum of 8 inches).
4. Excavate a trench approximately 4 inches wide and 4 inches deep along the line of stakes and upslope from the barrier.
5. Staple the filter material to the wooden stakes, and extend 8 inches of the fabric into the trench. Use heavy-duty wire staples at least 1/2 inch long. Do not staple filter material to trees.
6. Backfill the trench and compact the soil over the filter material.
7. Install straw bales on the downstream side of all filter barriers. Install bales in a single row and securely anchor them with a minimum of two stakes per bale.
8. If an FB is to be constructed across a ditch line or swale, the barrier shall be of sufficient length to eliminate end flow, and the plan configuration shall resemble an arc or horseshoe with the ends oriented upslope.
9. Remove FB when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

B. **Silt Fence (SF).** SF is designed for situations in which only sheet or overland flows are expected, and the following drainage area limits are applied.

Silt Fence Maximum Drainage Area (Based on Slope of Drainage Area)	
Slope	Maximum Drainage Area (Acres) to 100 Linear Feet of Silt Fence
0-2% (<50:1)	0.5
2%-20%	0.25
>20%	0.125

SF details are included on the plans or within ODNR's Rainwater and Land Development manual.

1. Locate the silt fence at the flattest area available and follow a level contour of the land so that flows are dissipated into uniform sheet flow.
2. The height of an SF shall not exceed 36 inches (higher fences may impound volumes of water sufficient to cause failure of the structure).
3. Purchase the filter fabric in a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are necessary, splice filter cloth together only at a support post, with a minimum 6-inch overlap, and securely seal.
4. Drive posts securely into the ground (minimum of 12 inches).
5. Excavate a trench approximately 4 inches wide and 4 inches deep along the line of posts and upslope from the barrier.
6. Staple or wire the filter fabric to the fence, and extend 8 inches of the fabric into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Do not staple filter fabric to trees.
7. Backfill the trench and compact the soil over the filter fabric.
8. Remove SF when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

C. Maintenance

1. Inspect SF and FB a minimum of every 7 days and immediately after each rainfall or at least daily during prolonged rainfall. Make any required repairs immediately.
2. Should the fabric on an SF or FB decompose or become ineffective prior to the end of the expected useable life and the barrier is still necessary, replace the fabric promptly.
3. Remove sediment deposits after each storm event. They must be removed when deposits reach approximately one-half the height of the barrier.
4. Dress any sediment deposits remaining in place after the SF or FB is no longer required to conform with the existing grade, and prepare and seed them.

3.5 MATTING

A. General. Matting details are included in ODNR's Rainwater and Land Development manual. Provide matting:

1. On all final slopes 3:1 or greater.
2. Along the bottom of all drainage ditches until permanent seeding has grown and is established.
3. In areas where establishing vegetation is difficult.
4. Where mulch is difficult to hold in place due to wind or water.
5. Where water velocities exceed 3.5 feet per second.

B. Securing. Secure matting in accordance with the manufacturer's instructions or with No. 11 gauge, or heavier, sod staples that are a minimum of 6 inches in length.

C. Erosion Stops

1. Erosion stops are narrow trenches (6 to 12 inches deep) across the full channel section to prevent undermining and gullies from forming below the matting.
2. Provide them at a maximum spacing of 50 feet apart (more frequently if recommended by the matting supplier) in areas of high erosion potential and at the leading edge of a matting roll.
3. High erosion potential is in rocky areas that prevent soil-to-matting contact, erosive soils, and steep slopes.
4. Place the leading edge or piece of matting (for intermediate stops) within the narrow trench and secure it in place before backfilling the trench.

3.6 STORM DRAIN INLET PROTECTION (IP)

A. General

1. Provide temporary sediment control around all storm inlets until the tributary drainage area is permanently stabilized.
2. This shall consist of an inlet sediment filter of silt fencing as specified and detailed herein.

3. Utilize storm drain IP at all storm drain inlets in addition to matting and sediment barriers previously discussed.

B. Yard, Drainage Ditch, or Parking Lot Inlet Protection. Details are included in ODNR's Rainwater and Land Development manual.

1. Filter Fabric.
 - a. Excavate earth to a minimum depth of 18 inches around inlet.
 - b. Construct wood framing with a minimum burial depth of 8 inches at each corner of the inlet.
 - c. Filter fabric shall include a wire mesh backing for structural support.
 - d. Place backfill in 6-inch compacted lifts.
 - e. Install a compacted earth check dam in the ditch line below the inlet if runoff bypassing the inlet will not flow to a sediment pond.
2. Drop Inlet Sediment Protection. Inlets may utilize an excavated drop inlet consisting of a 1- to 2-foot-deep excavation around the inlet to serve as a sediment trap.
 - a. Expanded trap volume shall be in accordance with the requirements for sediment traps contained in this specification.
 - b. Install 1-inch-diameter weep holes in the side of the inlet near the bottom of the excavated areas. Provide a gravel filter around weep holes. Weep holes shall be grouted before filling excavated area.
 - c. Remove accumulated sediment when it has reached 40 percent of the trap depth.

C. Curb Inlet Protection. Details are included in ODNR's Rainwater and Land Development manual.

1. Frame. Construct a wooden frame that is anchored to the soil located behind the curb.
2. Screen. Form a geotextile fabric screen with wire mesh backing to the concrete gutter and against the face of the curb. Extend the screen 2 feet beyond the inlet throat on either end and fasten to the frame.
3. Stone. Place 2-inch stone over the screen to prevent water from entering the inlet under or around the geotextile fabric.

3.7 SEDIMENT TRAPS. Provide temporary sediment traps for sediment control for drainage areas totaling less than 5 acres when SF would be inadequate or inappropriate. Traps have a simple outlet structure stabilized with geotextile and riprap. Sediment trap details are included in ODNR's Rainwater and Land Development manual.

A. Design

1. Volume. Sediment trap shall include a minimum water volume of 67 cubic yards (cy) per acre of contributing drainage area plus sediment

- storage of 1,000 cubic feet (cf) per disturbed area of contributing area. Provide a larger water volume if required by the general NPDES permit.
- 2. Side Slopes. Maximum side slopes of 3:1.
- 3. Depth. 1.5 feet above outlet crest. Utilize a maximum height of 5 feet.
- 4. Dimensions. Maximize sediment removal efficiencies by maximizing surface areas and providing a minimum length-to-width ratio of 2:1.
- 5. Outlet. Provide either a piped discharge with outlet riser or an overflow spillway that is properly sized to ensure safe release of all storm water. Locate outlets, as much as practical, on the opposite side of the storm water entrance in order to avoid short-circuiting and maximize the sediment removal efficiency.
- 6. Channel Protection. Protect outlet spillways from erosion through use of a filter fabric and rock channel protection (ODOT Type C or D).

B. **Maintenance.** Maintain sediment level below the minimum water volume.

3.8 **SEDIMENT BASINS AND DAMS.** Sediment basins are sediment traps required for drainage areas greater than 5 acres. Sediment basins are larger than sediment traps and include dams that are regulated by the ODNR, Division of Water. Sediment basin details are included in ODNR's Rainwater and Land Development manual.

A. **Design**

- 1. Volume. Minimum water volume of 67 cy per acre of contributing area plus sediment storage volume of 1,000 cf per disturbed acre of contributing area.
- 2. Depth. Optimum depth of 3 feet, maximum of 5 feet.
- 3. Dimensions. Minimum length-to-width ratio of 2:1.
- 4. Side Slopes. Maximum of 3:1.
- 5. Outlet. Include both a primary and emergency spillway. Size the primary to pass a 10-year, 24-hour storm with the maximum water level at the crest of the emergency spillway. Emergency spillway shall pass the 100-year, 24-hour storm.
- 6. Reference. See ODNR's Rainwater and Land Development Manual for additional sizing and design criteria.

B. **Permitting.** If the sediment basin is such that it qualifies as a dam regulated by ODNR, obtain the appropriate permits and approvals from ODNR prior to construction of the dam. Submit a copy of this permit/approval prior to commencement of construction.

C. **Maintenance.** Remove deposited sediment when 40 percent of the initial volume has been filled with silt.

3.9 **ROCK CHANNEL PROTECTION.** Provide rock channel protection at all storm outlets in accordance with ODOT Item 601.

3.10 **TOP SOIL STOCKPILE.** Provide temporary drainage diversion of runoff around the topsoil stockpile to control soil erosion. Provide silt fencing around stockpiles or cover stockpiles with tarps to prevent erosion for sediment control.

3.11 **STREAM BANK WORK.** Special attention must be given at stream bank work locations to prevent erosion into the stream. Provide SF or drainage ditches with sediment traps at such locations. Hold to a minimum the entire disturbed area around any stream bank work. Designate trees and vegetation to be removed; clearly mark and protect those to be preserved. Following construction, promptly vegetate all sites other than roadways.

3.12 **STREAM CROSSINGS AND WORK WITHIN THE STREAM**

A. General

1. Avoid stream crossings and work within a stream when possible.
2. However, for certain work it may be necessary to work within the stream channel or develop a temporary crossing.
3. Keep to a minimum the time that is required to perform this work or that any temporary crossing is maintained, and remove any crossing as soon as possible.
4. Construct the culverts, bridges, and other structures of nonerrodible material and size appropriately.
5. Be responsible for obtaining all local, state, or U.S. Army of Corps of Engineers (USACE) approvals or permits necessary prior to commencement of constructing the stream-crossing measure.
6. To reduce erosion and siltation impacts, perform construction in water courses only during periods of dry weather and low-flow conditions.

3.13 **CONSTRUCTION ENTRANCES/EXITS.** Install a stabilized pad of aggregate over geotextile fabric at all locations where construction vehicles leave construction areas onto surfaces where runoff is not checked by sediment controls, and at all points of egress to paved roads.

A. Design

1. Bedding. Provide a geotextile fabric bedding at the base of the construction entrance.
2. Stone. Place 2-inch stone in a layer 6 inches thick over the fabric bedding.
3. Dimensions. Entrance/exit pad shall be a minimum of 10 feet wide by 50 feet long.

B. Maintenance. Apply additional stone as necessary to replenish the entrance/exit. Remove sediment from paved roads immediately through sweeping, scraping, or other appropriate measure.

3.14 **DEWATERING**

A. General

1. Give special attention to dewatering activities to minimize release of silt-laden water into the stream.
2. The discharges shall be free of sediment and released into only storm sewers, stream channels, or other stabilized drainage sources and not onto exposed soils or any other site where flows could cause further erosion.

- 3.15 **ADDITIONAL MEASURES.** Select the sediment and erosion control measures utilized for a site based on the proposed construction activities, existing and proposed contours, site drainage system, and other site requirements or restrictions. Additional or alternative erosion and sediment control measures may be utilized with approval. Such measures include those specified in ODNR's Rainwater and Land Development manual.

END OF SECTION



Notice of Intent (NOI) For Coverage Under Ohio Environmental Protection Agency General Permit

(Read accompanying instructions carefully before completing this form)

Submission of this NOI constitutes notice that the party identified in Section I of this form intends to be authorized to discharge into state surface waters under Ohio EPA's NPDES general permit program. Becoming a permittee obligates a discharger to comply with the terms and conditions of the permit. Complete all required information as indicated by the instructions. Forms transmitted by fax will not be accepted. A check for the proper amount must accompany this form and be made payable to "Treasurer, State of Ohio." (See the fee table in Attachment D of the NOI instructions for the appropriate processing fee)

I. Applicant Information/Mailing Address

Company (Applicant) Name: _____

Mailing (Applicant) Address: _____

City: _____ State: _____ Zip Code: _____

Contact Person: _____ Phone: _____ Fax: _____

Contact E-Mail Address: _____

II. Facility/Site Location Information

Facility Name: _____

Facility Address/Location: _____

City: _____ State: _____ Zip Code: _____

County(ies): _____ Township(s): _____

Facility Contact Person: _____ Phone: _____ Fax: _____

Facility Contact E-Mail Address: _____

Quarter: _____ Section(s): _____ Range: _____

Receiving Stream or MS4: _____

If aware of a state nature preserve within 1,000 feet of the facility/site, check here:

Enter river code here, if discharge is to a river designated scenic, wild, or recreational, or to a tributary within 1,000 feet (see instructions): _____

General Permit Number: _____ Initial Coverage: _____ Renewal Coverage: _____

Type of Activity: _____

SIC Code(s): - _____ - _____ - _____ - _____

Existing NPDES Permit Number: _____

ODNR Coal Mining Application Number: _____

Outfall	Design Flow (MGD)	Latitude	Longitude
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

For Ohio EPA Use Only	
Check ID (OFA):	_____
Person:	_____
Place:	_____
DOC #:	_____
ORG #:	_____
Rev. ID #:	_____

Other DSW Permits Required: _____

Proposed Project Start Date (MO DY YR): _____ Estimated Completion Date: (MO DY YR): _____

Total Land Disturbance (Acres): _____ MS4 Drainage Area (Square Miles): _____

Payment Information: Check # _____ Check Amount: _____ Date of Check: _____

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.

Applicant Name: _____ Title: _____

Applicant Signature: _____ Date: _____



Notice of Termination (NOT) of Coverage Under Ohio Environmental Protection Agency General Permit

(Read accompanying instructions carefully before completing this form)

Submission of this NOT constitutes notice that the party identified in Section II of this form is no longer authorized to discharge into state waters under the NPDES general permit program. NOTE: All necessary information must be provided on this form. Do not use correction fluid on this form. Forms transmitted by fax will not be accepted. There is no fee associated with submitting this form.

I. Permit Information:

NPDES general permit number: OH _____ Facility General Permit Number: _____

II. Owner/Applicant Information/Mailing Address:

Company Name: _____

Contact Person: _____ Phone: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

II. Facility/Site Location Information:

Facility Name: _____

Facility Contact Person: _____ Phone: _____

Facility Address/Location: _____

City: _____ State: _____ Zip Code: _____

County: _____ Township: _____ Section: _____

IV. Reason for Termination:

_____ Transfer of Ownership _____ Cease to Discharge _____ Facility Closed _____ Project Completed
 _____ Obtained Individual Permit

Standard Certification:

I certify under penalty of law that all discharges authorized by the NPDES general permit have been eliminated or that I am no longer the operator of the facility. I understand that by submitting this NOT, I am no longer authorized to discharge under this general permit and that discharging pollutants to waters of the state without a NPDES permit is unlawful under ORC 6111.

Name (typed): _____

Signature: _____

Date: _____

Industrial Storm Water and Coal Mining Activity Certification Only:

I certify under penalty of law that all discharges associated with the identified facility that are authorized by the above referenced NPDES general permit have been eliminated, that I am no longer the operator of the facility, or in the case of a coal mine that the SMCRA bond has been released by ODNR-Division of Reclamation. I understand that, by submitting this NOT, I am no longer authorized to discharge storm water associated with industrial activity under this general permit, and that all discharging pollutants in storm water associated with industrial activity to waters of the state is unlawful under ORC 6111 where the discharge is not authorized by a NPDES permit.

Name (typed): _____

Signature: _____

Date: _____

Storm Water Construction Activity Certification Only:

I certify under penalty of law that all elements of the storm water pollution prevention plan have been completed, the disturbed soil at the identified facility have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or that all storm water discharges associated with construction activity from the identified facility that are authorized by the above referenced NPDES general permit have otherwise been eliminated. I understand that, by submitting this NOT, I am no longer authorized to discharge storm water associated with construction activity by the general permit, and that discharging pollutants in storm water associated with construction activity to waters of the state is unlawful under ORC 6111 where the discharge is not authorized by a NPDES permit.

Name (typed): _____

Signature: _____

Date: _____

SECTION 01 60 00

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

- 1.1 **RELATED DOCUMENTS.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.
- 1.2 **DESCRIPTION OF WORK.** Transport and handle materials and equipment in accordance with the manufacturer's recommendations and requirements of Contract Documents. Make all arrangements for transportation, delivery, storage, and handling of equipment and materials required for prosecution and completion of the work.
- 1.3 **QUALITY ASSURANCE** (Not used)
- 1.4 **SUBMITTALS** (Not used)
- 1.5 **JOB CONDITIONS** (Not used)
- 1.6 **DELIVERY, STORAGE, AND HANDLING**
- A. Delivery**
1. Deliver shipments of materials and equipment to the site only during regular working hours.
 2. Shipments shall be addressed and consigned to the proper party giving name of Contract, street number, and city.
 3. Shipments shall not be delivered to the Owner or Owner's Representative, except as otherwise directed.
 4. Transportation shall be in accordance with Part 3 of this section.
- B. Storage and Handling**
1. Store, handle, and protect materials in accordance with the manufacturer's recommendations and the requirements of Part 3 of this section.
 2. Maintain equipment in an undeteriorated and fully serviceable condition and as specified in Part 3 of this section.
- 1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.1 TRANSPORTATION

- A. **General.** Arrange deliveries of products in accordance with the construction schedule and in ample time to facilitate inspection prior to installation.

B. Coordination

1. Coordinate deliveries to avoid conflict with work and conditions at site and to accommodate the following:
 - a. Work of other contractors.
 - b. Limitations of storage space.
 - c. Availability of equipment and personnel for handling products.
 - d. Owner's use of premises.
2. Do not have products delivered to project site until related shop drawings have been approved.
3. Do not have products delivered to site until required storage facilities have been provided.
4. Have products delivered to site in manufacturer's original, unopened, labeled containers. Keep Engineer/Architect informed of delivery of all equipment to be incorporated in the work.

C. Inspection. Immediately upon delivery, inspect shipment to ensure that:

1. Product complies with requirements of Contract Documents and reviewed submittals.
2. Quantities are correct.
3. Containers and packages are intact and labels are legible.
4. Products are properly protected and undamaged.
5. Damaged products are rejected and removed from the site.

3.2 HANDLING

A. Methods

1. Provide equipment and personnel necessary to handle products without soiling or damaging products or packaging.
2. Lift heavy components only at designated lifting points.
3. Handle materials and equipment at all times in a safe manner and as recommended by manufacturer or supplier so that no damage will occur to them.
4. Do not drop, roll, or skid products off delivery vehicles. Hand carry or use suitable materials handling equipment.
5. Keep interiors completely free of dirt and foreign matter.

3.3 STORAGE AND PROTECTION

A. General

1. Make all arrangements and provisions necessary for the storage of materials and equipment.

2. Place all excavated materials, construction equipment, and materials and equipment to be incorporated into the work so as not to damage anything.
3. Keep materials and equipment neatly and compactly stored in locations that will cause a minimum of inconvenience to other contractors, public travel, adjoining owners, tenants, and occupants.
4. Arrange storage in a manner to provide easy access for inspection.

B. Storage Areas

1. Areas available on the construction site for storage of material and equipment shall be as shown or otherwise approved.
2. Store materials and equipment which are to become the property of the Owner in a way to facilitate their inspection and ensure preservation of the quality and fitness of the work, including proper protection against damage by freezing and moisture.
3. Lawns or other private property shall not be used for storage purposes without written permission of the Owner in control of such premises.
4. Restore all storage areas to their original condition.

C. Storage Methods

1. Do not open manufacturer's containers until the time of installation unless recommended by the manufacturer or otherwise specified.
2. Do not store products in the structures being constructed unless approved in writing.
3. The following types of materials may be stored out-of-doors and on wood blocking so there is no contact with the ground.
 - a. Masonry units.
 - b. Reinforcing steel.
 - c. Structural steel.
 - d. Piping.
 - e. Precast concrete items.
 - f. Castings.
 - g. Handrailing.
4. The following types of materials may be stored out-of-doors if covered with material impervious to water and sunlight. Store materials on wood blocking and tie down covers with rope and slope to prevent accumulation of water on covers.
 - a. Construction lumber.
 - b. Wood for formwork.
 - c. Fiberglass and plastic materials which are not ultraviolet (UV) protected.

5. Store all products not listed above in buildings or trailers which have a concrete or wooden floor, a roof, and fully closed walls on all sides.
6. Provide heated storage space for materials that would be damaged by freezing.
7. Protect mechanical and electrical equipment from contamination by dust, dirt, and moisture.
8. Maintain humidity at levels recommended by manufacturers for electrical and electronic equipment.

D. Inspection

1. Regularly inspect stored products to ensure that:
 - a. State of storage facilities is adequate to provide required conditions.
 - b. Required environmental conditions are maintained on continuous basis.
 - c. Products exposed to elements are not adversely affected.
2. Be fully responsible for loss or damage to stored materials and equipment.

3.4 MAINTENANCE

A. Maintenance Log. Prepare a maintenance log for all equipment.

1. This log shall include a list of required maintenance services and inspections, as provided by the manufacturer.
2. The log shall include checklists for the periodic services and inspections required.
3. Initial and date the checklist upon completion of the individual servicing or inspection.
4. Locate the maintenance log in the field office and have it available for review until it is submitted for record purposes upon completion of the work and the start of the warranty period.

B. Preparation

1. Before removing an item from storage, review the installation location. Protection and services at the installed location must meet the equipment storage requirements.
2. Before moving equipment to the installed location, have materials available for temporary shelter or services required to establish the proper storage environment.

C. Performance of Maintenance

1. Perform all storage and preventive maintenance and inspections required by the manufacturer at the specified intervals from the time of delivery until completion of the work.
2. When notified by the Owner or Owner's Representative of a maintenance deficiency, perform corrective maintenance. Corrective maintenance will be performed per the manufacturer.
3. Reestablish storage maintenance in the event an item or equipment is removed from service.

END OF SECTION

SECTION 01 73 29

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS.** Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **General.** Provide the labor, tools, equipment, and materials necessary to construct the project in accordance with these plans and specifications.
- B. **This section specifies administrative** and procedural requirements for cutting and patching.
- C. **Refer to other sections** for specific requirements and limitations applicable to cutting and patching individual parts of the work.
 - 1. Requirements of this section apply to mechanical and electrical installations. Refer to Divisions 22, 23, and 26 for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.
- D. **Demolition of selected portions** of the building for alterations is included in section "Selective Demolition."

1.3 QUALITY ASSURANCE

- A. **Requirements for Structural Work.** Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load deflection ratio.
 - 1. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:
 - a. Foundation construction.
 - b. Bearing and retaining walls.
 - c. Structural concrete.
 - d. Structural steel.
 - e. Lintels.
 - f. Timber and primary wood framing.
 - g. Structural decking.
 - h. Stair systems.
 - i. Miscellaneous structural metals.
 - j. Exterior curtain wall construction.
 - k. Equipment supports.
 - l. Piping, ductwork, vessels and equipment.
 - m. Structural systems of special construction in Division 13.

B. **Operational and Safety Limitations.** Do not cut and patch operating elements or safety-related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance or decreased operational life or safety.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety-related systems:
 - a. Shoring, bracing, and sheeting.
 - b. Primary operational systems and equipment.
 - c. Air or smoke barriers.
 - d. Water, moisture, or vapor barriers.
 - e. Membranes and flashings.
 - f. Fire protection systems.
 - g. Noise and vibration control elements and systems.
 - h. Control systems.
 - i. Communication systems.
 - j. Conveying systems.
 - k. Electrical wiring systems.
 - l. Special construction specified by Division 13 sections.

C. **Visual Requirements.** Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Engineer/Architect's opinion, reduce the building's aesthetic qualities or result in visual evidence of cutting and patching. Remove and replace work cut and patched in a visually unsatisfactory manner.

1. If possible retain the original installer or fabricator to cut and patch the following categories of exposed work, or if it is not possible to engage the original installer or fabricator, engage another recognized experienced and specialized firm.
 - a. Processed concrete finishes.
 - b. Stonework and stone masonry.
 - c. Ornamental metal.
 - d. Matched veneer woodwork.
 - e. Preformed metal panels.
 - f. Window wall system.
 - g. Stucco and ornamental plaster.
 - h. Acoustical ceilings.
 - i. Terrazzo.
 - j. Finished wood flooring.
 - k. Fluid applied flooring.
 - l. Carpeting.
 - m. Aggregate wall coating.
 - n. Wall covering.
 - o. Swimming pool finishes.
 - p. Heating, ventilating, and air conditioning (HVAC) enclosures, cabinets, or covers.

1.4 SUBMITTALS

- A. **General.** Submit all submittals in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.
- B. **Submittal Package No. 1 – Cutting and Patching Proposal**
1. Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal.
 - a. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.
 - b. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
 - c. List products to be used and firms or entities that will perform work.
 - d. Indicate dates when cutting and patching are to be performed.
 - e. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
 2. Approval to proceed with cutting and patching does not waive the right to later require complete removal and replacement of a part of the work found to be unsatisfactory.

1.5 **JOB CONDITIONS** (Not used)

1.6 **DELIVERY, STORAGE, AND HANDLING** (Not used)

1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

- 2.1 **MATERIALS.** Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 - EXECUTION

- 3.1 **INSPECTION.** Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed. Take corrective action before proceeding if unsafe or unsatisfactory conditions are encountered.

3.2 PREPARATION

- A. **Temporary Support.** Provide temporary support of work to be cut.
- B. **Protection.** Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the project that might be exposed during cutting and patching operations.
- C. **Avoid interference** with use of adjoining areas or interruption of free passage to adjoining areas.
- D. **Take all precautions necessary** to avoid cutting existing pipe, conduit, or ductwork serving the building but scheduled to be removed or relocated until provisions have been made to bypass them.

3.3 PERFORMANCE

A. General

- 1. Employ skilled workmen to perform cutting and patching.
- 2. Proceed with cutting and patching at the earliest feasible time and complete without delay.
- 3. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. **Cutting.** Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.

- 1. In general where cutting is required, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
- 2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
- 3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.
- 4. Comply with requirements of applicable sections of Division 31 where cutting and patching requires excavating and backfilling.
- 5. Bypass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated, or abandoned. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after bypassing and cutting.

C. **Patching.** Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

- 1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.

2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance.
4. Remove existing floor and wall coverings and replace with new materials if necessary to achieve uniform color and appearance.
5. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken containing the patch, after the patched area has received primer and second coat.
6. Patch, repair, or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.

3.4 **CLEANING.** Thoroughly clean areas and spaces where cutting and patching are performed or used as access. Remove completely paint, mortar, oils, putty, and items of similar nature. Thoroughly clean piping, conduit, and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION

SECTION 01 74 23

CLEANING

PART 1 - GENERAL

- 1.1 **RELATED DOCUMENTS.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.
- 1.2 **DESCRIPTION OF WORK**
- A. **Scope of Work.** Throughout the construction period, maintain all areas of existing buildings and site constructed or affected by the work of the Contract in a standard of cleanliness as described in this section.
- B. **Related Work Described Elsewhere.** In addition to standards described in this section, comply with all requirements for cleaning up as described in various other sections of these specifications.
- 1.3 **QUALITY ASSURANCE**
- A. **Inspection.** Conduct daily inspections, and more often if necessary, to verify that requirements of cleanliness are being met.
- B. **Codes and Standards.** In addition to the standards described in this section, comply with all pertinent requirements of governmental agencies having jurisdiction and comply with Occupational Safety and Health Administration (OSHA) Housekeeping Standards, Subpart C, Section 1926.25.
- 1.4 **SUBMITTALS** (Not used)
- 1.5 **JOB CONDITIONS** (Not used)
- 1.6 **DELIVERY, STORAGE, AND HANDLING** (Not used)
- 1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

- 2.1 **MATERIALS AND EQUIPMENT.** Provide all required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.
- 2.2 **COMPATIBILITY.** Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. General

1. Retain all stored items in an orderly arrangement allowing maximum access, not impeding drainage or traffic, and providing the required protection of materials.
2. Do not allow the accumulation of scrap, debris, waste material, and other items not required for construction of the work.
3. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
4. Comply with OSHA Section 1926-252 of Subpart H of Part 1926, Disposal of Waste Materials.
5. Provide adequate storage for all items awaiting removal from job site, observing all requirements for fire protection and protection of the environment.
6. Do not bury waste materials within the project site.

B. Site

1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material.
2. Weekly, and more often if necessary, inspect all arrangements of materials stored on the site; restack, tidy, or otherwise service all arrangements to meet the requirements of Paragraph 3.1 A of this section.
3. Maintain the site in a neat and orderly condition at all times and comply with OSHA Housekeeping Standards, Subpart C, Section 1926.25.

C. Structures

1. Weekly, and more often if necessary, inspect the structures, pick up all scrap, debris, and waste material.
2. Weekly, and more often if necessary, sweep all interior spaces clean. Interpret "Clean" (for the purpose of this subparagraph) as meaning free from dust and other material capable of being removed by use of reasonable effort and hand-held broom, except that vacuum cleaning shall also be employed if dust accumulates on surfaces above floor.
3. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using all equipment and materials required to achieve the required cleanliness.
4. Following the installation of finish floor materials, clean finish floor daily (and more often if necessary) while work is being performed in the space. Interpret "clean" (for the purpose of this subparagraph) as meaning free from all foreign material which may be damaging to the finish floor material.

3.2 FINAL CLEANING

- A. **Definition.** Except as otherwise specifically provided, interpret "clean" (for the purpose of this paragraph) as meaning the level of cleanliness generally provided by skilled cleaners using commercial-quality building maintenance materials.
- B. **General.** Prior to completion of the work, remove from the job site all tools, surplus and testing materials, equipment, scrap, debris, temporary protection, and waste. Conduct final cleaning as described in paragraph 3.1 of this section.
- C. **Site.** Unless otherwise directed, broom-clean all paved areas on the site and all public paved areas directly adjacent to the site. Completely remove all resultant debris.
- D. **Structures**
 - 1. Exterior.
 - a. Visually inspect all exterior surfaces and remove all traces of soil, waste material, smudges, and other foreign matter.
 - b. Remove all traces of splashed materials from adjacent surfaces.
 - c. If necessary to achieve a uniform degree of exterior cleanliness, hose and brush down the exterior of the structure.
 - d. In the event of stubborn stains not removable with water, lightly sandblast to remove the stain.
 - 2. Interior.
 - a. Visually inspect all interior surfaces and remove all traces of soil, waste material, smudges, and other foreign matter.
 - b. Remove all traces of splashed materials from adjacent surfaces.
 - c. Remove all paint droppings, spots, stains, and dirt from finished surfaces.
 - d. Sweep, vacuum, and hand-dust all areas, including concealed surfaces and overhead spaces, to remove all dust.
 - 3. Glass. Clean all glass inside and outside.
 - 4. Polished surfaces. To all surfaces requiring the routine application of buffed polish, apply the polish recommended by the manufacturer of the material being polished.

END OF SECTION

SECTION 01 75 00

FACILITY START-UP

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** The Contractor shall provide the labor, tools, equipment, and materials necessary to complete the general requirements for facility start-up and operation of subsystems, systems, and equipment. Start up, test, and operate the completed work including systems and equipment until substantial completion is achieved and the completed work including systems and equipment is accepted by the Owner. Contractor shall cooperate and coordinate with the Owner or Owner's Representative in the operation, maintenance, and adjustment of the work.

1.3 QUALITY ASSURANCE

Not used.

1.4 SUBMITTALS

- A. **Qualifications of Manufacturer's Representative.** Resumes of manufacturer's representatives stating qualifications and experience of individuals proposed for performing facility start-up shall be submitted to the Engineer/Architect for review at least 2 weeks prior to the scheduled date for facility start-up. The Owner and/or Engineer/Architect shall have the right to reject the use of an individual for facility start-up.
- B. **Manufacturer's Representative Reports**
1. The manufacturer's representative shall prepare a daily report on each site visit for each system or item of equipment inspected, adjusted, started up, or worked on. If a manufacturer's representative visits the site for equipment specified in several specification sections, a separate report shall be filed for each specification section.
 2. The report shall state the purpose of the visit, the representative's observations and conclusions, and recommendations for further visits or action. The manufacturer's representative shall maintain a log of the settings of all adjustable components. Initial settings shall be recorded and submitted on the first visit. During subsequent visits, the manufacturer's representative shall add the current or adjusted setting to the log.
 3. The reports shall be submitted within 48 hours of the visit.

1.5 JOB CONDITIONS

- A. **Facility Start-Up.** The series of activities necessary to bring a component, system, or unit process from installation to operational demonstration. Facility start-up includes but is not limited to field testing, dry testing, wet testing, performance testing, manufacturer's checkout, and start-up, ready for operational demonstrations. Requirements for testing, adjusting, and balancing are provided in Section 01 75 16. Requirements for operational demonstrations are provided in Section 01 79 01.
- B. **Start-Up.** Narrowly defined as placing a component, system, or unit process on-line.
- C. **Operational Demonstration.** An activity performed by the Contractor wherein the Contractor operates and maintains a fully functional component, system, or unit process for a period of time after facility start-up and stable operation have been achieved in conformance with Section 01 79 01.
- D. **Field Testing.** Testing performed on-site by the Contractor to satisfy requirements of the manufacturer and Contract Documents and in conformance with Section 01 75 16.
- E. **Manufacturer's Checkout.** Field inspection, testing, adjustments, and sign-off by the manufacturer's representative, indicating that the component, system, or unit process meets the manufacturer's requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

Not used.

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 EXAMINATION AND VERIFICATION OF CONDITIONS

- A. **Prior Inspections.** The Contractor shall inspect systems and equipment prior to each start-up and verify their readiness for start-up. Conditions hazardous to equipment or personnel shall be corrected by the Contractor prior to start-up of equipment.
 - 1. Start-up operations shall not proceed using temporary power or temporary instrumentation and control wiring unless approved by the Engineer/Architect. All electrical and control connections shall be permanent and complete, and all such electrical components and equipment fully functional.
 - 2. Use of repair parts during start-up operations shall not be permitted, except in such situations where the actual on-site verification of such repair parts' operability is specified.

3.2 PREPARATION

- A. **Test Equipment.** Prior to start-up of equipment or systems, all necessary test equipment shall be in place and operable.
- B. **Manufacturer at Site.** Manufacturer's representative(s) shall be present for the initial start-up of systems or equipment.
- C. **Permission and Notification.** The Contractor shall request permission to start up equipment, including electrical gear, and notify the Engineer/Architect of the start-up.
 - 1. The start-up request shall be submitted a minimum of 72 hours before the scheduled start-up. Requests shall be made during normal working hours.
 - 2. Approval of the request is based solely on impact on plant operations. Approval does not relieve the Contractor of any responsibility for plant and personnel safety.
- D. **Installation Checks.** Normal installation checks, such as for rotation, are not considered start-ups and do not require start-up notification. All electrical apparatus which is energized shall be clearly marked.

3.3 CONDUCT OF START-UP

- A. **Start-Up**
 - 1. All initial start-ups of equipment or systems so designated in the specifications shall be performed under the technical direction of the manufacturer's representative.
 - 2. Any lack of readiness of associated systems or failure of a system or equipment previously started prior to the date of final acceptance of the project shall require additional start-up service by the manufacturer to be performed.
 - 3. The Contractor shall repair, replace, or modify any equipment or system which fails to perform as specified in the individual sections of Divisions 2 through 44.
- B. **Available Knowledgeable Contractor Personnel.** When Owner personnel are operating systems or equipment, the Contractor shall make available, at all times, persons knowledgeable about the systems or equipment to direct the Owner personnel in its operation.
- C. **Adjustments and Corrections.** The Contractor shall make all adjustments and corrections necessary to achieve normal, stable operation of systems.
- D. **Failures and Corrections.** Any failures of equipment or systems operated under the direction of the Contractor shall be considered deficiencies and shall be corrected.
- E. **Plant Operations and Processes.** During the facility start-up and at other times, the work will be on-line and an integral part of the plant operations and process.

The Owner maintains control of treatment plant operations and processes at all times. Therefore:

1. The Contractor shall not commence, resume, terminate, or suspend the operations without the permission of the Owner and only in a sequence and manner suitable to the Owner.
2. The operation of the work shall be in strict accordance with the operational orders of the Owner.
3. The Contractor shall immediately, on a 24-hour-per-day, 7-day-per-week basis, adjust or repair any malfunction in the work which in the opinion of the Owner jeopardizes or may jeopardize the proper operation of the plant.
4. The Contractor shall not start up, shut down, adjust, or otherwise alter the operation of any component, system, or unit process without the permission of the Owner except in the case of an emergency.

END OF SECTION

SECTION 01 75 16

TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** This section includes general requirements for the conduct of testing, adjusting, and balancing. Testing, adjusting, and balancing shall be performed in accordance with recognized industry standards and as specified in individual sections of Divisions 2 through 44 of the specifications.

1.3 QUALITY ASSURANCE

Not used.

1.4 SUBMITTALS

- A. **General.** Test reports shall be submitted within 48 hours of the completion, suspension, or termination of the test unless otherwise approved. Test reports shall fully describe the test and results as well as settings of all adjustable components.

1.5 JOB CONDITIONS

- A. **General.** The requirements of this section are in addition to those specified by regulatory agencies. Except as specifically prohibited or modified by regulatory requirements, comply fully with all requirements of this section.

1.6 DELIVERY, STORAGE, AND HANDLING

Not used.

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. **General.** The Contractor shall supply all materials and equipment used in testing, adjusting, and balancing.

- B. **Materials and Equipment.** Materials and equipment used shall be of good quality and suitable for the intended service. The use of miscellaneous items found at the job site is not acceptable.
- C. **Range or Capacity.** Select range or capacity of test equipment to provide meaningful test results. Select pressure or differential pressure gauges so that test pressure is 50 percent to 75 percent of maximum gauge reading.

2.2 FABRICATION

- A. **Temporary Equipment.** The Contractor shall fabricate, as necessary, any temporary equipment used in testing.

2.3 SOURCE QUALITY CONTROL

- A. **Instrument Calibrations.** All instruments shall be calibrated to recognized standards by the instrument manufacturer or a qualified independent calibration laboratory. Retain instrument calibration data at the Contractor's site office for Owner or Owner's Representative's review.

2.4 TESTING DEFINITIONS

- A. **Dry Testing.** Dry testing is performed by the Contractor without introducing either process material or other test material into the component, system, or unit process.
- B. **Wet Testing.** Wet testing is performed by the Contractor utilizing test material in the component, system, or unit process. Process tankage shall be filled with test material to operating level.
- C. **Performance Testing.** Performance testing is performed by the Contractor to demonstrate system performance in accordance with specification requirements.

PART 3 - EXECUTION

3.1 EXAMINATION AND VERIFICATION OF CONDITIONS

- A. **Examination.** Review the design and installation of the system or equipment to ensure that the proposed test will not result in a hazard to personnel or equipment.
- B. **Verification.** Verify that the equipment, component, or system is completely and correctly installed before beginning tests.

3.2 PREPARATION

- A. **Prior Preparation.** Design, fabricate, and install test equipment before commencing the test.
- B. **Notification.** Notify and obtain approval of the Engineer/Architect prior to each test.

3.3 TESTING, ADJUSTING, AND BALANCING

A. Dry Testing

1. All equipment and systems shall be tested, adjusted, aligned, lubricated, and balanced in accordance with the manufacturer's instructions prior to testing.
2. Test individual components prior to testing the system of which they are a part.

B. Wet Testing

1. After dry testing, wet test all equipment and systems for a minimum of 72 hours under the design operating conditions utilizing a test material similar to or the same as the process material.
2. All costs, including materials and equipment, for delivery of the test material shall be at the Contractor's expense. Test each component or item of equipment to demonstrate compliance with the design criteria and operating range specified.
3. Suspend or secure all tests in the event that test failures or hazardous conditions occur. Make repairs, replacements, or adjustments and restart test in its entirety.
4. The Contractor shall dispose of the test material at no additional cost to the Owner.
5. The Contractor shall clean all equipment systems and structures upon conclusion of testing at no additional cost to the Owner.
6. Comply with any performance testing requirements specified.

3.4 FIELD QUALITY CONTROL

- A. **Presence of Engineer/Architect.** The Engineer/Architect or other Owner's Representative must be present during all wet testing; otherwise, the testing shall be repeated.
- B. **Failure.** Tests shall be repeated if results of testing fail to meet test criteria, whether the failure is identified in the field at the time of testing or through test report review.

END OF SECTION

SECTION 01 78 23

MAINTENANCE AND OPERATING INSTRUCTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** The Contractor shall prepare and furnish Maintenance and Operating Instructions for installation, maintenance, and operation of all equipment and associated subsystems and systems as specifically required in Divisions 2 through 46.

1.3 QUALITY ASSURANCE

Not used.

1.4 SUBMITTALS

- A. **General.** The Contractor shall initially submit one copy of the maintenance and operating instructions for review. After approval of the review copy, six copies of the revised instructions shall then be submitted. Each copy shall be bound in an appropriately sized three ring notebook with a cover designating the name of equipment, maintenance, and specification section number. Maintenance and operating instructions for each specification section shall be bound in a separate notebook. Six copies of any revisions shall be submitted for insertion in the notebooks.

1.5 JOB CONDITIONS

Not used.

1.6 DELIVERY, STORAGE, AND HANDLING

Not used.

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

- 2.1 **GENERAL REQUIREMENTS.** Maintenance and Operating Instructions shall include all of the following:
- A. **Manufacturer's Data.** Include general descriptive bulletins, brochures, or catalog sheets used to describe the equipment.
 - B. **Operating Instructions/Operating Sequence Descriptions.** These shall be complete, detailed written descriptions of the operating sequence of all control systems and operations in all modes. The descriptions shall be specifically prepared for this work and shall be fully referenced to control diagrams and system components. The descriptions shall include start-up and shutdown operations under manual, system safety functions.
 - C. **Manufacturer's Instructions.** This shall include instructions for storage, installation, routine preventive maintenance, and lubrication. This data shall include instructions that describe the proper procedures for moving, supporting, and anchoring of equipment, including tolerances for settings and adjustment. Also included shall be the storage requirements and procedures to protect products prior to installation, and once installed, prior to start-up/periods of prolonged shutdown, and proper storage of repair parts.
 - D. **Parts List.** Include assembly, exploded view illustrations, or sectional drawings with all parts identified. Part listings shall include descriptions, quantity (per assembly) required, and original equipment manufacturer's part numbers.
 - E. **Supplier Data.** Provide addresses, telephone numbers, and names of contact persons for the equipment manufacturer and manufacturer's representative. Include both regional (local) and home offices.
 - F. **Warranties and Guarantees.** Include terms and conditions of the warranty. Include the manufacturer's express warranty and any special express warranties as specified in individual sections of Divisions 2 through 46 of the Project Manual in addition to the general warranty. Draft warranties shall be submitted with the shop drawing submittals. Final warranties will become effective on the date of substantial completion applicable to the named equipment. Copies of the approved draft warranties are to be included in the initial Maintenance and Operating Instructions submittal. Following substantial completion, copies of the executed final warranties shall be provided for insertion into the final Maintenance and Operating Instructions.
 - G. **Approved Submittals.** Provide a complete list (including submittal numbers) of all approved submittals pertaining to the Maintenance and Operating Instructions.
 - H. **Copies** of all materials shipped with the equipment.
 - I. **Copies** of all approval submittals including control wiring diagrams.

2.2 **DEPOT LEVEL INSTRUCTIONS.** Individual sections of Divisions 2 through 46 of the Project Manual require that Depot Level information be submitted as part of the initial Maintenance and Operating Instructions. Depot level instructions are detailed instructions that would be used by the manufacturer's factory, repair depot, or authorized service center to repair or rebuild an item of equipment or a component, part, or subassembly of an item of equipment deemed by the manufacturer as "not user serviceable." These instructions will be used for both ordinary and major maintenance, and enable the Owner to overhaul or repair equipment in the event parts become unavailable. The following is a list of depot level instructions that are specifically required by individual sections:

- A. **Detailed Parts Lists.** In addition to original equipment manufacturer's parts numbers, provide complete part descriptions, sizes, and materials of construction types and/or grades using appropriate industry standard designation codes. Provide universal part numbers for applicable items such as bearings, seals, and gaskets.
- B. **Repair Data.** Include instructions for assembly, disassembly, rebuilding, and repair of the equipment or component.
- C. **Manufacturing Data.** Scale drawings and supplementary information with complete dimensions, tolerances, finishes, features, materials, and treatments required for procurement of materials and manufacture of the part(s) or equipment.
- D. **Electrical Diagrams.** Schematic diagrams, wiring diagrams, point-to-point wiring diagrams, and logic flow diagrams.
- E. **Mechanical Diagrams.** Schematic diagrams of pneumatic, hydraulic, and other mechanical systems and piping.
- F. **Troubleshooting Data.** Include procedures, forms, or checklists, outlines, and diagnostic aids and information.
- G. **Test Data.** Include procedures, readings, and settings for testing and calibration.
- H. **Repair Parts and Maintenance Materials.** List replacement parts, special tools, and consumable materials used in cleaning, maintenance, and repair.
- I. **Software/Programming Documentation.** This documentation shall be referenced to the Operating Sequence Descriptions and shall include flow charts, program source code listings, and documentation ladder diagrams with detailed descriptions for each rung for the software provided. Information shall be provided to instruct and to familiarize the operator and shall be reviewed with the system programming to enable a step-by-step evaluation of the program. Notations, remarks, and labeling shall be provided on the program source code listing to indicate the program operation and function. Any additional narrative description of the program operation shall be provided to fully describe the system parameters and functionality in a clear and logical manner.

- 2.3 **OTHER INSTRUCTIONS.** Submit additional information as required by individual sections of Divisions 2 through 46 of the specifications.

PART 3 - EXECUTION

3.1 VERIFICATION

- A. **General.** The Contractor shall verify the accuracy of Maintenance and Operation Instructions by visual and physical inspection of the installed equipment. The Contractor shall:
1. Perform field verification in the presence of the Owner or Owner's Representative.
 2. Notify Engineers 1 week before the scheduled field verification. The Engineer/Architect may require changes in the field verification schedule.
 3. Physically trace and document as required all wiring and piping.
 4. Visually inspect equipment and components and compare configurations and nameplate information to Maintenance and Operating Instructions.
 5. Submit any changes, additions, or deletions to the Maintenance and Operating Instructions identified during field verification.
 6. In the event changes are made to the equipment following field verification, the Contractor shall submit a final supplement of approved revisions of the Maintenance and Operating Instructions.

- 3.2 **SHIPPED INSTRUCTIONS.** Within 2 weeks of equipment delivery, submit copies of maintenance, operation, and installation instructions shipped with the equipment.

END OF SECTION

SECTION 01 78 40

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and General provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** The Contractor shall provide the labor, tools, equipment, and materials necessary to maintain and provide the Owner with Project Record Documents.

1.3 QUALITY ASSURANCE (Not used.)

1.4 SUBMITTALS

- A. **Project Record Documents.** The Contractor shall submit project record documents, as follows:
1. The Contractor shall submit one set of the Contract Drawings with each sheet labeled "Project Record" and updated as specified.
 2. The Contractor shall submit one copy of other contract documents with the cover labeled "Project Record" and updated as specified.
 3. The Contractor shall submit one copy of each Record Shop Drawing with each sheet labeled "Project Record" and updated as specified.
 4. These requirements for Record Project Documents are in addition to the requirements for the Maintenance and Operating Instructions.

1.5 JOB CONDITIONS (Not used.)

1.6 DELIVERY, STORAGE, AND HANDLING (Not used.)

1.7 SPECIAL WARRANTY (Not used.)

PART 2 - PRODUCTS (Not applicable.)

PART 3 - EXECUTION

3.1 EXAMINATION AND VERIFICATION

- A. **Maintenance of Documents.** Maintain in Contractor's field office in clean, dry, legible condition the following: contract drawings, specifications, conforming shop drawings, contract modifications, other modifications of contract, test records, survey data, and all other documents pertinent to Contractor's work.

- B. **Files.** Provide files and racks for proper storage and easy access. File in accordance with filing format acceptable to Engineer/Architect.
- C. **Availability.** Make documents available at all times for inspection by Engineer/Architect.
- D. **Purpose.** Project Record Documents shall not be used for any other purpose and shall not be removed without Engineer/Architect's approval.

3.2 INSTALLATION

- A. **Recording Procedure.** Do not permanently conceal any work until required information has been recorded and Engineer/Architect has been given sufficient time to inspect all work.
- B. **Update as Construction Proceeds.** Keep all Project Record Documents updated to record construction as actually built and to document all approved changes to the documents. This update information shall include but is not necessarily limited to the following:
 - 1. Contract Drawings. Legibly mark to record actual construction including:
 - a. Depths of various elements of foundation in relation to datum.
 - b. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
 - c. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
 - d. Field changes of dimension and detail.
 - e. Changes made by Change Order or Field Order.
 - 2. Specifications. Legibly mark up each section to record
 - a. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually incorporated into the work.
 - b. Changes made by Change Order or Field Order.
 - 3. Submittals. Prepare and submit one copy of all submittals for the work performed under this Contract. These submittals shall be updated as outlined above. Submittals shall be in legal files with the specification section and title marked on the tab.

END OF SECTION

SECTION 01 86 01

BASIC MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to this and the other sections of Divisions 22 and 23.
- B. **Related Sections.** The following sections contain requirements that relate to this section:
 - 1. Section 01 86 02, "Electrical Requirements for Mechanical Equipment," for factory-installed motors, controllers, accessories, and connections.
 - 2. Section 01 86 03, "Basic Mechanical Materials and Methods," for materials and methods common to Divisions 22 and 23, plus general related specifications including:
 - a. Access to mechanical installations.
 - b. Excavation for mechanical installations within the building boundaries, and from building to utilities connections.
 - 3. Sections 23 09 00 and 23 09 93, "Instrumentation and Controls" and "Sequence of Operation," for controls and interlocks.

1.2 DESCRIPTION OF WORK

- A. **General.** The Contractor shall provide the labor, tools, equipment, and materials necessary to construct the project in accordance with the plans and as specified herein.
 - 1. Controls, interlocks, and their wiring systems are work of Division 23.
- B. **This section includes general administrative** and procedural requirements for mechanical installations. The following administrative and procedural requirements are included in this section to expand the requirements specified in Division 1:
 - 1. Submittals.
 - 2. Coordination drawings.
 - 3. Record documents.
 - 4. Maintenance manuals.
 - 5. Rough-ins.
 - 6. Mechanical installations.
 - 7. Cutting and patching.

1.3 QUALITY ASSURANCE

- A. **Codes and Standards.** Perform all work in compliance with applicable requirements of governing agencies having jurisdiction and in accordance with these plans and as specified herein.

1.4 SUBMITTALS

- A. **Transmittals.** Furnish manufacturer's product data. Furnish test reports and material certifications where required by the sections in Divisions 22 and 23.
- B. **Follow the procedures specified** in Division 1 section "Submittals."
- C. **Quantity.** Increase, by the quantity listed below, the number of mechanical related shop drawings, product data, and samples submitted, to allow for required distribution.
 - 1. Shop Drawings - Initial Submittal. One additional blue or black line prints.
 - 2. Shop Drawings - Final Submittal. One additional blue or black line prints.
 - 3. Product Data. One additional copy of each item.
 - 4. Samples. One addition as set.
- D. **Additional Copies.** Additional copies may be required by individual sections of these specifications.

1.5 JOB CONDITIONS

Not used.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. **Delivery.** Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

1.7 SPECIAL WARRANTY

Not used.

1.8 COORDINATION DRAWINGS

- A. **Coordination drawings** are required for the following buildings:
 - 1. Collection Maintenance
 - 2. Laboratory
 - 3. Secondary Operations

- B. **General.** Prepare coordination drawings in accordance with Section 01 33 00 "Submittals," to a scale of 3/8"=1'-0" or larger; detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the work, including (but not necessarily limited to) the following:
1. Indicate the proposed locations of piping, ductwork, equipment, and materials. Include the following:
 - a. Clearances for installing and maintaining insulation.
 - b. Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.
 - c. Equipment connections and support details.
 - d. Exterior wall and foundation penetrations.
 - e. Fire rated wall and floor penetrations.
 - f. Sizes and location of required concrete pads and bases.
 - g. Valve stem movement.
 2. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
 3. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
 4. Prepare reflected ceiling plans to coordinate and integrate installations, air outlets and inlets, light fixtures, communication systems components, sprinklers, and other ceiling mounted items.

1.9 RECORD DOCUMENTS

- A. **General.** Prepare record documents in accordance with the requirements in Section 01 78 40, "Project Record Documents." In addition to the requirements specified in Division 1, indicate the following installed conditions:
1. Ductwork mains and branches, size and location, for both exterior and interior; locations of dampers and other control devices; filters, boxes, and terminal units requiring periodic maintenance or repair.
 2. Mains and branches of piping systems, with valves and control devices located and numbered, concealed unions located, and with items requiring maintenance located (i.e., traps, strainers, expansion compensators, tanks, etc.). Valve location diagrams, complete with valve tag chart. Refer to Section 22 05 53, "Mechanical Identification." Indicate actual inverts and horizontal locations of underground piping.
 3. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
 4. Approved substitutions, contract modifications, and actual equipment and materials installed.
 5. Contract modifications, actual equipment and materials installed.

- B. **Invert Elevations.** Engage the services of a Land Surveyor or Professional Engineer registered in the state in which the project is located to record the locations and invert elevations of underground installations.

1.10 MAINTENANCE MANUALS

- A. **General.** Prepare maintenance manuals in accordance with Section 01 78 00, "Project Closeout." In addition to the requirements specified in Division 1, include the following information for equipment items:
 1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
 2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions. Clearly mark applicable portions of manufacturer's literature and cross out all information not pertinent to products provided.
 3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
 4. Servicing instructions and lubrication charts and schedules.
 5. Provide tabbed sections for each item of equipment and a table of contents for each tabbed section.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. **Rough-in Measurements.** Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
- B. **Location of Requirements.** Refer to equipment specifications in Divisions 2 through 16 for rough-in requirements.

3.2 PREPARATION

- A. **General.** Sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:
 1. Coordinate mechanical systems, equipment, and materials installation with other building components.
 2. Verify all dimensions by field measurements.
 3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for mechanical installations.

4. Coordinate the installation of supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
5. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the work. Give particular attention to large equipment requiring positioning prior to closing in the building.
6. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
7. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.

3.3 ERECTION/INSTALLATION/APPLICATION

- A. **General.** Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Engineer/Architect.
- B. **Orientation.** Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
- C. **Location.** Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.
- D. **Access Panels.** Install access panel or doors where units are concealed behind finished surfaces. Access panels and doors are specified in Section 01 86 03, "Basic Mechanical Materials and Methods."
- E. **Conflicts.** Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.
- F. **Cutting and Patching**
 1. **General.** Perform cutting and patching in accordance with Section 01 73 29, "Cutting and Patching." In addition to the requirements specified in Division 1, the following requirements apply:
 - a. **Protection of Installed Work.** During cutting and patching operations, protect adjacent installations.
 2. **Examples.** Perform cutting, fitting, and patching of mechanical equipment and materials required to:
 - a. Uncover work to provide for installation of ill timed work.
 - b. Remove and replace defective work.

- c. Remove and replace work not conforming to requirements of the Contract Documents.
 - d. Remove samples of installed work as specified for testing.
 - e. Install equipment and materials in existing structures.
 - f. Upon written instructions from the Engineer/Architect, uncover and restore work to provide for Engineer/Architect observation of concealed work.
3. Removal of Existing Work. Cut, remove and legally dispose of selected mechanical equipment, components, and materials as indicated, including but not limited to removal of mechanical piping, heating units, plumbing fixtures and trim, and other mechanical items made obsolete by the new work.

3.4 PROTECTION

- A. **Protect Remaining Work.** Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.
- B. **Dust Protection.** Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.
1. Patch existing finished surfaces and building components using new materials matching existing materials and experienced installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.
 2. Patch finished surfaces and building components using new materials specified for the original installation and experienced installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

END OF SECTION

SECTION 01 86 03

BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to this section.
- B. **Related Sections.** Requirements specified in Section 01 86 01 "Basic Mechanical Requirements" apply to this section.

1.2 DESCRIPTION OF WORK

- A. **General.** The Contractor shall provide the labor, tools, equipment, and materials necessary to construct the project in accordance with the plans and as specified herein.
- B. **This section includes limited-scope general** construction materials and methods for application with mechanical installations as follows:
- C. **Nameplates.** Mechanical equipment nameplate data.
- D. **Demolition.** Selective demolition including:
 - 1. Nondestructive removal of materials and equipment for reuse or salvage as indicated.
 - 2. Dismantling mechanical materials and equipment made obsolete by these installations.
- E. **Excavation.** For underground utilities and services, including underground piping (under the building and from building to utility connection), tanks, basins, and equipment.
- F. **Miscellaneous Metals.** For support of mechanical materials and equipment.
- G. **Miscellaneous Lumber.** Wood grounds, nailers, blocking, fasteners, and anchorage for support of mechanical materials and equipment.
- H. **Joint Sealers.** For sealing around mechanical materials and equipment; and for sealing penetrations in fire and smoke barriers, floors, and foundation walls.
- I. **Access Panels.** Access panels and doors in walls, ceilings, and floors for access to mechanical materials and equipment.

1.3 QUALITY ASSURANCE

- A. **Codes and Standards.** Perform all work in compliance with applicable requirements of governing agencies having jurisdiction and in accordance with these plans and as specified herein.
- B. **Installer Qualifications.** Engage an experienced installer for the installation and application of joint sealers, access panels, and doors.
- C. **Welding.** Qualify welding processes and welding operators in accordance with American Welding Society (AWS) D1.1 "Structural Welding Code - Steel."
 - 1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.
- D. **Fire Resistance Ratings.** Where a fire resistance classification is indicated, provide access door assembly with panel door, frame, hinge, and latch from manufacturer listed in the Underwriters' Laboratories, Inc. (UL) "Building Materials Directory" for rating shown.
 - 1. Provide UL label on each fire rated access door.

1.4 SUBMITTALS

- A. **Transmittals.** Furnish manufacturer's product data, test reports, and material certifications as required.
- B. **Submit the following** in accordance with Conditions of Contract and Division 1 specification sections.
 - 1. Product data for the following products:
 - a. Access panels and doors.
 - b. Joint sealers.
 - 2. Shop drawings detailing fabrication and installation for metal fabrications, and wood supports and anchorage for mechanical materials and equipment.
 - 3. Coordination drawings for access panel and door locations in accordance with Section 01 86 01, "Basic Mechanical Requirements."
 - 4. Samples of joint sealer, consisting of strips of actual products showing full range of colors available for each product.
 - 5. Schedules indicating proposed methods and sequence of operations for selective demolition prior to commencement of work. Include coordination for shutoff of utility services and details for dust and noise control.

- a. Coordinate sequencing with construction phasing and Owner occupancy specified in Section 01 14 01, "Work Restrictions."
6. Chart, certified by the Contractor, indicating the percentage of anti-freeze by volume, corresponding protection in degrees Fahrenheit, and date of fill.

1.5 JOB CONDITIONS

- A. **Conditions Affecting Selective Demolition.** The following project conditions apply:
 1. Protect adjacent materials indicated to remain. Install and maintain dust and noise barriers to keep dirt, dust, and noise from being transmitted to adjacent areas. Remove protection and barriers after demolition operations are complete.
 2. Locate, identify, and protect mechanical services passing through demolition area and serving other areas outside the demolition limits. Maintain services to areas outside demolition limits. When services must be interrupted, install temporary services for affected areas.
- B. **Conditions Affecting Excavations.** The following project conditions apply:
 1. Maintain and protect existing building services which transit the area affected by selective demolition.
 2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by excavation operations.
 3. Site Information. Subsurface conditions were investigated during the design of the project. Reports of these investigations are available for information only; data in the reports are not intended as representations or warranties of accuracy or continuity of conditions. The Owner will not be responsible for interpretations or conclusions drawn from this information.
 4. Existing Utilities. Locate existing underground utilities in excavation areas. If utilities are indicated to remain, support and protect services during excavation operations.
 5. Remove existing underground utilities indicated to be removed.
 - a. Uncharted or Incorrectly Charted Utilities. Contact utility owner immediately for instructions.
 - b. Provide temporary utility services to affected areas. Provide minimum of 48 hour notice to Engineer/Architect prior to utility interruption.
 6. Use of explosives is not permitted.

- C. **Environmental Conditions.** Apply joint sealers under temperature and humidity conditions within the limits permitted by the joint sealer manufacturer. Do not apply joint sealers to wet substrates.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. **Delivery.** Deliver joint sealer materials in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multiple-component materials.
- B. **Storage.** Store and handle joint sealer materials in compliance with the manufacturers' recommendations to prevent their deterioration and damage.

1.7 SPECIAL WARRANTY

Not used.

1.8 SEQUENCE AND SCHEDULING

- A. **Coordinate the shutoff and disconnection** of utility services with the Owner and the utility company.
- B. **Notify the Engineer/Architect** at least 5 days prior to commencing demolition operations.
- C. **Perform demolition in phases** as indicated.

1.9 DEFINITIONS. The following definitions apply to excavation operations:

- A. **Additional Excavation.** Where excavation has reached required subgrade elevations, if unsuitable bearing materials are encountered, continue excavation until suitable bearing materials are reached. The Contract Sum may be adjusted by an appropriate Contract Modification.
- B. **Subbase.** As used in this section refers to the compacted soil layer used in pavement systems between the subgrade and the pavement base course material.
- C. **Subgrade.** As used in this section refers to the compacted soil immediately below the slab or pavement system.
- D. **Unauthorized Excavation.** Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction from the Engineer/Architect.

PART 2 - PRODUCTS

2.1 PRODUCTS/MATERIALS

- A. **Joint Sealers.** Joint sealers, joint fillers, and other related materials compatible with each other and with joint substrates under conditions of service and application.
1. Colors. As selected by the Engineer/Architect from manufacturer's standard colors.
 2. Elastomeric Joint Sealers. Provide the following types:
 - a. One part, nonacid curing, silicone sealant complying with ASTM C 920, Type S, Grade NS, Class 25, for uses in nontraffic areas for masonry, glass, aluminum, and other substrates recommended by the sealant manufacturer.
 - b. One part, mildew resistant, silicone sealant complying with ASTM C 920, Type S, Grade NS, Class 25, for uses in nontraffic areas for glass, aluminum, and nonporous joint substrates; formulated with fungicide; intended for sealing interior joints with nonporous substrates; and subject to in service exposure to conditions of high humidity and temperature extremes.
 - c. Available Products. Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following.
 - d. Products. Subject to compliance with requirements, provide one of the following:
 - 1) One-Part, Nonacid-Curing, Silicone Sealant.
 - a) Dow Corning 790, Dow Corning Corp.
 - b) Silglaze N SCS 2501, General Electric Co.
 - c) Silpruf SCS 2000, General Electric Co.
 - d) 864, Pecora Corp.
 - e) Rhodorsil 5C, Rhone-Poulenc, Inc.
 - f) Spectrum 1, Tremco, Inc.
 - g) Spectrum 2, Tremco, Inc.
 - h) Dow Corning 795, Dow Corning Corp.
 - i) Rhodorsil 6B, Rhone-Poulenc, Inc.
 - j) Rhodorsil 70, Rhone-Poulenc, Inc.
 - k) Omniseal, Sonneborn Building Products Div.

- 2) One-Part, Mildew-Resistant, Silicone Sealant.
 - a) Dow Corning 786, Dow Corning Corp.
 - b) SCS 1702 Sanitary, General Electric Co.
 - c) 863 #345 White, Pecora Corp.
 - d) Rhodorsil 6B White, Rhone-Poulenc, Inc.
 - e) Proglaze White, Tremco Corp.
 - f) OmniPlus, Sonneborn Building Products Div.

3. Acrylic Emulsion Sealants. One part, nonsag, mildew resistant, paintable complying with ASTM C 834 recommended for exposed applications on interior and protected exterior locations involving joint movement of not more than ± 5 percent.
 - a. Products. Subject to compliance with requirements, provide one of the following:
 - 1) AC-20, Pecora Corp.
 - 2) Sonolac, Sonneborn Building Products Div.
 - 3) Tremco Acrylic Latex 834, Tremco, Inc.

4. Fire-Resistant Joint Sealers. Two-part, foamed-in-place, silicone sealant formulated for use in through penetration fire stopping around cables, conduit, pipes, and duct penetrations through fire rated walls and floors. Sealants and accessories shall have fire resistance ratings indicated, as established by testing identical assemblies in accordance with ASTM E 814, by UL, or other testing and inspection agency acceptable to authorities having jurisdiction.
 - a. Products. Subject to compliance with requirements, provide one of the following:
 - 1) Dow Corning Fire Stop Foam, Dow Corning Corp.
 - 2) Pensil 851, General Electric Co.
 - 3) INSTA-FIRE SEAL, INSTA-Foam Products, Inc.

B. Access Doors

1. Steel Access Doors and Frames. Factory-fabricated and assembled units, complete with attachment devices and fasteners ready for installation. Joints and seams shall be continuously welded steel, with welds ground smooth and flush with adjacent surfaces.
2. Frames. 16-gauge steel, with a 1-inch-wide exposed perimeter flange for units installed in unit masonry, precast, or cast-in-place concrete, ceramic tile, or wood paneling.
 - a. For installation in masonry, concrete, ceramic tile, or wood paneling. 1-inch-wide exposed perimeter flange and adjustable metal masonry anchors.

- b. For gypsum wallboard or plaster. Perforated flanges with wallboard bead.
 - c. For full bed plaster applications. Galvanized expanded metal lath and exposed casing bead, welded to perimeter of frame.
3. Flush Panel Doors. 14-gauge sheet steel, with concealed spring hinges or concealed continuous piano hinge set to open 175 degrees; factory-applied prime paint.
 4. Fire-Rated Units. Insulated flush panel doors, with continuous piano hinge and self-closing mechanism.
 5. Locking Devices. Flush, screwdriver operated cam locks.
 6. Manufacturers. Subject to compliance with requirements, provide products by one of the following:
 - a. Bar-Co., Inc.
 - b. J.L. Industries.
 - c. Karp Associates, Inc.
 - d. Milcor Div. Inryco, Inc.
 - e. Nystrom, Inc.

2.2 COMPONENTS

A. Mechanical Equipment Nameplate Data

1. Nameplate. For each piece of power operated mechanical equipment provide a permanent operational data nameplate indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data. Locate nameplates in an accessible location.

B. Soil Materials

1. Subbase Material. Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, or natural or crushed sand.
2. Drainage Fill. Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100 percent passing a 1-1/2-inch sieve, and not more than 5 percent passing a No. 4 sieve.
3. Backfill and Fill Materials. Materials complying with American Society for Testing and Materials (ASTM) D 2487 soil classification groups GW, GP, GM, SM, SW, and SP; free of clay, rock, or gravel larger than 2 inches in any dimension; debris; waste; frozen materials; and vegetable and other deleterious matter.

C. Miscellaneous Metals

1. Steel Plates, Shapes, Bars, and Bar Grating. ASTM A 36.
2. Cold Formed Steel Tubing. ASTM A 500.
3. Hot Rolled Steel Tubing. ASTM A 501.
4. Steel Pipe. ASTM A 53, Schedule 40, welded.
5. Nonshrink, Nonmetallic Grout. Premixed, factory packaged, nonstaining, noncorrosive, nongaseous grout, recommended for interior and exterior applications.
6. Fasteners. Zinc coated, type, grade, and class as required.

D. Miscellaneous Lumber

1. Framing Materials. Standard Grade, light framing size lumber of any species. Number 3 Common or Standard Grade boards complying with West Coast Lumber Inspection Bureau (WCLIB) or American Wood Preservers Association (AWPA) rules, or Number 3 boards complying with Southern Pine Inspection Bureau (SPIB) rules. Lumber shall be preservative treated in accordance with American Wood Preservers Bureau (AWPB) LP-2, and kiln dried to a moisture content of not more than 19 percent.
2. Construction Panels. Plywood panels; American Plywood Association (APA) C-D PLUGGED INT, with exterior glue; thickness as indicated, or if not indicated, not less than 15/32 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. **Unsatisfactory Conditions.** Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances and other conditions affecting installation and application of joint sealers and access panels. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. **Surface Cleaning for Joint Sealers.** Clean surfaces of joints immediately before applying joint sealers to comply with recommendations of joint sealer manufacturer.
- B. **Primer.** Apply joint sealer primer to substrates as recommended by joint sealer manufacturer. Protect adjacent areas from spillage and migration of primers, using masking tape. Remove tape immediately after tooling without disturbing joint seal.

3.3 SELECTIVE DEMOLITION

- A. **General.** Demolish, remove, demount, and disconnect abandoned mechanical materials and equipment indicated to be removed and not indicated to be salvaged or saved.

- B. **Materials and Equipment To Be Salvaged.** Remove, demount, and disconnect existing mechanical materials and equipment indicated to be removed and salvaged, and deliver materials and equipment to the (location designated for storage).
- C. **Disposal and Cleanup.** Remove from the site and legally dispose of demolished materials and equipment not indicated to be salvaged.
- D. **Mechanical Materials and Equipment.** Demolish, remove, demount, and disconnect the following items:
 - 1. Inactive and obsolete piping, fittings and specialties, equipment, ductwork, controls, fixtures, and insulation.
 - a. Piping and ducts embedded in floors, walls, and ceilings may remain if such materials do not interfere with new installations. Remove materials above accessible ceilings. Drain and cap piping and ducts allowed to remain.
 - 2. Perform cutting and patching required for demolition in accordance with Section 01 73 29 "Cutting and Patching."

3.4 EXCAVATION

- A. **General.** Slope sides of excavations to comply with local codes and ordinances. Shore and brace as required for stability of excavation.
- B. **Shoring and Bracing.** Establish requirements for trench shoring and bracing to comply with local codes and authorities. Maintain shoring and bracing in excavations regardless of time period excavations will be open.
 - 1. Remove shoring and bracing when no longer required. Where sheeting is allowed to remain, cut top of sheeting at an elevation of 30 inches below finished grade elevation.
- C. **Erosion Control.** Install sediment and erosion control measures in accordance with local codes and ordinances.
- D. **Dewatering.** Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area.
 - 1. Do not allow water to accumulate in excavations. Remove water to prevent softening of bearing materials. Provide and maintain dewatering system components necessary to convey water away from excavations.
 - 2. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey surface water to collecting or runoff areas. Do not use trench excavations as temporary drainage ditches.
- E. **Material Storage.** Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade, and shape stockpiles for proper drainage.

1. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.
2. Remove and legally dispose of excess excavated materials and materials not acceptable for use as backfill or fill.

F. **Excavation for Underground Tanks, Basins, and Mechanical Structures.**

Conform to elevations and dimensions shown within a tolerance of ± 0.10 foot; plus a sufficient distance to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.

1. Excavate, by hand, areas within drip line of large trees. Protect the root system from damage and dry out. Maintain moist conditions for root system and cover exposed roots with burlap. Paint root cuts of 1 inch in diameter and larger with emulsified asphalt tree paint.
2. Take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed.

G. **Trenching.** Excavate trenches for mechanical installations as follows:

1. Excavate trenches to the uniform width, sufficiently wide to provide ample working room and a minimum of 6 to 9 inches clearance on both sides of pipe and equipment.
2. Excavate trenches to depth indicated or required for piping to establish indicated slope and invert elevations. Beyond building perimeter, excavate trenches to an elevation below frost line.
3. Limit the length of open trench to that in which pipe can be installed, tested, and the trench backfilled within the same day.
4. Where rock is encountered, carry excavation below required elevation and backfill with a layer of crushed stone or gravel prior to installation of pipe. Provide a minimum of 6 inches of stone or gravel cushion between rock bearing surface and pipe.
5. Excavate trenches for piping and equipment with bottoms of trench to accurate elevations for support of pipe and equipment on undisturbed soil.
 - a. For pipes or equipment 6 inches or larger in nominal size, shape bottom of trench to fit bottom 1/4 of the circumference. Fill unevenness with tamped sand backfill. At each pipe joint over excavate to relieve the bell or pipe joint of the pipe of loads, and to ensure continuous bearing of the pipe barrel on the bearing surface.

H. **Cold Weather Protection.** Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees Fahrenheit ($^{\circ}$ F.).

I. **Backfilling and Filling.** Place soil materials in layers to required subgrade elevations for each area classification listed below, using materials specified in Part 2 of this section.

1. Under walks and pavements, use a combination of subbase materials and excavated or borrowed materials.
 2. Under building slabs, use drainage fill materials.
 3. Under piping and equipment, use subbase materials where required over rock bearing surface and for correction of unauthorized excavation.
 4. For piping less than 30 inches below surface of roadways, provide 4 inch thick concrete base slab support. After installation and testing of piping, provide a 4 inch thick concrete encasement (sides and top) prior to backfilling and placement of roadway subbase.
 5. Other areas, use excavated or borrowed materials.
- J. **Backfill Sequencing.** Backfill excavations as promptly as work permits, but not until completion of the following:
1. Inspection, testing, approval, and locations of underground utilities have been recorded.
 2. Removal of concrete formwork.
 3. Removal of shoring and bracing, and backfilling of voids.
 4. Removal of trash and debris.
- K. **Placement and Compaction.** Place backfill and fill materials in layers of not more than 8 inches in loose depth for material compacted by heavy equipment, and not more than 4 inches in loose depth for material compacted by hand operated tampers.
- L. **Moisture Content.** Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification specified below. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
- M. **Structures and Piping.** Place backfill and fill materials evenly adjacent to structures, piping, and equipment to required elevations. Prevent displacement of piping and equipment by carrying material uniformly around them to approximately same elevation in each lift.
- N. **Compaction.** Control soil compaction during construction, providing minimum percentage of density specified for each area classification indicated below.
1. Percentage of Maximum Density Requirements. Compact soil to not less than the following percentages of maximum density for soils which exhibit a well defined moisture density relationship (cohesive soils), determined in accordance with ASTM D 1557 and not less than the following percentages of relative density, determined in accordance with ASTM D 2049, for soils which will not exhibit a well defined moisture density relationship (cohesionless soils).
 - a. Areas Under Structures, Building Slabs and Steps, Pavements. Compact top 12 inches of subgrade and each layer of backfill or fill material to 90 percent maximum density for cohesive material, or 95 percent relative density for cohesionless material.

- b. Areas Under Walkways. Compact top 6 inches of subgrade and each layer of backfill or fill material to 90 percent maximum density for cohesive material, or 95 percent relative density for cohesionless material.
 - c. Other Areas. Compact top 6 inches of subgrade and each layer of backfill or fill material to 85 percent maximum density for cohesive soils, and 90 percent relative density for cohesionless soils.
2. Moisture Control. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water. Apply water in minimum quantity necessary to achieve required moisture content and to prevent water appearing on surface during, or subsequent to, compaction operations.
- O. **Subsidence.** Where subsidence occurs at mechanical installation excavations during the period 12 months after Substantial Completion, remove surface treatment (i.e., pavement, lawn, or other finish), add backfill material, compact to specified conditions, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent areas.

3.5 ERECTION/INSTALLATION/APPLICATION

- A. **Metal Supports.** Cut, fit, and place miscellaneous metal fabrications accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.
- B. **Field Welding.** Comply with AWS "Structural Welding Code."
- C. **Wood Supports.** Cut, fit, and place wood grounds, nailers, blocking, and anchorage accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.
- D. **Fasteners.** Select fastener sizes that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood members.
- E. **Attachment.** Attach to substrates as required to support applied loads.
- F. **Joint Sealers.** Comply with joint sealer manufacturers' printed application instructions applicable to products and applications indicated, except where more stringent requirements apply.
 - 1. Comply with recommendations of ASTM C 962 for use of elastomeric joint sealants.
 - 2. Comply with recommendations of ASTM C 790 for use of acrylic emulsion joint sealants.
 - a. Tooling. Immediately after sealant application and prior to time shinning or curing begins, tool sealants to form smooth, uniform

beads; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

- b. Installation of Fire Stopping Sealant. Install sealant, including forming, packing, and other accessory materials, to fill openings around mechanical services penetrating floors and walls, to provide fire stops with fire resistance ratings indicated for floor or wall assembly in which penetration occurs. Comply with installation requirements established by testing and inspecting agency.

G. Access Doors

1. Frames. Set frames accurately in position and securely attached to supports, with face panels plumb and level in relation to adjacent finish surfaces.
2. Adjustment. Adjust hardware and panels after installation for proper operation.

END OF SECTION

SECTION 01 89 19

LEAKAGE TEST AND DISINFECTION

PART 1 - GENERAL

- 1.1 **RELATED DOCUMENTS.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.
- 1.2 **DESCRIPTION OF WORK.** Provide the labor, tools, equipment, and materials necessary to perform the leakage tests and disinfection of pipes, equipment, and tanks in accordance with the drawings and the specifications.
- 1.3 **QUALITY ASSURANCE.** Materials and workmanship shall be in accordance with the following standards as referenced herein:
- A. **AWWA.** American Water Works Association.
 - B. **ASTM.** American Society for Testing and Materials.
 - C. **ACI.** American Concrete Institute.
- 1.4 **SUBMITTALS**
- A. **Test Reports.** Submit test results of all testing included in this section including, but not limited to, the following:
 - 1. Pressure tests.
 - 2. Tests for efficacy of disinfection.
- 1.5 **JOB CONDITIONS.** (Not used)
- 1.6 **DELIVERY, STORAGE, AND HANDLING** (Not used)
- 1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

- 3.1 **EXAMINATION.** Examine conditions under which the pipe section, facility, or part of a facility is to be tested or disinfected and verify that conditions are satisfactory and ready for the test to proceed.
- 3.2 **PREPARATION**
- A. **Protection.** Protect adjacent equipment, materials, piping, and valving against drainage from testing and/or disinfection.

- B. **Notification.** Notify the Engineer at least 24 hours prior to any testing and/or disinfecting. Notify the Owner at least 48 hours prior to any disinfecting. Notify the Engineer immediately of all unsatisfactory or nonconforming conditions.
- C. **Responsibility.** Beginning the test means acceptance of all the existing surfaces and conditions.

3.3 PRESSURE MAIN AND PROCESS PIPING LEAKAGE TESTING

- A. **Description.** Provide the leakage tests as directed and as specified herein. Furnish gauges for the tests with the most recent gauge calibration test report available for review on-site.
- B. **Test Section.** No test section shall be longer than 500 feet without approval.
- C. **Leakage Allowances** (unless noted otherwise)
 - 1. Pressure Mains. The maximum leakage allowance for all pressure mains shall be 10.49 gallons per inch diameter per mile of pipe per 24 hours.
 - 2. Process Piping Including Air Piping. No leakage is acceptable.
- D. **Test Procedure**
 - 1. Slowly fill each pressure main or process piping section with water to the specified test pressure in a satisfactory manner.
 - 2. Before applying the specified test pressure, expel all air from the pipe.
 - 3. Maintain the test water pressure for at least 2 hours.
 - 4. Determine leakage by measuring the quantity of water added to the main to maintain the specified test pressure.
 - 5. Unless noted otherwise, minimum test water pressure shall be the greater of 1.5 times the working pressure or the following:
 - a. Mains or process piping carrying water – 150 pounds per square inch (psi).
 - b. Force mains – 100 psi.
 - c. Other pressure mains – 100 psi.
- E. **Air Piping Test Procedure**
 - 1. Backfill the section of air main to be tested prior to testing.
 - 2. Test each valved section of air main with air at the specified test pressure by means of a compressor connected to the main in a satisfactory manner.
 - 3. Bring the air pressure to 150 percent of the system's blower(s) shutoff head (but in no case greater than the pressure rating of the pipe) unless otherwise noted and maintain for at least 2 hours.
 - 4. Determine leakage by comparison of initial and final pressure gauge readings.

3.4 DISINFECTION

A. General

1. Thoroughly clean, flush, and disinfect pipes, tanks, and equipment designed to carry water for domestic consumption before acceptance by the Owner.
2. Engineer will confirm that the item to be disinfected is thoroughly cleaned and flushed prior to disinfection.
3. Disinfection shall be done by the addition of suitable amounts of chlorine in the form of liquid chlorine or high test hypochlorite oflime.
4. The application shall be as approved by the Owner and in accordance with the appropriate AWWA standard listed below.
 - a. Water mains are under AWWA C651.
 - b. Water storage tanks are under AWWA C652.
 - c. Water treatment plants are under AWWA C653.
5. Perform tests for efficacy of disinfection, and repeat disinfection and tests as needed at no cost to the Owner.
6. Dispose of heavily chlorinated water in accordance with AWWA C651 and AWWA C651 Appendix B, and not to a sanitary sewer or the environment unless dechlorinated sufficiently to not interfere with treatment of sanitary sewage or the environment.

3.5 SANITARY SEWER LEAKAGE TESTING

- A. **Test Section.** A sanitary sewer test section shall be from the inlet end of the downstream manhole to the outlet end of the upstream manhole, including all laterals in the sewer.
- B. **Leakage Allowance** (unless noted otherwise). The maximum leakage allowance for all sanitary sewers shall be 100 gallons per inch diameter per mile of pipe per 24 hours.
- C. **Test Procedure.** Use either an infiltration water test, exfiltration water test, or a low-pressure air test for gravity sewers after backfilling is completed.
 1. Infiltration.
 - a. The infiltration test may be selected when the height of the groundwater table is 2 feet or more above the top of the pipe barrel, including house services, at the highest point of the section.
 - b. Measure the amount of infiltration by means of a weir located in the downstream manhole, and the amount shall not exceed the allowable leakage.
 - c. Securely seal the inlet end of the upstream manhole.
 - d. Maintain the test head for a period of not less than 24 hours before the weir measurement is made.

2. Exfiltration.
 - a. When the exfiltration test is selected, close the inlet ends of the upstream and downstream manholes with a watertight bulkhead.
 - b. Fill the sewer along with the upstream manhole with water until the elevation of the water in the upstream manhole is 2 feet higher than the top of the pipe barrel, including house services, in the section being tested, or 2 feet above the existing groundwater in the trench, whichever is the higher elevation.
 - c. Fill and maintain the entire length of section to be tested full of water for a period of approximately 24 hours prior to the start of the test.
 - d. If the water level in the upper manhole has dropped during this 24 hour period, raise the level to the test elevation mark prior to measurement of leakage.
 - e. Determine the exfiltration by measuring the amount of water required to maintain the above stated water elevation for a period of 2 hours from the start of the test.
 - f. The allowable leakage is based on a maximum difference in elevation of 8 feet between the level of water at the upper manhole and the invert of the pipe being tested in the lower manhole.
 - g. If the difference in elevation exceeds 8 feet, increase the allowable leakage 5 percent for each 1 foot in excess of 8 feet.

3. Low-Pressure Air Test. Testing shall meet the requirements of the following standards.

Pipe Material	Testing Standard
Concrete Pipe (24 inches and under)	ASTM C 924
Concrete Pipe (over 24 inches)	ASTM C 1103
Clay Pipe	ASTM C 828
Plastic Pipe	ASTM F 1417
All Others	ASTM F 1417

D. Manhole and Precast Wet Wells Leakage Testing

1. Vacuum-test all sanitary manholes for leaks, instead of the water testing specified above.
2. The vacuum test method shall be in accordance with ASTM C 1244, except as specified otherwise herein.
3. Furnish all equipment and labor required, including necessary piping/hoses, pneumatic plugs, test vacuum equipment (vacuum pump and vacuum plate/head), vacuum gauge, and second timer. The vacuum gauge shall have a maximum range of 0 to 30 inches of mercury (Hg) and the vacuum gauge figure intervals shall be in 1/2-inch increments.
4. Perform the vacuum test witnessed by the Engineer.
5. Remove all pneumatic plugs after the test.

3.6 **STORAGE TANK LEAKAGE TESTING.** Demonstrate water tightness of all liquid-bearing tanks in accordance with ACI 350.1, "Tightness Testing of Environmental Engineering Concrete Structures."

3.7 **FIELD QUALITY CONTROL**

A. Field Tests

1. Provide all test materials, equipment, chemicals, and water required for testing or disinfection at no additional cost to the Owner.
2. Perform testing according to the methods described in this section.

B. Witness

1. All leakage tests shall be witnessed and approved before acceptance.
2. Any test performed without witness by the Engineer, may require retesting the section in conformance with this specification at no cost to the Owner.

C. Test Results

1. If the field tests show excessive leakage, repair, adjust, modify, or replace the noncomplying sections until the tests are successfully completed.
2. If the field tests show noncompliance with the disinfection requirements, repeat the disinfection procedure until the tests are successfully completed.
3. This shall be done at no additional cost to the Owner.

3.8 **CLEANING AND DISPOSAL.** Remove and dispose of all excess material and debris as a result of the work completed under this section, including testing procedures.

3.9 **PROTECTION**

- A. **Protect the sections tested** and approved, but prior to acceptance by the Owner.
- B. **Protection of the tested** and approved piping sections shall include provisions during installation and testing of nearby piping, valving, or other adjacent equipment.
- C. **Remove all protective measures** installed at completion and acceptance of the project.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** Furnish and install the cast-in-place concrete in accordance with the drawings and as specified herein.
1. This section specifies cast-in-place concrete, including formwork, reinforcing, mix design, accessories, placement procedures, joints, finishes, curing, supports for equipment and piping, and grout toppings for tanks.
 2. Other specification sections may reference this section for other cast-in-place concrete items.
 3. Install embedded items required for material and equipment specified in other divisions of these specifications.

1.3 QUALITY ASSURANCE

- A. **Codes and Regulatory Agencies.** Perform all work in compliance with all federal, state, and local codes and regulatory agencies.
- B. **Standards.** Comply with the provisions of the following standards:
1. ACI – American Concrete Institute.
 2. ASTM – American Society for Testing and Materials.
 3. CRSI – Concrete Reinforcing Steel Institute.
 4. AASHTO – American Association of State Highway and Transportation Officials.
 5. AWWA – American Water Works Association.
- C. **Concrete Testing Service.** Engage an acceptable laboratory to perform material evaluation tests and to design concrete mixes.
- D. **Testing.** Materials and installed work may require testing and retesting at any time during progress of work. Retesting of rejected materials or installed work shall be done at Contractor's expense.
- E. **Concrete Conference.** Conduct conference at project site to comply with the following:
1. Prior to submittal of design mixes, conduct a meeting to review detailed requirements for preparing concrete design mixes and to determine procedures for satisfactory concrete operations. Review requirements for

submittals, status of coordinating work, and availability of materials. Establish preliminary work progress schedule and procedures for materials inspection, testing, and certifications. Request that representatives of each entity directly concerned with cast-in-place concrete attend conference, including, but not limited to, the following:

- a. Contractor's superintendent.
 - b. Laboratory responsible for concrete mix design.
 - c. Laboratory responsible for field quality control.
 - d. Ready-Mix concrete supplier.
 - e. Concrete subcontractor.
 - f. Primary admixture manufacturers.
 - g. Engineer/Architect or Owner's Representative.
2. Concrete conference may be waived by the Engineer/Architect or Owner's Representative.

1.4 SUBMITTALS

A. General

1. Submit all submittals in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.

B. Submittal Package No. 1 – Shop Drawings and Product Data

1. Product Data. Submit product data for materials and items, such as cement, reinforcement, embedded forming accessories, admixtures, patching compounds, waterstops, joint systems, and curing compounds.
2. Shop Drawings and Submittals.
 - a. Reinforcement. Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI SP-66 (88), "ACI Detailing Manual," showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures, and dowel reinforcement for masonry.
 - b. Concrete Mix Designs. Submit concrete mix designs for each class of concrete to be used on the project including specifics regarding admixtures proposed for each mix design. Include concrete test reports to substantiate trial batch mixes or previous performance of the same mix design.
 - c. Materials Certificates. Submit materials certificates with the concrete mix design. Materials certificates shall be signed by manufacturer certifying that each material item complies with or exceeds specified requirements. Provide certification from admixture manufacturers that chloride content complies with specification requirements.

- d. Construction Joint Locations. Submit details which clearly show where construction joints are intended to be placed in walls, slabs, columns, beams, at stairwells, etc.
 - e. Box Outs. Submit proposed locations of box outs.
3. Testing Laboratories. Submit the names of the testing laboratories proposed for use to perform the material evaluation tests and also to perform the field quality control testing. An ACI certified technician shall perform all concrete testing.

C. Submittal Package No. 2 – Batch Tickets

1. Batch Tickets. Submit batch tickets for each load of concrete used on the job. Each ticket shall indicate the design mix, the project name, the date, the time of batching, and the truck number.

D. Submittal Package No. 3 – Test Reports

1. Concrete Test Reports. Submit two copies of all concrete test reports from the concrete testing laboratory directly to the Engineer/Architect.

1.5 JOB CONDITIONS

- A. **Coordination.** Coordinate installation of joint materials, embedded items, vapor retarders, etc., with placement of forms and reinforcing steel. Coordinate concrete work with all other trades to prevent delays, errors, or omissions.
- B. **Reference Material.** Provide a copy of ACI SP-15, Field Reference Manual, in the field office at all times during concrete construction.
- C. **Climatic Conditions.** Perform placement and curing of concrete under various weather conditions in accordance with ACI 301, "Specifications for Structural Concrete for Buildings," ACI 305, "Hot Weather Concreting," and ACI 306, "Cold Weather Concreting," except as modified herein.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. **General.** Comply with ACI 304, "Recommended Practice for Measuring, Mixing, and Placing Concrete."

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Forms

1. Exposed finish concrete forms shall be plywood, metal, metal framed plywood faced, or other acceptable panel type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest

practicable sizes to minimize number of joints and to conform to joint system shown.

2. Unexposed finish concrete forms shall be plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.
3. Cylindrical column and support forms shall be metal, fiberglass reinforced plastic, or paper or fiber tubes.
 - a. When used, provide paper or fiber tubes of laminated plies with water resistant adhesive and wax impregnated exterior for weather and moisture protection.
 - b. Provide sufficient wall thickness to resist wet concrete loads without deformation.

B. Form coatings. Commercial formulation form coating compounds with a maximum volatile organic compound (VOC) of 350 milligrams per liter (mg/l) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

C. Form ties. Factory-fabricated, adjustable length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal.

1. Provide units that will leave no metal closer than 1 inch to exposed surface.
2. Provide ties that, when removed, will leave holes not larger than 1/2 inch diameter in concrete surface.

D. Reinforcing Materials

1. Reinforcing Bars. ASTM A 615, A 616, including Supplemental Requirement S1, or A 617; Grade 60, deformed.
2. Epoxy Coated Reinforcing Bars. ASTM A 775.
3. Welded Wire Fabric. ASTM A 185, welded steel wire fabric, provided in flat sheets.
4. Supports for Reinforcement. Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use steel bar supports or precast concrete bar supports complying with CRSI specifications.
 - a. For slabs on grade, use steel bar supports with sand plates or horizontal runners or precast concrete bar supports where base material will not support chair legs.
 - b. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs that are plastic protected (CRSI, Class 1) or stainless steel (CRSI, Class 2).

E. Concrete Materials

1. Portland Cement. ASTM C 150, Type I or Type II in areas where alkali-aggregate reaction is a problem. Use one brand of cement throughout project.
2. Fly Ash. ASTM C 618, Type C or Type F including supplementary optional physical requirements, except loss on ignition shall not exceed 3 percent.
3. Normal Weight Aggregates. ASTM C 33 and as herein specified.
 - a. For exposed concrete, provide aggregates from a single source.
 - b. For exterior exposed surfaces, do not use fine or coarse aggregates containing deleterious substances which might cause spalling.
 - c. Fine Aggregate. Fine aggregate shall consist of natural sand or manufactured sand.
 - d. Coarse Aggregate. Coarse aggregate shall consist of crushed rock, gravel, or crushed gravel.
 - 1) Grading. The coarse aggregate shall conform to requirements for Size 57, unless otherwise approved.
 - 2) Deleterious substances shall not exceed the percentages for Class 4S.
4. Water. Potable.
5. Admixtures. Provide admixtures that contain a maximum of 0.05 percent chloride ions by weight of cement when tested in accordance with AASHTO T260. Certificate from admixture manufacturer will be required prior to mix design approval.
 - a. Air-Entraining Admixture.
 - 1) ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
 - 2) Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a) Darex II or Daravair, GCP Applied Technologies
 - b) MasterAir VR 10 or MasterAir AE 200, Master Builders, Inc.
 - c) Sika AER, Sika Corp.

- d) AEA-92 or Air Mix 200, Euclid Chemical Co.
- b. Water-Reducing Admixture.
 - 1) ASTM C 494, Type A.
 - 2) Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a) Eucon WR-75 or WR-89, Euclid Chemical Co.
 - b) WRDA with Hycol, GCP Applied Technologies
 - c) Daracem-55, GCP Applied Technologies
 - d) MasterPozzoloth 220, MasterPozzoloth 322, or MasterPolyheed, Master Builders, Inc.
 - e) Plastocrete 161, Sika Corp.
- c. High-Range Water-Reducing (HRWR) Admixture (Super Plasticizer).
 - 1) ASTM C 494, Type F or Type G.
 - 2) Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a) Eucon 37, Euclid Chemical Co.
 - b) Daracem 19, Daracem ML330, or Daracem ML500, GCP Applied Technologies
 - c) MasterRheobuild, Master Builders, Inc.
 - d) Sikament, Sika Corp.
- d. Noncorrosive, Nonchloride Accelerating Admixture.
 - 1) ASTM C 494, Type C or E.
 - 2) Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a) Accelguard 80, Euclid Chemical Co.
 - b) Polarset, GCP Applied Technologies
 - c) MasterSet FP 20, Master Builders, Inc.

- e. Water-Reducing, Retarding Admixture.
 - 1) ASTM C 494, Type D.
 - 2) Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a) Eucon Retarder 75, Euclid Chemical Co.
 - b) Daratard-17, GCP Applied Technologies
 - c) MasterPozzolith, Master Builders, Inc.
 - d) Plastiment, Sika Corporation.

- f. Crystalline Waterproofing Admixture. Subject to compliance with requirements, products that may be incorporated in the work include the following:
 - 1) Penetron ADMIX.
 - 2) Aquafin-IC.
 - 3) Kryton KIM.
 - 4) Xypex ADMX C-Series.
 - 5) BASF Masterlife 300D.

2.2 ACCESSORIES

- A. **Reglets.** Where resilient or elastomeric sheet flashing or bituminous membranes are terminated in reglets, provide reglets of not less than 0.0217-inch-thick (26-gauge) galvanized sheet steel. Fill reglet or cover face opening to prevent intrusion of concrete or debris.

- B. **Polyvinyl (PVC) Chloride Waterstops.** Corps of Engineers CRD-C 572.
 - 1. Waterstops for construction joints shall be serrated type without center bulb and at least 3/8 inch thick and 6 inches wide.
 - 2. Waterstop for expansion joints shall be serrated type with center bulb and at least 3/8 inch thick and 9 inches wide.
 - 3. Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to, the following:
 - a. Greenstreak Plastic Products Co.
 - b. DuraJoint.
 - c. BoMetals, Inc.

- C. **Bitumen Waterstops**
 - 1. Provide a single component self-sealing plastic adhesive type waterstop which is nonoxidizing, nonevaporating, nonexpanding, non-shrinking, and resistant to water, chemicals, and saturated hydrogen sulfide.

2. Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to, the following:
 - a. Synko-Flex, Synko-Flex Products.
 - b. Seal-Tite, DuraJoint.
- D. **Sand Cushion.** Clean, manufactured or natural sand conforming to ASTM C 33 or C 144.
- E. **Vapor Retarder.** ASTM E 1745 Class A Compliant with a permeance of 0.01 before and after mandatory conditioning as required by (ASTM E 1745 Section 7.1 and Sub-paragraphs 7.1.1 – 7.1.5).
1. Provide vapor retarder cover over prepared base material where indicated below slabs on grade.
 2. Subject to compliance with these specifications, the vapor retarder may be one of the following:
 - a. Stego Wrap 15 mil by Stego Industries, LLC
 - b. Vapor Flex by Layfield
 - c. Moistop Ultra 15 by Fortifiber Industries
- F. **Chemical Hardener.** Colorless aqueous solution containing a blend of magnesium fluosilicate and zinc fluosilicate combined with a wetting agent, containing not less than 2 pounds of fluosilicates per gallon.
1. Use hardener on existing concrete where noted.
 2. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. Surfhard, Euclid Chemical Co.
 - b. Lapidolith, Sonneborn
 - c. Fluohard, L&M Construction Chemical, Inc.
- G. **Sealer/Dustproofer**
1. Floor hardener compound for new concrete shall be an acrylic containing not less than 14 percent solids.
 2. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. Super Diamond Clear VOX, Euclid Chemical Company.
 - b. Dress and Seal WB30, L&M Construction Chemicals, Inc.
- H. **Absorptive Cover.** Burlap cloth made from jute or kenaf, weighing approximately 9 ounces per square yard, complying with AASHTO M 182, Class 2.

- I. **Moisture-Retaining Cover.** One of the following complying with ASTM C 171.
1. Waterproof paper.
 2. Polyethylene film.
 3. Polyethylene coated burlap.
- J. **Curing Compound.** Clear styrene acrylate type, 30 percent solids content minimum.
1. Submit test data from an independent testing laboratory indicating a maximum moisture loss of 0.55 kilograms (kg) per square meter when applied at a coverage rate of 200 square feet per gallon.
 2. Verify compatibility of curing compound with finishes to be used.
 3. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. Super Diamond Clear VOX, Euclid Chemical Company.
 - b. Dress and Seal WB30, L&M Construction Chemicals, Inc.
- K. **Evaporation-Control Compound**
1. Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.
 2. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. Aquafilm, Dayton Superior
 - b. Eucobar, Euclid Chemical Co.
 - c. E-Con, L&M Construction Chemicals, Inc.
 - d. MasterKure ER 50, Master Builders, Inc.
- L. **Bonding Compound**
1. Polyvinyl acetate or acrylic base.
 2. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. Polyvinyl Acetate (Interior Only). Appropriate product by:
 - 1) Dayton Superior Corp.
 - 2) Euclid Chemical Co.
 - 3) Larsen Products Corp.
 - 4) L&M Construction Chemicals, Inc.
 - b. Acrylic or Styrene Butadiene. Appropriate product by:
 - 1) Euclid Chemical Co.

- 2) GCP Applied Technologies
- 3) Master Builders, Inc.
- 4) Stonhard, Inc.

M. Epoxy Adhesive

1. ASTM C 881, two-component material suitable for use on dry or damp surfaces.
2. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. Sikadur 32 Hi-Mod, Sika Corp.
 - b. Euco Epoxy System #452 or #620, Euclid Chemical Co.
 - c. Epobond, L&M Construction Chemicals, Inc.

N. Expansion Joint and Isolation Joint Material. Use one of the following unless noted otherwise.

1. Self-expanding cork conforming to ASTM D 1752, Type III.
2. Cellular fiber-asphalt conforming to ASTM D 1751.
3. Neoprene/SBR polymer conforming to ASTM D 1056-67.

2.3 MIXES

A. General

1. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301.
2. If trial batch method used, retain an acceptable independent testing facility for preparing and reporting proposed mix designs.
3. The testing facility shall not be the same as used for field quality control testing.
4. Submit mix designs of each proposed mix for each class of concrete at least 15 days prior to start of work.
5. Do not begin concrete production until proposed mix designs have been reviewed.
6. Limit use of fly ash not to exceed 25 percent of cement content by weight.
 - a. In areas where alkali aggregate reaction is a problem, do not add less than 20 percent fly ash by weight.
 - b. When used, fly ash shall replace cement at a 1:1 ratio for Class C fly ash and a 1.25:1 ratio for Class F fly ash (Class F fly ash to cement).

- c. Adjust weights of concrete materials to provide the correct yield.
- B. **Design Mixes.** Provide normal weight concrete with the following properties, unless otherwise indicated. Tolerance for air content shall be ± 1 percent.
- 1. Class A. 4,000 pounds per square inch (psi), 28-day compressive strength.
 - a. Water/Cementitious Product (w/c) ratio, 0.45 maximum; minimum cementitious material, 541 pounds per cubic yard (cy).
 - b. 6 percent air.
 - 2. Class B. 3,000 psi, 28-day compressive strength.
 - a. w/c ratio, 0.50 maximum; minimum cementitious material, 541 pounds per cy.
 - b. 6 percent air.
 - 3. Class C. 2,000 psi, 28-day compressive strength.
 - a. w/c ratio, 0.6 maximum; minimum cementitious material, 376 pounds per cy.
 - b. 6 percent air.
 - 4. Class D.
 - a. w/c ratio, 0.45 maximum; minimum cementitious material, 846 pounds per cy.
 - b. Fine aggregate to cement ratio shall not exceed 3.0 by weight.
 - c. 6 percent air.
 - 5. Class S. 4,500 psi, 28-day compressive strength.
 - a. w/c ratio, 0.42 maximum; minimum cementitious material, 564 pounds per cy.
 - b. 6 percent air.
 - 6. Class W. In accordance with Class S, except:
 - a. Contains crystalline waterproofing admixture in accordance with paragraph 2.1.E.5.f.
 - b. Dose in accordance with admixture manufacturer's recommendations.
- C. **Slump Limits.** Proportion and design mixes to result in concrete slump at point of placement as follows:
- 1. Ramps and sloping surfaces. Less than 3 inches.
 - 2. Reinforced foundation systems. 2 to 4 inches.

3. Concrete containing HRWR admixture (Superplasticizer). Less than 8 inches after addition of HRWR to site verified 2-inch to 3-inch slump concrete without HRWR.
 4. Other concrete. Less than 4 inches for slabs and less than 5 inches for walls, curbs, bases, and other miscellaneous concrete.
- D. **Chloride Content.** The maximum water-soluble chloride ion content, expressed as a percent by weight of cement contributed by all ingredients of the concrete mix shall not exceed 0.10 percent.
- E. **Controlled Density Fill or Controlled Low-Strength Material.** The fine aggregates shall be fine enough to stay in suspension in the mixture to the extent required for proper flow. Provide with the following properties, unless otherwise indicated:
1. 100 psi, 28-day compressive strength.
 - a. Cement, 100 pounds.
 - b. Fly Ash, 250 pounds.
 - c. Fine Aggregate, Saturated Surface Dry, 2,800 pounds.
 - d. Water, 500 pounds maximum.
 2. It is necessary for bleed water to appear on the surface immediately after the fill is struck off.
 - a. A delay in bleeding indicates there are too many fines in the mixture, so reduce the fly ash quantity in increments of 50 pounds until mixture is bleeding freely.
 - b. Add approximately 60 pounds of sand to replace each 50-pound increment of fly ash to maintain the original yield.
- F. **Dry Pack Mortar.** Mix dry pack, consisting of one part portland cement to 2 1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing.
- G. **Cement Mortar.** A mixture of sand, cement, and water in the same proportions used for the concrete being placed, but omit all coarse aggregate.
- H. **Adjustment to Concrete and Mixes.** Request mix design adjustments when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as approved. Submit laboratory test data for revised mix design and strength results for acceptance before using in work.
- I. **Admixtures.** Use of Admixtures.
1. Use water-reducing admixture for placement and workability in all classes of concrete unless noted otherwise.
 2. A noncorrosive nonchloride accelerating admixture may be used in concrete slabs placed at ambient temperatures below 50 degrees Fahrenheit (° F.) when approved.

3. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content as indicated in the design mix.
- J. **Concrete Mixing.** Ready Mix Concrete. Comply with requirements of ASTM C 94 and as specified.
1. When air temperature is between 85° F. and 90° F., mixing and delivery time shall not exceed 75 minutes.
 2. When air temperature is above 90° F., mixing and delivery time shall not exceed 60 minutes unless approved otherwise.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. **Tolerances.** Unless otherwise specified, tolerances shall be in accordance with ACI 117 and ACI 301.
- B. **Inspection.** Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other trades to permit installation of their work; cooperate with other trades in setting such work. Verify that all wood, dirt, foreign objects, and all other debris have been removed from inside the formwork. Verify that reinforcing steel is spaced to provide the proper coverage against forms and against earth for slabs on grade. When requested, provide documentation of inspection prior to placing concrete.
- C. **Site and Weather Conditions.** Do not place concrete when site conditions exist such as standing water, extreme heat or cold, etc., unless the proper precautions have been taken to properly place and protect concrete as recommended by ACI and as acceptable. Do not place concrete on frozen ground.

3.2 PREPARATION

A. Forms

1. General. Design, erect, support, brace, and maintain formwork to support vertical and lateral, static and dynamic loads that might be applied until concrete structure can support such loads. Maintain formwork construction tolerances complying with ACI 347.
2. Forms. Construct forms to sizes, shapes, lines, position, elevation, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.
3. Fabrication of Forms. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or

wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.

4. Openings. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
5. Exposed Corners and Edges. Chamfer exposed corners and edges using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
6. Provisions for Other Trades. Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.
7. Cleaning and Tightening. Thoroughly clean forms and adjacent surfaces to receive concrete. Remove wood, sawdust, dirt, or other debris just before concrete is placed. Retighten forms and bracing before concrete placement as required to prevent mortar leaks and maintain proper alignment.
8. Form Coatings. Coat contact surfaces of forms with an approved, nonresidual, low VOC, form coating compound before reinforcement is placed.
 - a. Do not allow excess form coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.
 - b. Coat steel forms with a nonstaining, rust preventative material. Rust stained steel formwork is not acceptable.
 - c. Form coatings for use in water treatment plants shall be nontoxic after 30 days from the date the forms are removed.

B. Reuse of Forms

1. Clean and repair surfaces of all forms to be reused in work. Split, frayed, delaminated, or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.
2. Successive Reuse. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces except as acceptable.

3.3 INSTALLATION

A. Vapor Retarder Installation

1. General. Install vapor retarder where shown on drawings per ASTM E/643-10. Following leveling and tamping of granular base for slabs on grade, place vapor retarder sheeting with longest dimension parallel with direction of pour.
2. Lapping. Lap joints 6 inches and seal vapor barrier joints with manufacturer's recommended mastic and pressure sensitive tape.
3. Protection. After placement of vapor retarder, cover with sand cushion, dampen and compact to 100 percent as determined by ASTM D 698 to the depth as shown on drawings. Sand shall be free of self-draining water when concrete is placed.

B. Placing Reinforcement

1. General. Comply with CRSI's recommended practice for "Placing Reinforcing Bars" for details and methods of reinforcement placement and supports and as herein specified.
 - a. Avoiding cutting or puncturing vapor retarder barrier during reinforcement placement and concreting operations.
2. Cleaning. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.
3. Installation.
 - a. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved.
 - b. Place reinforcement to obtain at least minimum coverages for concrete protection as noted in ACI 301. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
 - c. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh plus 2 inches or 8 inches and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

C. Joints

1. Construction Joints. Locate and install construction joints as indicated or, if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable.
 - a. Provide keyways 1-1/2 inches deep in construction joints in walls and slabs and between walls and footings. Accepted bulkheads designed for this purpose may be used for slabs.

- b. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as otherwise indicated.
 - c. The maximum length of wall pours shall not exceed 40 feet, and slab pours shall not exceed 40 feet in length or width.
 - d. Bond fresh concrete to hardened new concrete as follows:
 - 1) For horizontal joints, place new concrete on a 1-inch layer of cement mortar evenly spread over the previously placed concrete. Thoroughly clean and remove laitance of previously placed concrete.
 - 2) For vertical joints, thoroughly clean the surface of the hardened concrete and remove all laitance prior to placing new concrete.
 - e. If noted on the drawings, prior to placement of new concrete against old existing concrete, apply bonding agent to surface of old concrete, if accessible, immediately before placement of new concrete.
 - f. Make provisions to support and protect exposed waterstops during progress of work. Field-fabricate joints in waterstops in accordance with manufacturer's printed instructions. Provide continuous waterstops in construction joints as follows:
 - 1) Liquid-bearing walls and slabs.
 - 2) Walls or slabs subject to groundwater and/or in contact with ground.
 - 3) Elsewhere as indicated.
2. Isolation Joints in Slabs-on-Ground. Construct isolation joints as indicated in slabs-on-ground at points of contact between slabs-on-ground and vertical surfaces, such as column pedestals, foundation walls, grade beams, and elsewhere as shown. Fill joints where noted with sealant specified in other sections of these specifications.
3. Contraction (Control) Joints in Slabs-on-Ground. Construct contraction joints in slabs-on-ground to form panels of patterns as shown. Use saw cuts 1/8 inch wide by 1/4 slab depth, unless otherwise indicated. In lieu of saw cutting and with, the Contractor may form contraction joints by inserting premolded plastic, hardboard, or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface. Tool slab edges round on each side of insert. After concrete has cured, remove inserts and clean groove of loose debris.
- a. Saw-cut as soon as possible after slab finishing without dislodging aggregate.

- b. If joint pattern not shown, provide joints not exceeding 15 feet in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third bays).
 - c. Provide joint, filler, and sealant materials where shown.
4. Control Joints in Retaining Wall. Provide control joints at 32 feet on center maximum unless otherwise shown. Provide 1-1/2 inch deep by 1/3 wall thickness vertical keyway. Horizontal reinforcing shall not pass through joint. Joints need not be provided in retaining wall footings.
 5. Expansion Joints. Construct expansion joints where shown. If not shown, provide expansion joints at interval not to exceed the following:
 - a. Retaining Walls. 96 feet (not required in footings).
 6. Waterstop. Provide waterstops in all joints shown on the drawings and as listed in this specification.
 - a. Provide PVC waterstops in all joints unless noted or specified otherwise.
 - b. Properly support and wire all waterstops to reinforcing to remain straight and true. Heat-splice all joints per manufacturer's recommendations.
 - c. Provide bitumen waterstop in joint between new and existing concrete.

D. Installation of Embedded Items

1. Set and build into the work, anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by other prime Contractors and suppliers of items to be attached thereto.
2. Install reglets to receive top edge of foundation sheet waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, relieving angles, and other conditions.
3. Set edge forms, bulkheads, and intermediate screed strips for slabs to obtain required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting type screeds.

E. Concrete Placement

1. Location. Provide concrete as specified in the table below unless otherwise indicated on the drawings.

Location	Design Mix
All reinforced concrete and nonreinforced fillets	4,500 psi Class S
Nonreinforced concrete not	

designated as Class A, C, or D	3,000 psi Class B
Nonreinforced so designated on plans	2,000 psi Class C
Grout fill or topping as designated on plans	Class D

2. General. Comply with ACI 304, "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete," and as herein specified.
 - a. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete that has hardened sufficiently to cause the formation of seams or planes of weakness, or to be resistant to the penetration of a vibrator. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete to avoid segregation at its final location.

3. Placing Concrete in Forms. Deposit concrete in forms in horizontal layers not deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
 - a. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.
 - b. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete around reinforcement and other embedded items without causing segregation of mix.

4. Placing Concrete Slabs. Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
 - a. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners. When epoxy coated reinforced steel is used, vibrators shall have nonmetallic heads.
 - b. Bring slab surfaces to correct level with straightedge and strike off. Use highway straightedge, bull floats, darbies, or other means to obtain a smooth surface which is free of humps or hollows and that conforms to the required flatness and levelness. Do not disturb slab surfaces prior to beginning finishing operations.

- c. Maintain reinforcing in proper position during concrete placement.
5. Cold Weather Placing. Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
- a. When air temperature has fallen to or is expected to fall below 40° F. (4° C.), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50° F. (10° C.) and not more than 80° F. (27° C.) at point of placement.
 - b. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - c. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
6. Hot Weather Placing. When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.
- a. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90° F. (32° C.). Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.
 - b. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
 - c. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.
 - d. Use water reducing retarding admixture when required by high temperatures or other adverse placing conditions, when acceptable to Engineer/Architect.
 - e. Use evaporation control compound in accordance with manufacturer's recommendations or fogging.
7. Adjusting Concrete Slump at Job Site.
- a. Slump Greater than Specified. Do not use concrete with slump greater than specified.
 - b. Slump Less than Specified. If on arrival at the job site, the slump of the concrete is less than specified, the following remedies may be used at the Contractor's option.
 - 1) Add water only if the maximum specified w/c ratio is not exceeded.

- 2) Additional water shall be accompanied by a quantity of cement sufficient to maintain the specified w/c ratio.
- 3) Add an approved water reducing admixture.

F. Controlled Density Fill Placement

1. General. Unless noted otherwise, place controlled density fill in overexcavated areas under slabs, in utility trenches within roadways, and as directed by the Engineer/Architect.
2. Mixing Equipment. Sufficient mixing capacity of mixers shall be provided to permit the fill to be placed without interruption.
3. Placing Fill. Flowable fill shall be discharged from the mixer by any reasonable means into the space to be filled. The fill material shall be brought up uniformly to the fill line shown on the plans or as directed. Placing of any material over low strength fill may commence as soon as the surface water is gone or as directed.

G. Finish of Formed Surfaces. Inside face of covered basins, clear wells and reservoirs, filters below the media line, open tanks and flumes below water or flow lines, and the outside of structures below finish grade lines shall be classified as not exposed to view.

1. Finish. Finish formed concrete surfaces in accordance with the schedule below.

Location	Type of Finish
Concrete surfaces not exposed to view or surfaces to be covered with a coating material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or other similar system	Smooth form finish
Concrete exposed to view including surfaces which will be painted	Smooth rubbed finish or grout-cleaned finish

2. Smooth Form Finish. This is an as-cast concrete surface obtained with selected form facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas with fins and other projections completely removed and smoothed.
3. Smooth Rubbed Finish. Provide smooth-rubbed finish not later than 1 day after form removal. Moisten concrete surfaces and rub with carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.
4. Grout-Cleaned Finish. Mix one part portland cement and 1-1/2 parts fine sand with sufficient water to produce a grout with the consistency of thick paint. Substitute white portland cement for a part of the gray portland cement in order to produce a color matching the color of the surrounding concrete, as determined by a trial patch. Wet the surface of

the concrete sufficiently to prevent absorption of water from the grout and apply the grout uniformly with brushes or a spray gun. Immediately after applying the grout, scrub the surface with a cork float or stone to coat the surface and fill all air bubbles and holes. While the grout is still plastic, remove all excess grout by working the surface with a rubber float, burlap, or other means. After the surface whitens from drying, rub with clean burlap. The finish shall be kept damp for at least 36 hours after final rubbing.

5. Related Unformed Surfaces. At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

H. Slab Finishes

1. Finish. Finish slab surfaces in accordance with the schedule below unless finish is specifically noted on the drawings:

Location	Type of Finish
Slabs to receive grout topping	Rough finish
Slabs to receive concrete topping or mortar setting beds for tile, Portland cement terrazzo, and other bonded applied cementitious finish flooring material, and as otherwise indicated	Scratch finish
Slabs to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo, and as otherwise indicated	Float finish
Slabs of tanks, flumes, channels, wet wells, etc., which are submerged including grout toppings	Trowel finish after float finishing
Slabs to be exposed to view or covered with resilient flooring, carpet, ceramic or quarry tile, paint or other thin film finish coating system	Trowel finish after float finishing
Slabs to be covered with ceramic quarry tile installed with thin set mortar	Float finish followed by trowel and fine broom finish
Exterior concrete platforms, steps, ramps, and elsewhere as indicated	Float finish followed by nonslip broom finish

2. Floor Levelness, General. Floor levelness requirements below do not apply to sloped slabs or unshored slabs on metal deck.
3. Scratch Finish. After placing slabs, plane surface to tolerances for floor flatness (Ff) of 20 and floor levelness (Fl) of 17. Slope surfaces

uniformly to drains where required. After leveling, roughen surface before final set with stiff brushes, brooms, or rakes.

4. Float Finish. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating, using float blades or float shoes only, when surface water has disappeared, when concrete has stiffened sufficiently to permit operation of power driven floats, or both. Consolidate surface with power driven floats or by hand floating if area is small or inaccessible to power units. Check and level surface plane to tolerances of Ff 25 - Fl 20. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.
5. Trowel Finish. After floating, begin first trowel finish operation using a power driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand troweling operation, free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances of Ff 50 - Fl 35. Grind smooth surface defects that would telegraph through applied floor covering system.
6. Trowel and Fine Broom Finish. Apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming.
7. Nonslip Broom Finish. Immediately after float finishing, slightly roughen concrete surface by brooming with stiff fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Engineer/Architect before application.
8. Rough Finish. The bottom of concrete tanks which are to receive grout topping shall receive a rough finish for maximum adhesion. The surface to receive the grout topping shall be intentionally roughened to a minimum amplitude of 1/4 inch.
9. Chemical Hardener Finish. Apply chemical hardener finish to existing interior concrete floors where indicated. Clean floors and allow to dry before applying hardener.
 - a. Apply proprietary chemical hardeners, in accordance with manufacturer's printed instructions.
 - b. After final coat of chemical hardener solution is applied and dried, remove surplus hardener by scrubbing and mopping with water.
10. Sealer/Dustproofer Finish. All exposed surfaces and floors within buildings which will be subject to pedestrian or vehicular traffic under normal operation, shall be treated to seal and dustproof the surface. This shall be accomplished by the use of a liquid sealer/dustproofer applied in three applications in accordance with the manufacturer's directions. Application of the sealer/dustproofer shall be performed as late as possible and just prior to completion of construction.

- I. **Placing Grout Toppings.** Grout toppings shall be Class D concrete mix design unless noted otherwise.
1. Procedure.
 - a. Prior to placement of the structurally bonded topping, remove all laitance, debris, and loose and foreign material from the base slab. Use water-blasting, sandblasting, or other methods acceptable to the Engineer/Architect.
 - b. Thoroughly wet the base slab before placing the grout topping. Remove all standing water from the surface prior to placing neat cement grout.
 - c. Brush in neat cement grout as a bonding agent immediately before application of grout topping. Do not allow neat cement grout to set prior to placing grout topping.
 - d. Where recommended by manufacturer, use the tank mechanism to screed the grout on the tank floor as it is placed. Screed in accordance with the manufacturer's instructions.
 - e. Trowel finish topping as specified above.
 - f. Moisture cure grout toppings as specified herein.

J. **Miscellaneous Concrete Items**

1. Filling In. Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.
2. Equipment Bases and Foundations. Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment complying with diagrams or templates of manufacturer furnishing machines and equipment.

3.4 **CONCRETE SURFACE REPAIRS**

- A. **Patching Defective Areas.** Repair and patch defective areas and plug form tie holes with cement mortar immediately after removal of forms, when acceptable to Engineer/Architect.
1. Cut out honeycomb, rock pockets, and voids over 1/4 inch in any dimension down to solid concrete but in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush coat the area to be patched with specified bonding compound. Place patching mortar before bonding compound has dried.
 2. For exposed-to-view surfaces, blend white portland cement and standard portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface. After shrinkage has occurred, grind surface until flush.

- B. **Repair of Formed Surfaces.** Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Engineer/Architect. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on surface, and stains and other discolorations that cannot be removed by cleaning.
- C. **Repair of Unformed Surfaces.** Repair or replace supported slabs that fail to meet the specified finish requirements. Correct levelness and flatness, and low and high areas as herein specified. For slabs on grade, remove slab between control joints and replace with concrete slab meeting floor finish and tolerances. For all other unformed surfaces, repair as follows:
1. Repair finished unformed surfaces that contain defects that affect durability of concrete. Surface defects, as such, include crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through nonreinforced sections regardless of width, spalling, popouts, honeycomb, rock pockets, and other objectionable conditions.
 2. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days.
 3. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with patching compound. Finish repaired areas to blend into adjacent concrete. Underlayment compounds may be used when acceptable.
 4. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4 inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
- D. **Miscellaneous Repairs.** Repair isolated random cracks and single holes not over 1 inch in diameter by dry pack method. Groove top of cracks and cut out holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Place dry pack mortar before bonding compound has dried. Compact dry pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.
- E. **Approval.** Perform structural repairs with prior approval of Engineer/Architect for method and procedure, using specified epoxy adhesive and mortar.
- F. **Alternative Repair Methods.** Repair methods not specified above may be used, subject to acceptance.

3.5 QUALITY CONTROL TESTING DURING CONSTRUCTION

- A. **General.** Employ an approved testing laboratory to perform tests and to submit test reports. ACI Grade 1 certified technician employed by the testing laboratory shall be present during the placing of all concrete. The concrete testing laboratory shall send two copies of all test reports directly to the Engineer/Architect.
- B. **Sampling Fresh Concrete.** Sample concrete in accordance with ASTM C 172, except modified for slump to comply with ASTM C 94.
1. **Slump.** Slump tests shall be performed at the point of truck discharge prior to adding plasticizers in accordance with ASTM C 143. For each class of concrete, perform one test for each compressive strength test and additional tests when concrete consistency seems to have changed. If the slump is adjusted at the job site, the concrete testing agency shall be responsible for reporting the following.
 - a. Method used to adjust slump.
 - b. Quantity of each material added.
 - c. Resulting slump.
 2. **Air Content.** Perform daily for each class of concrete placed in accordance with ASTM C 173 volumetric method for lightweight concrete; ASTM C 231 pressure method for normal weight concrete; one test for each compressive strength test, one test for the first load of each type of air entrained concrete delivered, and one test for each truck when air content is adjusted until consistent results are obtained.
 3. **Concrete Temperature.** Test hourly when air temperature is 40° F. (4° C.) and below, when 80° F. (27° C.) and above, and each time a set of compressive test specimens is made.
 4. **Compressive Test Specimen.** Perform in accordance with ASTM C 31 and as follows:
 - a. Prepare one set of four standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field cured test specimens are required. Contractor may also prepare field cured test specimens to be used for early form removal.
 - b. Prepare one set of cylinders for each 100 cy of concrete or fraction thereof, of each concrete class placed in any one day.
 - c. Perform compressive strength tests in accordance with ASTM C 39. Test one specimen at 7 days, and two specimens at 28 days, and hold one specimen in reserve for later testing if required.
 - d. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.
 - e. When total quantity of a given class of concrete is less than 50 cy, Engineer/Architect may waive strength test if adequate evidence of satisfactory strength is provided.

- f. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
 - g. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.
- C. **Compressive Strength Test Reporting.** Test results will be reported in writing to Engineer/Architect, Ready-Mix producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.
- D. **Flatness and Levelness.** Conduct random tests for flatness and levelness in accordance with ASTM E 1155 within 24 hours after final finish and as directed. Pay the cost for testing and any retesting of the areas found not to conform to the specifications after the Contractor has corrected the defects.
- E. **Floor Slope.** Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having required slope within 24 hours after final finish and as directed.
- F. **Nondestructive Testing.** Impact hammer, ultrasonic pulse velocity, or other nondestructive device may be permitted if approved, but shall not be used as the sole basis for acceptance or rejection.
- G. **Additional Tests.** The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure. These tests shall be as directed. Testing service shall conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Be responsible for all costs associated with such tests.

3.6 DEMONSTRATION

- A. **General.** Prior to final acceptance of concrete work, demonstrate to representatives of the Owner and the Engineer/Architect that there are no mechanical defects or damaged areas and that concrete exposed to view is acceptable as to function and appearance.
- 1. **Walls and Other Formed Surfaces.** Representatives of the Owner, Contractor, and Engineer/Architect shall review concrete work to verify that tie holes and air voids have been patched, seams have been ground smooth, all surface defects have been repaired, and all rubbed or rubbed and painted surfaces are acceptable in appearance.

2. Floors. Representatives of the Owner, Contractor, and Engineer/Architect shall review concrete work to verify that all surface defects have been repaired, all stains removed, residue from floor sealer/dustproof or chemical hardener has been removed, and that the required finish is acceptable. Where requested, flood selected areas of floor to a depth satisfactory to demonstrate that the area or areas drain properly to the floor drains and sumps and that there are no areas ponding water outside acceptable tolerances. Furnish water for testing and convey it to the areas being examined.
3. Liquid-Bearing Structures. All structures designed to hold water or other liquids shall be demonstrated to be watertight in accordance with ACI 350.

B. **Repair or Replacement of Defective Work.** Correct concrete work which is unacceptable in accordance with paragraph 3.4 of this section entitled "Concrete Surface Repairs." Remove concrete which, in the opinion of the Engineer/Architect, cannot be repaired satisfactorily and replace in an acceptable manner at no additional cost to the Owner.

3.7 CONCRETE CURING AND PROTECTION

- A. **General.** Protect freshly placed concrete from premature drying and excessively cold or hot temperatures. In hot, dry, and windy weather, protect concrete from rapid moisture loss before and during finishing operations with an evaporation control compound. Apply in accordance with manufacturer's instructions.
- B. **Curing Duration.** Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Keep continuously moist for not less than 7 days. Maintain concrete temperatures as recommended in ACI 301 throughout the curing period.
- C. **Curing Methods.** Perform curing of concrete by curing compound, by moist curing, by moisture-retaining-cover curing, and by combinations thereof in accordance with the schedule below unless curing method is specifically noted on the drawings. If unspecified, Contractor may opt for any of the methods specified below. Prior to use of curing compound on any surface, verify compatibility between curing compound and finish surface treatment.

Location	Curing Method
Floors and other unformed concrete surfaces	Any specified curing method
Formed concrete surfaces	Moist curing prior to form removal, followed by any of the methods specified below
Slabs to receive grout topping	Moisture cure
All other concrete	Any specified curing method

1. Moisture Curing. Provide moisture curing by following methods:
 - a. Keep concrete surface continuously wet by covering with water.
 - b. Use continuous water fog spray.

- c. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4-inch lap over adjacent absorptive covers.
2. Moisture-Retaining-Cover Curing. Provide moisture-cover curing as follows:
- a. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. Curing Compound. Provide curing compound as follows:
- a. Apply specified curing compound to concrete as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared). For formed surfaces, apply curing compound immediately after form removal. Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's directions. Apply in two coats, spread in perpendicular directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - b. Use curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.
 - c. Do not use curing compounds on surfaces which are to be covered with coating material applied directly to concrete, chemical hardener, waterproofing, dampproofing, membrane roofing, flooring (such as ceramic or quarry tile, glue down carpet that is not compatible with curing compound), painting, and other coatings and finish materials, unless otherwise approved.

3.8 **SHORES AND SUPPORTS.** Comply with ACI 347 for shoring and reshoring in multistory construction, and as herein specified.

- A. **Extend shoring from ground to roof** for structures four stories or less, unless otherwise permitted.
- B. **Extend shoring at least three floors** under floor or roof being placed for structures over four stories. Shore floor directly under floor or roof being placed, so that loads from construction above will transfer directly to these shores. Space shoring in stories below this level in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members where no reinforcing steel is provided. Extend shores beyond minimums to ensure proper distribution of loads throughout structure.
- C. **Remove shores and reshore** in a planned sequence to avoid damage to partially cured concrete or to supporting floors. Locate and provide adequate reshoring to support work without excessive stress or deflection.

- D. **Keep reshores in place** a minimum of 15 days after placing upper tier, and longer if required, until concrete has attained its required 28-day strength and heavy loads due to construction operations have been removed.

3.9 REMOVAL OF FORMS

- A. **Formwork which is not supporting** the weight of concrete, such as sides of beams, walls, columns, and similar parts of the work may be removed after cumulatively curing at not less than 50° F. (10° C.) for 24 hours after placing concrete, provided concrete is sufficiently hard not to be damaged by form removal operations, and provided curing and protection operations are maintained.
- B. **Formwork supporting weight** of concrete, such as beam soffits, joists, slabs, and other structure elements, may not be removed in less than 14 days and until concrete has attained at least 75 percent of design minimum compressive strength at 28 days. Determine potential compressive strength of in-place concrete by testing field cured specimens representative of concrete location or members.
- C. **Form facing material may be removed** 3 days after placement only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

3.10 PROTECTION OF FORMED AND UNFORMED CONCRETE SURFACES.

Protect concrete from damage or discoloration during the construction period caused by subsequent work performed by all other trades, including, but not limited to, concrete forming, resteel placement, equipment installation, plumbing work, electrical work, construction loading to the point of overstressing concrete, and all other actions which might adversely affect the strength or appearance of the concrete. Repair of chipped or damaged concrete and removal of rust, stains, efflorescence, and surface deposits shall be accomplished by acceptable methods.

END OF SECTION

SECTION 05 00 00

GRATING AND MISCELLANEOUS METALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** Provide the labor, tools, equipment, and materials necessary to furnish and install the miscellaneous metals in accordance with the drawings and the specifications. This specification does not include other division 5 specification, including Fixed metal ladders (05 51 10), Structural Steel (05 10 00), pipe tube and railings (05 52 13) and others.

1.3 QUALITY ASSURANCE

- A. **Fabricator Qualifications.** Fabrication shall meet requirements of the American Institute of Steel Construction (AISC) standards.
- B. **Standards.** Ensure that materials and workmanship are in accordance with the following standards referenced herein.
 - 1. AASHTO – American Association of State Highway and Transportation Officials.
 - 2. AISC.
 - 3. ASTM – American Society for Testing and Materials.
 - 4. AWS – American Welding Society.
 - 5. OSHA – Occupational Safety and Health Administration.

1.4 SUBMITTALS

- A. **Submit the following** in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.
- B. **Submittal Package No. 1 – Shop Drawings and Product Data**
 - 1. Schedule. No products shall be delivered or installed before this submittal package has been reviewed and approved.
 - 2. Submittal Package Contents.
 - a. Manufacturer's name and model numbers.
 - b. Manufacturer's standard product data and equipment specifications.
 - c. Materials of construction.
 - d. Dimensional layouts and required clearances.
 - e. Connections including welding.

- f. Weights.
- g. Anchors.
- h. Bill of material.
- i. Coatings.
- j. Complete description in sufficient detail to permit an item by item comparison with the specifications.
- k. Manufacturer's instructions.
- l. Warranties.

1.5 JOB CONDITIONS

- A. **Field-verify all dimensions, locations, and elevations** of anchors, bolts, plates, openings, and other miscellaneous metal items and be responsible for their proper fit.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. **In accordance with Section 01 60 00 "Materials and Equipment"** and the manufacturer's instructions.

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.1 GENERAL

A. Design

- 1. Proportion components not sized on the plans to provide ample strength and stiffness for the loads expected.
- 2. All steel shall meet the requirements of ASTM A 36.
- 3. All cast iron shall meet the requirements of ASTM A 48.

- B. **Fabrication.** Fabricate the miscellaneous metals in accordance with the approved shop drawings.

2.2 EQUIPMENT

A. Chains

- 1. Multiple row of 1/4 inch, Type 304 all-welded stainless steel.
- 2. Type 316 stainless steel swivel safety snap at each end.
- 3. Type 316 stainless steel eye bolt to the railing or wall.

B. Gratings

- 1. Aluminum.
 - a. Type 6063 aluminum, rectangular pressure lock type with cross bars flush with the walking surface.

- b. Bearing bars shall be not less than 3/16 inch thick with a minimum depth of 1-1/4 inches and spaced not greater than 1-3/16 inches on center.
 - c. Cross bars shall be 3/4 inch x 1/8 inch spaced 4 inches on center.
2. Design Loading.
- a. Uniform load of 300 pounds per square foot with a deflection of not more than 1/160 of the span, unless otherwise shown.
 - b. Depths noted are minimum; increase depth of grating and support angle as required to meet design loading.
 - c. Uniform depth in any one area.
3. Supports.
- a. Support gratings on all four sides by an angle of the same material as the grating.
 - b. Securely anchor angle supports.
 - c. Where the support angle extends across an opening, supplement the support angle with a structural channel.
 - d. Channel, unless noted otherwise, shall be of the same material as the grating and not less than 3 inches in depth.
4. Banding. Band edges and openings in the gratings with a bar equal to the bearing bar. Provide 1/8 inch thick cover plate with pegs to prevent movement for each opening.
5. Setting.
- a. Set gratings flush with the finished surface.
 - b. Secure gratings to their supports by removable anchors.
 - c. Set anchors every 4 feet 0 inches on center but not less than two anchors per each section of grating.
 - d. Clip gratings with a span over 4 feet together.

C. Planking

- 1. Materials. Type 6063-T6 aluminum, unpunched, solid surface with horizontal ribbing.
- 2. Design Loading. Design planking for a uniform load of 300 pounds per square foot with a deflection of not more than 1/160 of the span, unless otherwise shown.
- 3. Supports.
 - a. Support planking on all four sides by an angle of the same material as the planking.
 - b. Securely anchor angle supports.
 - c. Where the support angle extends across an opening, supplement the support angle with a structural channel.
 - d. Channel, unless noted otherwise, shall be of the same material as the planking and not less than 3 inches in depth.

4. Banding. Band edges and openings in planking with a bar equal to the bearing bar. Provide 1/8 inch thick cover plate with pegs to prevent movement for each opening.
5. Setting. Planking shall be set flush with the finished surface, and the planking shall be of uniform depth in any one area.
6. Subject to compliance with the specifications, provide the planking from one of the following approved manufacturers.
 - a. IKG Borden HD Style P.
 - b. Or equal.

D. Floor Plate Covers. Conform to ASTM A 786 made of A283 Grade D or A36 steel.

E. Structural Shapes

1. Structural shapes including all lintels shall be ASTM A 36 steel, hot-dipped galvanized, unless noted otherwise.
2. Lintels. Minimum 8 inch bearing on each side of the opening, unless noted otherwise.
3. Other. All structural shapes other than lintels shall be as required to complete the work. All anchors, connections, bearing plates, and fabrication details shall be standard, unless otherwise noted.

F. Stairs

1. All stair treads, stringers, railings, angles, landings, anchors, clips, and supports as shown.
2. Designed to meet local, state, and OSHA requirements with a safety factor of 4.
3. Weld bent stringers to develop strength of section.
4. Continuously weld 3/16 inch closure plate to exposed ends of stringers.

G. Flumes, Baffles, and Weirs

1. Flumes, baffles, and weirs shall be of the size, shape, and material shown.
2. Weld and grind smooth all joints.
3. Provide watertight expansion joints as shown.

H. Weir Plates, Stop Plates, and Guide Frames

1. Unless drawing references Section 13 00 40, fabricate all weir plates, stop plates, and guide frames aluminum alloy 6061-T6 or equivalent, with mill finish, of the sizes and shapes shown.
2. Guide frames shall be straight and true, extruded construction, with all corners mitered, welded, and ground smooth.
3. Fit guide frames with ultra high molecular weight polyethylene seals at all points of contact.
4. Continuously secure seals with dovetail or dado joint.
5. Guide frame shall weigh a minimum of 1.5 pounds per foot.

6. Stiffen plates with structural shapes, welded in place, as required to keep the maximum deflection below 1/360 of the span under the loads developed from maximum head conditions.
 7. Plates and frames shall be by the same manufacturer.
- I. **Staff Gauges.** Staff gauges shall be Type 6061-T6 aluminum as shown. Numbers shall be Futura Style, 1-1/2 inches high.
- J. **Fasteners for aluminum or stainless steel** shall be Type 316 stainless steel.
- K. **Anchor Bolts.** In accordance with Section 05 05 23 "Anchors."
- L. **Ladders.** Ladders as shown with all anchors, bolts, and necessary appurtenances. Weld and grind smooth all joints.
- M. **Stair Nosings**
1. Provide all concrete stairs with antislip stair nosings.
 2. Stair nosings shall be extruded aluminum with four alternating ribs of abrasive grit.
 3. Abrasive grit shall be not less than 19 ounces of aluminum oxide per square foot of nosing.
- N. **Stair Treads**
1. Grating Type. Galvanized steel with 1-1/4 inch x 3/16 inch bearing bars at 1-3/16 inches on center with nonskid nosing.
 2. Concrete-Filled Steel Pan. 14 gauge steel continuously welded to stringers.
- O. **Covers and Frames**
1. Access Openings. Covers and frames for access openings shall be cast iron or mill-finish aluminum of the size, type, and style as shown. All hardware for aluminum access doors shall be Type 316 stainless steel.
 2. Pipe Openings. Covers and frames for pipe openings shall be 1/4 inch aluminum plate set in an aluminum bar frame. Covers shall be split ring type for installed pipe and solid for openings of future pipe.
 3. Expansion Joints.
 - a. Flush Type. Cover and frame for expansion joints shall be flush type, extruded aluminum frame with 1/4 inch aluminum cover plate and neoprene insert.
 - b. Surface Type. Cover for expansion joints shall be preformed aluminum shapes with tapered edges, anchored on one side only. Anchors shall be stainless steel, flat head type, set flush, 12 inches on center.
- P. **Access Steps**
1. Steps shall conform to the requirements of ASTM C 478, AASHTO M-199, and as shown.
 2. Each step shall consist of a 1/2 inch Grade 60 deformed reinforcing bar encapsulated in polypropylene.

- a. The polypropylene shall conform to ASTM D 4101.
 - b. The reinforcing bar shall conform to ASTM A 615.
3. Do not exceed 24 inches between the top of opening and the first step.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. **Take field measurements** prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.

3.2 PREPARATION

- A. **Coordinate and furnish anchorages**, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, sleeves, anchor rods, and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

3.3 GENERAL

A. Fasteners

1. Conceal fasteners where practical.
2. Countersink all bolts, properly sized, and of proper length to permit full thread in the nut and project not more than a 1/4 inch beyond the nut.
3. Provide lock washers at all nuts and nick the bolt to prevent loosening.
4. All welds shall be smooth and regular, solid, and homogeneous throughout and free from pits, slag, scale, and other defects.
5. Make joints exposed to weather watertight with gaskets or continuous welding.
6. Grind smooth all welds in exposed finished work.

- B. **Holes.** Drill or punch all holes with clean, true lines and surfaces.

C. Welding

1. Unless otherwise shown, all welding shall be continuous along all adjoining planes and shall produce a neat, even finish and smooth appearance.
2. Conform to welding requirements of AWS.
3. For all welding of aluminum use inert-gas shielded-arc method conforming to AWS D1.2.
4. Weld stainless steel conforming to materials and procedures set forth in "The Procedure Handbook of Arch Welding" by Lincoln Electric Co. or other approved procedures.

D. Galvanizing

1. Where galvanized or zinc coated is called for, it shall be hot dipped after fabrication in accordance with the standard specifications of the Hot Dip Galvanizers Association.
 2. Do not paint galvanized metal, unless otherwise noted.
 3. Coat all abraded areas, welds, or holes drilled in the field with a zinc-rich paint.
- E. **Painting.** Unless otherwise noted, see Section 09 90 00 "Painting," for miscellaneous metal coating.
- F. **Anchors.** Coat all ferrous anchors that are not galvanized with an asphaltic paint prior to installation.
- G. **Aluminum.** Isolate all aluminum in contact with concrete, masonry, or dissimilar metals by coating the contact surfaces with a two-part water-based, gray epoxy primer.

3.4 INSTALLATION

- A. **Fabricate and install** the miscellaneous metals specified herein as shown and in accordance with approved shop drawings and the manufacturer's recommendations.

END OF SECTION

SECTION 05 05 23

ANCHOR BOLTS, EXPANSION ANCHORS, AND ADHESIVE ANCHORS AND DOWELS

PART 1 - GENERAL

- 1.1 **RELATED DOCUMENTS.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.
- 1.2 **DESCRIPTION OF WORK.** Provide all labor, materials, tools, and equipment necessary to furnish and install the anchor rods, expansion anchors, and adhesive anchors and dowels in accordance with the drawings and as specified herein.
- 1.3 **QUALITY ASSURANCE**
 - A. **Standards.** Ensure that materials and workmanship are in conformance with the following standards as referenced herein:
 1. AISI – American Iron and Steel Institute.
 2. ASTM – American Society for Testing and Materials.
 - B. **Installer Training.** Conduct a thorough training with the manufacturer or the manufacturer's representative. Training to consist of a review of the complete installation process for drilled-in anchors, to include but not limited to:
 1. Hole drilling procedure.
 2. Hole preparation and cleaning technique.
 3. Adhesive injection technique and dispenser training/maintenance.
 4. Rebar dowel preparation and installation.
 5. Proof loading/torquing.
- 1.4 **SUBMITTALS.** Submit the following submittals in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.
 - A. **Submittal Package No. 1 – Shop Drawings, Product Data, and Design Criteria**
 1. Schedule. No products shall be delivered or installed before this submittal package has been reviewed and approved.
 2. Submittal Package Contents.
 - a. Copies of manufacturer's specifications, load tables, data, and dimension diagrams for the devices including manufacturer's recommended working load for each size and type of anchor proposed for use.
 - b. Certification that materials conform to ASTM specifications.
 - c. Certification that products conform to requirements of Underwriters' Laboratory or Factory Mutual.

- d. Setting drawings and templates for location and installation of anchorage devices.
- e. Anchor rods and bolts showing dimensions and material of construction.
- f. When the size, length, or load carrying capacity of an anchor rod, expansion anchor, and adhesive anchor is not shown on the drawings, provide the size, length, and capacity required to carry the design load times a minimum safety factor of four.
- g. Design Loads. Those imposed by the service conditions and as follows:
 - 1) Equipment Anchors. Use the design load recommended by the equipment manufacturer and accepted by the Owner or Engineer.
 - 2) Allowances for vibration are included in the safety factor specified above.
- h. Design Data. Provide design load documentation and calculations for items sized or selected.
- i. Installation instructions for adhesive anchors.

B. Submittal Package No. 2 – Samples

- 1. Schedule. No equipment shall be delivered or installed before this submittal package has been reviewed and approved.
- 2. Submittal Package Contents. Two samples of each type anchor and its components. Samples of anchor rods will not be required.

1.5 **JOB CONDITIONS** (Not used)

1.6 **DELIVERY, STORAGE, AND HANDLING**

- A. **Delivery.** Clearly mark all items according to purpose and intended location.
- B. **Storage and Handling.** Store and handle all items in accordance with the manufacturer's recommendations, but in no case exposed to the weather.

1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

2.1 MATERIALS/MANUFACTURERS

A. Threaded and Nutted Anchor Rods

- 1. In accordance with ASTM A 276, AISI Type 316.
- 2. Nuts in accordance with ASTM F 594, Group 2, and tack-welded to anchor rod.

B. Cracked Concrete Anchors

1. Provide cracked concrete anchors where International Building Code (IBC) 2015 is the design code and specified on the drawing details. Anchors that are approved for "cracked concrete" situations shall meet the requirements stated in ACI-318-14 Chapter 17.
2. Manufacturers. Subject to compliance with the specifications, provide cracked concrete anchors from one of the following approved manufacturers.
 - a. Expansion Anchors
 - 1) Simpson Strong-Tie, Strong-Bolt 2.
 - 2) Hilti, Inc., Kwik-Bolt-TZ.
 - 3) Simpson Titan-HD.
 - 4) Hilti HSL-3.
 - 5) Hilti HDA.
 - b. Adhesive Anchors
 - 1) Simpson Strong-Tie SET-XP
 - 2) Hilti HIT-RE 500 V3.

C. Expansion Anchors

1. Provide stainless steel expansion anchors, nuts, and washers complying with ASTM A 276, AISI Type 316.
2. Expansion anchors shall be Underwriters' Laboratories, Factory Mutual, or International Code Council – Evaluation Service (ICC-ES) report approved.
3. Subject to compliance with the specifications, provide expansion anchors from one of the following approved manufacturers.
 - a. Simpson Strong-Tie, Wedge-All.
 - b. Wej-it Corporation.
 - c. Hilti, Inc., Kwik-Bolt 3.
 - d. Ramset Company, Red Head, Trubolt.

D. Adhesive Anchors

1. Provide adhesive cartridge as recommended by the manufacturer for the loading and depth required.
2. Provide Type 316 stainless steel threaded rod, nut, and washer or a reinforcing bar of the size and embedment shown on the drawings and in accordance with ASTM A 615, Grade 60.
3. Subject to compliance with the specifications, provide adhesive cartridges from one of the following approved manufacturers.

- a. Simpson Strong-Tie, SET Epoxy.
- b. Simpson Strong-Tie, AT Acrylic Adhesive.
- c. Hilti, HIT-HY 200.
- d. ITW/Red Head, C6+ Epoxy.
- e. Hilti HIT-RE 500 V3.

E. Adhesive-Anchored Reinforcing Bar.

- 1. Provide adhesive cartridges as recommended by the manufacturer to receive reinforcing bar as noted.
- 2. Manufacturer/Model. Subject to compliance with the specifications, provide adhesive cartridges from one of the following approved manufacturers.
 - a. Simpson Strong-Tie, SET Epoxy.
 - b. Simpson Strong-Tie, AT Acrylic Adhesive.
 - c. Hilti HIT-RE 500 V3.
 - d. ITW/Red Head, C6+ Epoxy.
 - e. Hilti HIT-HY 200.
- 3. Reinforcing Bar. Comply with Section 03 30 00.

F. Powder-Actuated Fasteners. Do not use powder-actuated fasteners and other types of bolts and fasteners.

PART 3 - EXECUTION

3.1 **EXAMINATION.** Examine conditions under which rods, bolts and anchors are to be installed, and notify the Engineer in writing of unsatisfactory conditions existing. Do not proceed with the work until unsatisfactory conditions or deficiencies have been corrected.

3.2 **PREPARATION.** Notify the Engineer prior to the installation of all adhesive anchors.

3.3 INSTALLATION

- A. **Do not install** anchor rods, expansion anchors, or adhesive anchors until the item to be anchored and the anchoring device as well as related layout drawings have been accepted.
- B. **Drilling and setting equipment** used and installation of expansion anchors and adhesive anchors shall be in accordance with manufacturer's instructions.
- C. **Drill holes to depth** and diameter recommended by manufacturer.
- D. **Clean all holes** for adhesive anchors in strict accordance with the manufacturer's instructions.
- E. **Use the type of anchoring** device shown.
- F. **Unless otherwise shown,** conform to following for expansion anchors.

1. Minimum embedment depth in concrete – 5 diameters.
2. Minimum anchor spacing on centers – 10 diameters.
3. Minimum distance to edge of concrete – 5 diameters.
4. Increase dimensions above if required to develop the required anchor load capacity.

G. **Unless otherwise shown**, conform with the manufacturer's recommendations for minimum embedment depth, minimum anchor spacing, and minimum edge distance for adhesive anchors except that minimum embedment depth in concrete shall not be less than 4 inches unless noted otherwise.

H. **Use copper-graphite antiseize** compound for all anchor nuts. Thoroughly lubricate all threaded fasteners with compound prior to assembly. Remove excess lubricant after fastener installation.

3.4 FIELD QUALITY CONTROL

A. **Inspection.** Inspect each installation for compliance with this specification and manufacturer's recommendations.

B. **Testing.** At the discretion of the Owner, adhesive anchors may be subjected to pullout-type testing up to the manufacturer's recommended working load for the anchor. If deficient anchors are found, the Contractor will be required to test all anchors and replace any deficient anchors found at no additional cost to the Owner.

C. **Material Testing**

1. At the discretion of the Owner up to 1 percent or up to three (whichever is greater) of each type and size of bolt, nut, washer, and anchor from each and every separate shipment or purchasing lot that are specified to be Type 316 stainless steel may be destructively tested to verify material requirements.
2. Samples will be randomly selected for this testing and be provided at no additional cost to the Owner.
3. Conduct testing at the Owner's expense.
4. The above testing may be performed at any time during the Contract or warranty period.
5. Any shipment or purchasing lot, installed or not, which fails to meet the requirements of the specifications will be rejected and shall be immediately removed from the job site and replaced with material that meets the specifications.
6. Removal and replacement of noncomplying material shall be at the Contractor's expense.

3.5 **CLEANING.** After embedding concrete is placed, remove protection and clean rods, anchors, and inserts.

END OF SECTION

SECTION 05 10 00

STRUCTURAL STEEL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** The Contractor shall provide the labor, tools, equipment, and materials necessary to furnish and install the structural steel in accordance with the plans and as specified herein.
- B. **Types.** This section includes fabrication and erection of structural steel work, as shown on drawings including schedules, notes, and details showing size and location of members, typical connections, and types of steel required.
 - 1. Structural steel is that work defined in American Institute of Steel Construction (AISC) "Code of Standard Practice" and as otherwise shown on drawings.
 - 2. Miscellaneous metal fabrications are specified elsewhere in Division 5.
 - 3. Refer to Division 3 for anchor bolt installation in concrete and Division 4 for anchor bolt installation in masonry.

1.3 QUALITY ASSURANCE

- A. **Codes and Regulatory Agencies.** Perform all work to furnish and install the structural steel in compliance with all federal, state, and local codes and regulatory agencies. Comply with provisions of following, except as otherwise indicated:
 - 1. AISC "Code of Standard Practice for Steel Buildings and Bridges."
 - a. Paragraph 4.2.1 of the above code is hereby modified by deletion of the following sentence:
 - 1) "This approval constitutes the owner's acceptance of all responsibility for the design adequacy of any detail configuration of connections developed by the fabricator as a part of his preparation of these shop drawings."
 - 2. AISC "Specifications for Structural Steel Buildings," including "Commentary."

3. "Specifications for Structural Joints Using American Society for Testing and Materials (ASTM) A 325 or A 490 Bolts" approved by the Research Council on Structural Connections.
 4. ASTM A 6 "General Requirements for Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use."
- B. **Qualifications for Fabricator.** Fabricator shall have a current "AISC Quality Certification Category II."
- C. **Qualifications for Welding Work.** Qualify welding procedures and welding operators in accordance with American Welding Society (AWS) "Qualification" requirements.
1. If recertification of welders is required, retesting will be Contractor's responsibility.

1.4 SUBMITTALS

- A. **General.** Submit the following in accordance with Conditions of Contract and Division 1 specification sections.
- B. **Product Data.** Product data or manufacturer's specifications and installation instructions for following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).
1. Structural steel primer paint.
 2. Shrinkage resistant grout.
- C. **Shop drawings prepared under supervision** of a licensed Professional Engineer, including complete details and schedules for fabrication and assembly of structural steel members, procedures, and diagrams.
1. Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS symbols and show size, length, and type of each weld.
 2. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed as work of other sections.
- D. **Test reports conducted on field-bolted** and welded connections. Include data on type(s) of tests conducted and test results.
- E. **Certified copies of each survey** conducted by a licensed Land Surveyor, showing elevations and locations of base plates and anchor bolts to receive structural steel and final elevations and locations for major members. Indicate discrepancies between actual installation and Contract Documents.
- F. **Provide certification** that welders to be employed in work have satisfactorily passed AWS qualification tests.

1.5 JOB CONDITIONS

- A. **General.** Deliver materials to site at such intervals to ensure uninterrupted progress of work.
- B. **Deliver anchor bolts** and anchorage devices which are to be embedded in cast-in-place concrete or masonry in ample time as not to delay work.
- C. **Store materials to permit easy access** for inspection and identification. Keep steel members off ground by using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration. If bolts and nuts become dry or rusty, clean and relubricate before use.
 - 1. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.6 DELIVERY, STORAGE, AND HANDLING

Not used.

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. **Structural Steel Wide Flange Shapes.** ASTM A 992.
- B. **All Other Structural Steel Shapes, Plates, and Bars.** ASTM A 36 unless noted otherwise.
- C. **Cold-Formed Steel Tubing.** ASTM A 500, Grade B.
- D. **Steel Pipe.** ASTM A 53, Type E or S, Grade B; or ASTM A 501.
 - 1. Finish. Black, except where indicated to be galvanized.
- E. **Steel Castings.** ASTM A 27, Grade 65-35, medium strength carbon steel.
- F. **Anchor Bolts and Threaded Rods.** ASTM F 1554, Grade 36 headed type unless otherwise indicated.
- G. **Unfinished Threaded Fasteners.** ASTM A 307, Grade A, regular low carbon steel bolts and nuts.
 - 1. Provide hexagonal heads and nuts for all connections.
- H. **High-Strength (and Alternate Fastener Design) Threaded Fasteners.** Heavy hexagonal structural bolts, heavy hexagonal nuts, and hardened washers, as follows:

1. Quenched and tempered medium carbon steel bolts, nuts, and washers, complying with ASTM A 325.
 - a. Where indicated as galvanized, provide units that are zinc coated, either mechanically deposited complying with ASTM B 695, Class 50, or hot dip galvanized complying with ASTM A 153.

- I. **Direct Tension Indicators.** ASTM F 959, type as required.
 1. Use on all A 325 bolts in connections that are slip critical.

- J. **Electrodes for Welding.** Comply with AWS Code.

- K. **Structural Steel Primer Paint.** Where noted, Steel Structures Painting Council (SSPC) - Paint 2 oil alkyd unless specified otherwise in Section 09 90 00, "Painting."

- L. **Galvanizing.** Structural shapes shall be hot dip galvanizing after fabrication unless otherwise noted and it shall be done in accordance with ASTM A 123. See Section 05 05 14.

- M. **Nonmetallic, Shrinkage Resistant Grout.** Premixed, nonmetallic, noncorrosive, nonstaining product containing selected silica sands, Portland cement, shrinkage compensating agents, plasticizing, and water reducing agents, complying with ASTM C 1007.
 1. Available Products. Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a. Sure Grip Grout; Dayton Superior.
 - b. Euco N.S.; Euclid Chemical Co.
 - c. Crystex; L & M Construction Chemicals, Inc.
 - d. Masterflow 713; Master Builders.
 - e. Sealtight 588 Grout; W. R. Meadows.
 - f. Five Star Grout; U.S. Grout Corp.

2.2 FABRICATION

- A. **Shop-Fabrication and Assembly.** Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings. Provide camber in structural members where indicated.
 1. Properly mark and match mark materials for field assembly. Fabricate for delivery sequence that will expedite erection and minimize field handling of materials.
 2. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.

- B. **Remove all surface blemishes** including rust and scale seam marks, roller marks, rolled trade names, and roughness by grinding, or by welding and grinding, prior to cleaning, treating, and applying surface finishes to steel which is exposed to view.
- C. **Anchor Bolts.** Provide anchor bolts where indicated on the drawings.
- D. **Connections.** Weld or bolt shop connections, as indicated.
 - 1. Provide high strength threaded fasteners for all bolted connections, except where unfinished bolts are indicated.
 - 2. Design connections to develop 55 percent of the load capacity of the member as tabulated in the beam tables, Part 2, of the AISC "Manual of Steel Construction" unless reactions or specific details are shown.
 - 3. Connections for bracing shall be designed to develop full strength of bracing members unless forces are shown.
- E. **Bolt field connections,** except where welded connections or other connections are indicated.
- F. **High-Strength Bolted Construction.** Install high strength threaded fasteners in accordance with AISC "Specifications for Structural Joints Using ASTM A 325 or A 490 Bolts."
- G. **Welded Construction.** Comply with AWS code and appearance requirements specified herein.
- H. **Steel Wall Framing.** Select members that are true and straight for fabrication of steel wall framing. Straighten as required to provide uniform, square, and true members in completed wall framing.
- I. **Build up welded door frames** attached to structural steel framing. Weld exposed joints continuously and grind smooth. Plug weld steel bar stops to frames, except where shown removable. Secure removable stops to frames with countersunk, cross recessed head machine screws, uniformly spaced not more than 10 inches on center (o.c.), unless otherwise indicated.
- J. **Holes for Other Work.** Provide holes required for securing other work to structural steel framing and for passage of other work through steel framing members.
- K. **Provide threaded nuts** welded to framing and other specialty items as indicated to receive other work.
- L. **Cut, drill, or punch holes** perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

2.3 SHOP PAINTING

- A. **General.** Shop-paint structural steel, except those members or portions of members to be embedded in concrete or mortar. Paint embedded steel that is

partially exposed on exposed portions and initial 2 inches of embedded areas only.

1. Do not paint surfaces to be welded or high strength bolted with friction type connections.
2. Do not paint surfaces scheduled to receive sprayed-on fireproofing.
3. Apply two coats of paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

B. **Surface Preparation.** After inspection and before shipping, clean steelwork to be painted. Remove loose rust, loose mill scale, and spatter, slag, or flux deposits. Clean steel in accordance with SSPC as follows:

1. SP-6 "Commercial Blast Cleaning," unless specified otherwise in Section 09 90 00, "Painting."

C. **Painting.** If not specified otherwise in Section 09 90 00, "Painting," immediately after surface preparation, apply structural steel primer paint in accordance with manufacturer's instructions and at a rate to provide dry film thickness of not less than 1.5 mils. Use painting methods that result in full coverage of joints, corners, edges, and exposed surfaces.

2.4 SOURCE QUALITY CONTROL

A. **General.** Materials and fabrication procedures are subject to inspection and tests in mill, shop, and field, conducted by a qualified inspection agency. Such inspections and tests will not relieve Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements.

1. Promptly remove and replace materials or fabricated components that do not comply.

B. **Design of Members and Connections.** Details shown are typical; similar details apply to similar conditions, unless otherwise indicated. Verify dimensions at site whenever possible without causing delay in the work.

1. Promptly notify Engineer/Architect whenever design of members and connections for any portion of structure are not clearly indicated.
2. For connections not detailed on the plans and unless specific reactions, moments, shears, and axial forces are indicated, provide beam connections designed for the reaction due to the maximum uniform load which the beam can support at the span shown. Use the beam tables in the AISC "Manual of Steel Construction, Allowable Stress Design."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. **Surveys.** Employ a licensed Land Surveyor for accurate erection of structural steel. Report discrepancies to Engineer/Architect. Do not proceed with erection until corrections have been made or until compensating adjustments to structural steelwork have been agreed upon with Engineer/Architect.
1. Check elevations of concrete and masonry bearing surfaces and location of anchor bolts and similar devices.
 2. Check camber and sweep of structural members and compare to permissible variations in AISC "Manual of Steel Construction."
 3. Check levelness and elevations of leveling plates and bearing plates.
- B. **Examine all structural steel** and discard all damaged members.

3.2 PREPARATION

- A. **Anchor Bolts.** Provide anchors as to not delay work.
1. Provide setting drawings to ensure accurate placement.
- B. **Temporary Shoring and Bracing.** Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds and to resist wind and earthquake loads.
- C. **Temporary Planking.** Provide temporary planking and working platforms as necessary to effectively complete work.
- D. **Setting Bases and Bearing Plates.** Clean concrete and masonry bearing surfaces of bond reducing materials and roughen to improve bond to surfaces. Clean bottom surface of base and bearing plates.
1. Set loose and attached base plates and bearing plates for structural members on wedges or other adjusting devices.
 2. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.
 3. Pack grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.
 4. For proprietary grout materials, comply with manufacturer's instructions.

3.3 ERECTION

- A. **General.** Comply with Occupational Safety and Health Administration (OSHA) and state safety requirements.

- B. **Field-Assembly.** Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces that will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
- C. **Straightening of structural steel sections** by heating shall not be permitted unless approved by Engineer/Architect.
- D. **Level and plumb individual members** of structure within specified AISC tolerances.
- E. **Splice members** only where indicated and accepted on shop drawings.
- F. **Erection Bolts.** On exposed welded construction, remove erection bolts, fill holes with plug welds, and grind smooth at exposed surfaces.
 - 1. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
 - 2. Do not enlarge unfair holes in members by burning or by using drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.
- G. **Gas Cutting.** Do not use gas cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only on secondary members that are not under stress, as acceptable to Engineer/Architect. Finish gas cut sections equal to a sheared appearance when permitted.
- H. **Touch-Up Painting.** Unless otherwise specified in Section 09 90 00, "Painting," immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas using same material as used for shop painting.
 - 1. Apply by brush or spray to provide minimum dry film thickness of 1.5 mils.

3.4 QUALITY CONTROL

- A. **General.** Contractor will engage an independent testing and inspection agency to inspect, perform test, and prepare test reports on high strength bolted connections and welded connections. Welds will be visually inspected and some or all welds will be nondestructively tested.
- B. **Testing agency shall conduct** and interpret tests, state in each report whether test specimens comply with requirements, and specifically state any deviations from them.
- C. **Provide fabrication schedule** for testing agency so that required inspection and testing can be accomplished.

- D. **Provide access for testing agency** to places where structural steelwork is being fabricated or produced and to the construction site so that required inspection and testing can be accomplished.
- E. **Testing agency may inspect structural steel** at plant before shipment.
- F. **Testing agency will inspect structural steel** at the site.
 - 1. Field-Bolted Connections. Inspect in accordance with Research Council on Structural Connections (RCSC) "Specification for Structural Joints Using A325 or A490 Bolts."
 - a. For direct tension indicators, comply with requirements of ASTM F 959. Verify that gaps are less than gaps specified in Table 2.
 - 2. Field-Welding. Inspect and test during erection of structural steel in accordance with Section 6 of AWS D1.1.
 - a. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
 - b. Perform visual inspection of all welds.
 - c. Perform tests on 100 percent of the full and partial penetration welds as follows. Inspection procedures listed are to be used at Contractor's option.
 - 1) Liquid Penetrant Inspection. ASTM E 165.
 - 2) Magnetic Particle Inspection. ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not acceptable.
 - 3) Radiographic Inspection. ASTM E 94 and ASTM E 142; minimum quality level "2-2T."
 - 4) Ultrasonic Inspection. ASTM E 164.
 - 3. Steel Framing. Inspect and verify compliance with the details shown on the approved Contract Documents.
- G. **Correct deficiencies in structural steel work** that independent inspections and laboratory test reports have indicated to be not in compliance with Contract Documents. Perform additional tests, at Contractor's expense, as necessary to reconfirm any noncompliance of original work and to show compliance of corrected work.

END OF SECTION

SECTION 06 74 13

FIBERGLASS REINFORCED GRATINGS

PART 1 - GENERAL

- 1.1 **RELATED DOCUMENTS.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.
- 1.2 **DESCRIPTION OF WORK.** Provide all labor, materials, tools, and equipment necessary to furnish and install the fiberglass reinforced polymer (FRP) grating in accordance with the drawings and as specified herein.
- 1.3 **QUALITY ASSURANCE.** Materials and workmanship shall be in conformance with the following standards as referenced herein:
- A. **ASTM** - American Society for Testing and Materials.
- 1.4 **SUBMITTALS.** Submit the following packages in accordance with Division 1.
- A. **Submittal Package No. 1 – Product Data and Shop Drawings.**
 - 1. Product Data. Manufacturer's data on fiberglass grating.
 - 2. Shop Drawings. Shop drawings showing each fiberglass grating and fiberglass reinforced plastic curb angles.
 - B. **Submittal Package No. 2 – Samples.** Supply samples in accordance with Section 01 33 00. Submit for review one sample of the following:
 - 1. 6" x 6" sample of fiberglass grating.
- 1.5 **JOB CONDITIONS** (Not used)
- 1.6 **DELIVERY, STORAGE, AND HANDLING.** Deliver, store, and handle the FRP gratings in accordance with Section 01 60 00 and the manufacturer's instructions.
- 1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

2.1 MATERIALS

- A. **Components.**
 - 1. Fabricate the FRP grating panels from bearing bars and cross rods manufactured by the pultrusion process.
 - 2. The glass fiber reinforcement for the bearing bars shall be a core of continuous glass rovings wrapped with continuous strand glass mat.
 - 3. The bearing bars shall be safety yellow.

- B. **Resin.** The resin matrix shall be fire-retardant isophthalic polyester meeting Class 1 flame spread rating of ASTM E 84 and the self-extinguishing requirements of ASTM D 625.
- C. **Protection.** Factory coat the panels with industrial-grade polyurethane for screening out ultraviolet light.

2.2 FABRICATION

A. **Bars.**

1. Join the bearing bars into panels by passing continuous length fiberglass pultruded cross rods through the web of each bearing bar.
2. The pultruded cross rod assembly shall consist of two cross rod spacers that have notches cut into them to fit the distance between the web of each bearing bar.
3. A continuous fiberglass pultruded bar shaped section is wedged between the two cross rod spacers mechanically locking the notches in the cross rod spacers to the web of the bearing bars.
4. Achieve chemical bonding between the cross rod spacers and the bearing bar web and between the bar-shaped wedge and the two cross rod spacers locking the entire panel together to give a panel that resists twist and prevents internal movement of the bearing bars.

- B. **Nonskid.** Affix a nonskid layer of quartz grit to the top surface of all panels using a baked epoxy resin.

- C. **Sealing.** Seal all cut and machined edges with a resin compatible with the resin matrix used in the bearing bars and cross rods.

D. **Fiberglass-Reinforced Plastic Curb Angle.**

1. Fabricate fiberglass curb angles in accordance with the configuration shown.
2. The fiberglass curb angles shall be made of the same material as the fiberglass grating.
3. All sides of all openings to receive fiberglass grating shall receive the fiberglass curb angles.

2.3 MANUFACTURER AND MODEL

A. **Manufacturer**

1. Grating shall be 1-1/2-inch Duradek I-6000 as produced by AFC, Inc., a subsidiary of Morrison Molded Fiber Glass Company.
2. Alternate Gating Design. IKG Borden, Molded Type V, 1-1/2-inch square with antiskit surface.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. **Site Verification of Conditions.** Field-measure grating locations before grating fabrication.

3.2 INSTALLATION

- A. **Fiberglass Curb Angles.** Pour in place the fiberglass curb angles into the concrete so they are true, square, and level in all directions.
- B. **Hold-Downs.** The panel hold-downs and fasteners shall be Type 316 stainless steel. There shall be a minimum of four hold-downs per panel.
- C. **Cutting.** No field-cutting or drilling of grating will be permitted.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **General.** The Contractor shall provide all labor, materials, tools, and equipment necessary to furnish and apply joint sealants in accordance with the plans and as specified herein.
- B. **Work Included.** This section includes joint sealants for the following locations:
1. Exterior joints in vertical surfaces and nontraffic horizontal surfaces as indicated below:
 - a. Control and expansion joints in cast-in-place concrete.
 - b. Control and expansion joints in unit masonry.
 - c. Joints between different materials listed above.
 - d. Perimeter joints between materials listed above and frames of doors and windows.
 - e. Control and expansion joints in ceiling and overhead surfaces.
 - f. Other joints as indicated.
 2. Exterior joints in horizontal traffic surfaces as indicated below:
 - a. Control, expansion, and isolation joints in cast-in-place concrete slabs.
 - b. Joints between different materials listed above.
 - c. Other joints as indicated.
 3. Interior joints in vertical surfaces and horizontal nontraffic surfaces as indicated below:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints of exterior openings where indicated.
 - c. Joints between tops of nonload bearing unit masonry walls and underside of cast-in-place concrete slabs and beams.
 - d. Vertical control joints on exposed surfaces of interior unit masonry and concrete walls and partitions.
 - e. Joints on underside of precast beams and planks.
 - f. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.

- g. Perimeter joints of toilet fixtures.
 - h. Other joints as indicated.
4. Interior joints in horizontal traffic surfaces as indicated below:
- a. Control and expansion joints in cast-in-place concrete slabs.
 - b. Control and expansion joints in tile flooring.
 - c. Other joints as indicated.
- C. **Related Sections.** The following sections contain requirements that relate to this section:
- 1. Division 7 section "Flashing and Sheet Metal" for sealing joints related to flashing and sheet metal for roofing.
 - 2. Division 8 "Glass and Glazing" for sealants used in glazing.

1.3 QUALITY ASSURANCE

- A. **Codes.** Perform all work in compliance with all federal, state, and local codes.
- B. **Standards.** Materials and workmanship shall be in accordance with the following standards:
- 1. AAMA - American Architectural Manufacturers Association.
 - 2. ASTM - American Society for Testing and Materials.
 - 3. FS - Federal Specifications.
- C. **Regulatory Agencies.** Perform all work in compliance with the requirements of the following regulatory agencies:
- 1. ADA - Americans with Disabilities Act.
 - 2. OSHA - Occupational Safety and Health Administration.
- D. **Installer Qualifications.** Engage an experienced installer who has completed joint sealant applications similar in material, design, and extent to that indicated for project that have resulted in construction with a record of successful in service performance.
- E. **Testing Laboratory Qualifications.** To qualify for acceptance, an independent testing laboratory must demonstrate to Engineer/Architect's satisfaction, based on evaluation of laboratory submitted criteria conforming to ASTM E 699, that it has the experience and capability to conduct satisfactorily the testing indicated without delaying progress of the work.
- F. **Single-Source Responsibility for Joint Sealant Materials.** Obtain joint sealant materials from a single manufacturer for each different product required.
- G. **Preconstruction Compatibility and Adhesion Testing.** Submit to joint sealant manufacturers samples of materials that will contact or affect joint sealants for compatibility and adhesion testing as indicated below:

1. Use test methods standard with manufacturer to determine if priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Submit not less than nine pieces of each type of material, including joint substrates, shims, joint sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analysis of results to prevent delay in the progress of the work.
4. Investigate materials failing compatibility or adhesion tests and obtain joint sealant manufacturer's written recommendations for corrective measures, including use of specially formulated primers.
5. Testing will not be required when joint sealant manufacturer is able to submit joint preparation data required above that are acceptable to Engineer/Architect and are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

H. **Product Testing.** Provide comprehensive test data for each type of joint sealant based on tests conducted by a qualified independent testing laboratory on current product formulations within a 24-month period preceding date of Contractor's submittal of test results to Engineer/Architect.

1. Test elastomeric sealants for compliance with requirements specified by reference to ASTM C 920. Include test results for hardness, stain resistance, adhesion and cohesion under cyclic movement (per ASTM C 719), low temperature flexibility, modulus of elasticity at 100 percent strain, effects of heat aging, and effects of accelerated weathering.
2. Include test results performed on joint sealants after they have cured for 1 year.

I. **Preconstruction Field Testing.** Prior to installation of joint sealants, field test their adhesion to joint substrates as follows:

1. Locate test joints where indicated or, if not indicated, as directed by Engineer/Architect.
2. Conduct field tests for each application indicated below:
 - a. Each type of elastomeric sealant and joint substrate indicated.
 - b. Each type of nonelastomeric sealant and joint substrate indicated.
3. Notify Engineer/Architect 1 week in advance of the dates and times when field test will be performed.
4. Test Method. Test joint sealants by hand pull method described below:
 - a. Install joint sealants in 5-foot joint lengths using same materials and methods for joint preparation and joint sealant installation required for completed work. Allow sealants to cure fully before testing.

- b. Make knife cuts horizontally from one side of joint to the other followed by two vertical cuts approximately 2 inches long at side of joint and meeting horizontal cut at top of 2-inch cuts. Place a mark 1 inch from top of 2-inch piece.
 - c. Use fingers to grasp 2-inch piece of sealant just above 1-inch mark; pull firmly down at a 90-degree angle or more while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.
5. Report whether or not sealant in joint connected to pulled out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.
 6. Evaluation of Field Test Results. Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.4 SUBMITTALS

- A. **General.** Submit the following in accordance with Conditions of Contract and Division 1 specification sections.
 1. Product data from manufacturers for each joint sealant product required.
 - a. Certification by joint sealant manufacturer that sealants plus the primers and cleaners required for sealant installation comply with local regulations controlling use of volatile organic compounds (VOC).
 2. Samples for initial selection purposes in form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.
 3. Certificates from manufacturers of joint sealants attesting that their products comply with specification requirements and are suitable for the use indicated.
 4. Qualification data complying with requirements specified in "Quality Assurance" article. Include list of completed projects with project names addresses, names of Engineer/Architects and Owners, plus other information specified.
 5. Compatibility and adhesion test reports from elastomeric sealant manufacturer indicating that materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed to obtain adhesion.
 6. Product test reports for each type of joint sealants indicated, evidencing compliance with requirements specified.

7. Preconstruction field test reports indicating which products and joint preparation methods demonstrate acceptable adhesion to joint substrates.

1.5 JOB CONDITIONS

- A. **Coordination - Interfacing.** Coordinate with all other trades to prevent delays, errors, and omissions.
- B. **Environmental Conditions.** Do not proceed with installation of joint sealants under the following conditions:
 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer or below 40 degrees Fahrenheit (° F.) (4.4 degrees Celsius [° C.]).
 2. When joint substrates are wet.
- C. **Joint Width Conditions.** Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.
- D. **Joint Substrate Conditions.** Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. **Delivery.** Deliver materials to project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
- B. **Storage and Handling.** Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.7 SPECIAL WARRANTY

- A. **Special Installer's Warranty:** Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Two years from date of Substantial Completion.
- B. **Special Manufacturer's Warranty:** Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Three years from date of Substantial Completion.

- C. **Special warranties** specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
 - 1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
 - 2. Disintegration of joint substrates from natural causes exceeding design specifications.
 - 3. Mechanical damage caused by individuals, tools, or other outside agents.
 - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

1.8 SYSTEM PERFORMANCE REQUIREMENTS

- A. **General.** Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.
- B. **Interior Applications.** Provide joint sealants for interior applications that have been produced and installed to establish and maintain airtight continuous seals that are water resistant and cause no staining or deterioration of joint substrates.

1.9 SEQUENCING AND SCHEDULING

- A. **General.** Sequence installation of joint sealants to occur not less than 21 nor more than 30 days after completion of waterproofing, unless otherwise indicated.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. **Compatibility.** Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. **Colors.** Provide color of exposed joint sealants to comply with the following:
 - 1. Provide selections made by Engineer/Architect from manufacturer's full range of standard colors for products of type indicated.

2.2 ELASTOMERIC JOINT SEALANTS

- A. **Elastomeric Sealant Standard.** Provide manufacturer's standard chemically curing elastomeric sealants that comply with ASTM C 920 and other requirements indicated on each Elastomeric Joint Sealant Data Sheet at end of this section, including those requirements referencing ASTM C 920 classifications for Type, Grade, Class, and Uses.
1. **Additional Movement Capability.** Where additional movement capability is specified in Elastomeric Joint Sealant Data Sheet, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at time of installation and remain in compliance with other requirements of ASTM C 920 for Uses indicated.
- B. **Available Products.** Subject to compliance with requirements, elastomeric sealants that may be incorporated in the work include, but are not limited to, the products specified in the applicable paragraphs below.

2.3 SOLVENT RELEASE CURING JOINT SEALANTS

- A. **Acrylic Sealant.** Manufacturer's standard one part, nonsag, solvent release curing acrylic terpolymer sealant complying with AAMA 808.3 or FS TT-S-00230 or both, with capability when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the following percentage change in joint width existing at time of application and remain adhered to joint substrates indicated for project without failing cohesively:
1. 12-1/2 percent movement in both extension and compression for a total of 25 percent.
- B. **Butyl Sealant.** Manufacturer's standard one part, nonsag, solvent release curing, polymerized butyl sealant complying with ASTM C 1085 and formulated with minimum of 75 percent solids to be nonstaining, paintable, and have a tack free time of 24 hours or less.
- C. **Pigmented Narrow Joint Sealant.** Manufacturer's standard, solvent release curing, pigmented synthetic rubber sealant complying with AAMA 803.3 and formulated for sealing joints 3/16 inch or smaller in width.
- D. **Available Products.** Subject to compliance with requirements, solvent release curing joint sealants that may be incorporated in the work include, but are not limited to, the following:
1. Acrylic Sealant.
 - a. 60+Unicrylic, Pecora Corp.
 - b. PTI 738, Protective Treatments, Inc.
 - c. PTI 767, Protective Treatments, Inc.
 - d. Mono, Tremco, Inc.
 2. Butyl Sealant.

- a. BC-158, Pecora Corp.
 - b. PTI 757, Protective Treatments, Inc.
 - c. Sonneborn Multipurpose Sealant, Sonneborn Building Products Div., ChemRex, Inc.
 - d. Tremco Butyl Sealant, Tremco, Inc.
3. Pigmented Narrow Joint Sealant.
- a. PTI 200, Protective Treatments, Inc.

2.4 LATEX JOINT SEALANTS

- A. **General.** Provide manufacturer's standard one part, nonsag, mildew resistant, paintable latex sealant of formulation indicated that is recommended for exposed applications on interior and protected exterior locations and that accommodates indicated percentage change in joint width existing at time of installation without failing either adhesively or cohesively.
- B. **Acrylic Emulsion Sealant.** Provide product complying with ASTM C 834 that accommodates joint movement of not more than 5 percent in both extension and compression for a total of 10 percent.
- C. **Silicone Emulsion Sealant.** Provide product complying with ASTM C 834 and, except for weight loss measured per ASTM C 792, with ASTM C 920 that accommodates joint movement of not more than 25 percent in both extension and compression for a total of 50 percent.
- D. **Available Products.** Subject to compliance with requirements, latex joint sealants that may be incorporated in the work include, but are not limited to, the following:
 - 1. Acrylic Emulsion Sealant.
 - a. Bostik Findley; Chem-Calk 600.
 - b. Pecora Corporation; AC-20+.
 - c. Schnee-Morehead, Inc.; SM 8200.
 - d. Sonneborn, Division of ChemRex Inc.; Sonolac.
 - e. Tremco; Tremflex 834.
 - 2. Silicone Emulsion Sealant.
 - a. "Trade Mate Paintable Glazing Sealant," Dow Corning Corp.

2.5 TAPE SEALANTS

- A. **Tape Sealant.** Manufacturer's standard, solvent free, butyl based tape sealant with a solids content of 100 percent formulated to be nonstaining, paintable, and nonmigrating in contact with nonporous surfaces with or without reinforcement thread to prevent stretch and packaged on rolls with a release paper on one side.

- B. **Available Products.** Subject to compliance with requirements, tape sealants that may be incorporated in the work include, but are not limited to, the following:
1. Extru-Seal Tape, Pecora Corp.
 2. Shim-Seal Tape, Pecora Corp.
 3. PTI 606, Protective Treatments, Inc.
 4. Tremco 440 Tape, Tremco, Inc.
 5. MBT-35, Tremco, Inc.

2.6 PREFORMED FOAM SEALANTS

- A. **Preformed Foam Sealants.** Manufacturer's standard preformed, precompressed, impregnated open cell foam sealant manufactured from high density urethane foam impregnated with a nondrying, water repellent agent; factory produced in precompressed sizes and in roll or stick form to fit joint widths indicated and to develop a watertight and airtight seal when compressed to the degree specified by manufacturer; and complying with the following requirements:
1. Properties. Permanently elastic, mildew resistant, nonmigratory, nonstaining, and compatible with joint substrates and other joint sealants.
 2. Impregnating Agent. Manufacturer's standard.
 3. Density. Manufacturer's standard.
 4. Backing. None.
 5. Backing. Pressure sensitive adhesive factory-applied to one side with protective wrapping.
 6. Available Products. Subject to compliance with requirements, preformed foam sealants that may be incorporated in the work include, but are not limited to, the following:
 - a. Emseal, Emseal Corp.
 - b. Emseal Greyflex, Emseal Corp.
 - c. Wil-Seal 150, Wil-Seal Construction Foams Div., Illbruck.
 - d. Wil-Seal 250, Wil-Seal Construction Foams Div., Illbruck.

2.7 JOINT SEALANT BACKING

- A. **General.** Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. **Plastic Foam Joint Fillers.** Preformed, compressible, resilient, nonstaining, nonwaxing, nonextruding strips of flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
1. Open cell polyurethane foam.
 2. Closed cell polyethylene foam, nonabsorbent to liquid water and gas, nonoutgassing in unruptured state.
 3. Proprietary, reticulated, closed cell polymeric foam, nonoutgassing, with a density of 2.5 pcf and tensile strength of 35 pounds per square inch

(psi) per ASTM D 1623, and with water absorption less than 0.02 gms/cc per ASTM C 1083.

4. Any material indicated above.

- C. **Elastomeric Tubing Joint Fillers.** Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, capable of remaining resilient at temperatures down to -26° F. (-32° C.). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.
- D. **Bond Breaker Tape.** Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.8 MISCELLANEOUS MATERIALS

- A. **Primer.** Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant substrate tests and field tests.
- B. **Cleaners for Nonporous Surfaces.** Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. **Masking Tape.** Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. **General.** Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. **Surface Cleaning of Joints.** Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning,

mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil free compressed air.

3. Remove laitance and form release agents from concrete.
4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

- B. **Joint Priming.** Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. **Masking Tape.** Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. **General.** Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B. **Sealant Installation Standard.** Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. **Acoustical Sealant Application Standard.** Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- D. **Installation of Sealant Backings.** Install sealant backings to comply with the following requirements:
1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - a. Do not leave gaps between ends of joint fillers.
 - b. Do not stretch, twist, puncture, or tear joint fillers.
 - c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
 2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.

- E. **Installation of Sealants.** Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.

- F. **Tooling of Nonsag Sealants.** Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
 - 1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
 - 2. Provide flush joint configuration, per Figure 5B in ASTM C 1193, where indicated.
 - a. Use masking tape to protect adjacent surfaces of recessed tooled joints.
 - 3. Provide recessed joint configuration, per Figure 5C in ASTM C 1193, of recess depth and at locations indicated.

- G. **Installation of Preformed Foam Sealants.** Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, and to comply with sealant manufacturer's directions for installation methods, materials, and tools that produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in conformance with sealant manufacturer's recommendations.

3.4 CLEANING

- A. **General.** Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. **General.** Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

3.6 DEMONSTRATION

- A. **General.** Prior to final acceptance, the Contractor shall demonstrate to representatives of the Engineer/Architect (and/or Owner) that the in-place joint sealants are equal to the quality and appearance of the accepted mock-ups.

END OF SECTION

SECTION 08 31 01

FLOOR DOORS

PART 1 – GENERAL

- 1.1 **RELATED DOCUMENTS.** Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to this section.
- 1.2 **DESCRIPTION OF WORK.** Provide the labor, tools, equipment, and materials necessary to furnish and install floor doors in accordance with the plans and the specifications.
- 1.3 **QUALITY ASSURANCE**
- A. **Single-Source Responsibility.** Obtain floor doors for entire project from a single manufacturer.
 - B. **Size Variations.** Obtain Engineer/Architect's acceptance of manufacturer's standard size units, which may vary slightly from sizes indicated.
 - C. **Coordination.** Furnish inserts and anchoring devices that must be built into other work for installation of floor doors. Coordinate delivery with other work to avoid delay.
- 1.4 **SUBMITTALS.** Submit the following packages in accordance with Division 1.
- A. **Submittal Package No. 1 – Product Data**
 - 1. Manufacturer's product data, test reports, and material certifications as required.
 - 2. Product data in form of manufacturer's technical data and installation instructions for each type of floor door assembly, including setting drawings, templates, instructions, and directions for installation of anchorage, devices.
 - 3. Complete schedule, including types, general locations, sizes, floor construction details, finishes, latching or locking provisions, and other data pertinent to installation.
- 1.5 **JOB CONDITIONS.** Obtain specific locations and sizes for required floor doors from trades requiring floor to concealed equipment, and indicate on submittal schedule.
- 1.6 **DELIVERY, STORAGE, AND HANDLING** (Not used)
- 1.7 **SPECIAL WARRANTY** (Not used)

PART 2 – PRODUCTS

2.1 **MANUFACTURERS.** Subject with compliance with these specifications, floor doors shall be manufactured by:

- A. Bilco.
- B. Halliday.
- C. U.S.F. Fabrication
- D. Or equal.

2.2 MATERIALS AND FABRICATION

A. All Floor Doors.

1. Furnish each assembly manufactured as an integral unit, complete with all parts, and ready for installation.
2. Locks.
 - a. Where shown or scheduled, provide one-cylinder lock per door.
 - b. Furnish two keys per lock.
 - c. Key all locks alike unless otherwise noted.
3. Where shown or scheduled, provide secondary safety grating or netting under the floor door rated for 300 psf live loads.
4. Where shown or scheduled, provide a gastight floor door.
5. Factory finish shall be mill finish. Bituminous coating shall be applied by the manufacturer to the exterior of the frame and all aluminum in contact with concrete or mortar.
6. Leaf shall be 1/4-inch aluminum diamond plate reinforced with aluminum stiffeners as required to prevent distortion of the leaf when in any position.
7. Able to withstand a live load of 300 pounds per square foot (lbs/sf).
8. Arrangement shall be either single leaf or double leaf hinged as shown.
9. Open to 90 degrees and lock automatically in that position.
10. Frames shall be 1/4-inch extruded aluminum.

B. Interior Floor Doors

1. Provide frames with strap anchors bolted to the exterior.
2. Cast steel hinges shall be bolted to the underside and pivot on torsion bars that counterbalance the door for easy operation.
3. Provide a vinyl grip handle to release the hold-open arm and close the cover with one hand. Handle shall be permanently attached, and when not in use, the handle shall set flush with the surface.

C. Exterior Doors

1. Provide channel frames with an anchor flange around the perimeter.
2. Equip doors with heavy forged brass hinges, stainless steel pins, spring operators for easy operation.
3. Provide a vinyl grip handle to release the hold open arm and close the cover with one hand.
4. Provide a snap lock with removable handle.
5. Provide a 1-1/2-inch drainage coupling in the door frame.
6. Pipe drainage to outlet with 1-1/2-inch polyvinyl chloride (PVC) pipe to drain.
7. Hardware shall be stainless steel.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. **Comply with manufacturer's instructions** for installation of floor doors.
- B. **Doors shall be modified** by the manufacturer as required when necessary to suit the installation shown.
- C. **Coordinate installation** with work of other trades.
- D. **Set frames accurately in position** and securely attach to supports with face plate flush and level in relation to adjacent finish surfaces.
- E. **Install doors** to open in the direction shown.
- F. **Touch up the bituminous coating** if damaged.

3.2 ATTACHMENTS

- A. Floor Door Schedule.
 - 1. Not Used.

END OF SECTION

SECTION 08 36 13

SECTIONAL OVERHEAD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **General.** Provide the labor, tools, equipment, and materials necessary to furnish and install the sectional overhead doors in accordance with the plans and as specified herein.
- B. **This section includes sectional overhead doors**, as follows:
 - 1. Steel frame and steel panels.
 - 2. Manually operated doors.

1.3 QUALITY ASSURANCE

- A. **Codes and Standards.** Perform all work to furnish and install the sectional overhead doors in compliance with applicable requirements of governing agencies having jurisdiction and in accordance with these plans and as specified herein.
- B. **Manufacturer Qualifications.** Provide each sectional overhead door as a complete unit produced by a single manufacturer, including frames, sections, brackets, guides, tracks, counterbalance mechanisms, hardware, operators, and installation accessories.
- C. **Inserts and Anchorages.** Furnish inserts and anchoring devices that must be set in concrete or built into masonry for unit installation. Provide setting drawings, templates, and directions for installation of anchorage devices. Coordinate delivery with other work to avoid delay.
- D. **Miscellaneous.** See concrete and masonry sections for instruction on installing inserts and anchorage devices.
- E. **Wind Loading.** Design and reinforce sectional overhead doors to withstand a 20-pound-per-square-foot (psf) wind loading pressure.

1.4 SUBMITTALS

- A. **Transmittals.** Furnish manufacturer's product data, test reports, and material certifications as required.

- B. **Submit the following** according to Conditions of the Contract and Division 1 specification sections.
1. Product data, roughing-in diagrams, and installation instructions for each type and size of overhead door. Include manufacturer's operating instructions and maintenance data.

1.5 JOB CONDITIONS

Not used.

1.6 DELIVERY, STORAGE, AND HANDLING

Not used.

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. **Manufacturer.** Subject to compliance with requirements, provide products by one of the following:
1. Clopay Overhead Door Co.
 2. Raynor Garage Door Co.
 3. Wayne/Dalton Corp.
 4. Overhead Door Corp.

2.2 STEEL SECTIONS

- A. **Door Sections.** Construct door sections from galvanized, structural quality carbon steel sheets complying with American Society for Testing and Materials (ASTM) A 446, Grade A, or ASTM A 526, with a minimum yield strength of 33,000 pounds per square inch (psi), and a minimum G60 zinc coating complying with ASTM A 525.
1. Steel Sheet Thickness. 0.015 inch.
 2. Exterior Section Face. Ribbed or fluted.
- B. **Fabricate sections from a single sheet** to provide units not more than 24 inches high, and nominally 2 inches deep. Roll horizontal meeting edges to a continuous shiplap, rabbeted, or keyed weather seal, with a reinforcing flange return.
- C. **Framing.** Enclose open section with 16 gauge galvanized steel channel, end stiles welded in place. Provide intermediate stiles, cut to door section profile, spaced at not more than 48 inches on center (o.c.) and welded in place.
- D. **Reinforcement.** Reinforce bottom section with a continuous channel or angle conforming to bottom section profile.

1. Reinforce sections with continuous horizontal and diagonal reinforcing, as required by door width and design wind loading. Provide galvanized steel bars, struts, trusses or strip steel, formed to depth, and bolted or welded in place.
- E. **Insulation.** Insulate inner core of steel sections with manufacturer's standard glass fiber, polystyrene, or polyurethane foam-type insulation.
1. Enclose insulation with manufacturer's standard steel sheet secured to door panel.
- F. **Finish door sections** as follows:
1. Apply manufacturer's standard prime and finish coats, applied to interior and exterior door faces.

2.3 WOOD SECTIONS

Not Used.

2.4 ALUMINUM SECTIONS

Not Used.

2.5 FIBERGLASS TRANSLUCENT SECTIONS

Not Used.

2.6 TRACKS, SUPPORTS, AND ACCESSORIES

- A. **Tracks.** Provide manufacturer's standard, galvanized steel track system, sized for door size and weight, and designed for clearances shown. Provide complete track assembly including brackets, bracing and reinforcing for rigid support of ball bearing roller guides for required door type and size. Slot vertical sections of track at 2 inches o.c. for door drop safety device. Slope tracks at proper angle from vertical, or otherwise design to ensure tight closure at jambs when door unit is closed. Weld or bolt to track supports.
- B. **Track Reinforcement and Supports.** Provide galvanized steel track reinforcement and support members. Secure, reinforce and support tracks as required for size and weight of door to provide strength and rigidity without sag, sway, and vibration during opening and closing of doors.
- C. **Support and attach tracks** to opening jambs with continuous angle welded to tracks and attached to wall. Support horizontal (ceiling tracks) with continuous angle welded to track and supported by laterally braced attachments to overhead structural members at curve and end of tracks.

- D. **Weather Seals.** Provide continuous rubber, neoprene, or flexible vinyl adjustable weather-strip gasket at tops and compressible astragal on bottoms of each overhead door.

2.7 HARDWARE

- A. **General.** Provide heavy-duty, rust-resistant hardware, with galvanized or cadmium-plated or stainless steel fasteners, to suit type of door.
- B. **Hinges.** Provide heavy steel hinges at each end stile and at each intermediate stile, per manufacturer's recommendations for size of door. Attach hinges to door sections through stiles and rails with bolts and lock nuts or lock washers and nuts. Use rivets or self-tapping fasteners where access to nuts is not possible. Provide double-end hinges, where required, for doors exceeding 16 feet in width, unless otherwise recommended by door manufacturer.
- C. **Rollers.** Provide heavy-duty rollers, with steel ball bearings in case hardened steel races, mounted with varying projections to suit slope of track. Extend roller shaft through both hinges where double hinges are required. Provide roller tires to suit size of track (3-inch diameter for 3-inch track; 2-inch diameter for 2-inch track) and as follows:
 - 1. Neoprene or bronze tires for hazardous atmospheres.
- D. **Pull Handles, Locks and Latches.** For manually operated doors, furnish lifting handles, locks, and locking device as follows:
 - 1. Lifting Handles. Galvanized steel.
 - 2. Locking Bars. Single side, operable from inside only.
- E. **Fabricate locking device assembly** with mortise lock, spring-loaded dead bolt, chromium-plated operating handle, cam plate, and adjustable locking bar to engage through slots in tracks.

2.8 COUNTERBALANCING MECHANISM

- A. **Torsion Spring.** Operation by torsion spring counterbalance mechanism, consisting of adjustable tension, tempered steel torsion springs mounted on a cross header tube or steel shaft. Connect to door with galvanized aircraft type lift cables. Provide springs calibrated for 10,000 cycles minimum.
- B. **Provide cast aluminum or gray iron casting** cable drums, grooved to receive cable. Mount counterbalance mechanism with manufacturer's standard ball bearing brackets at each end of shaft. Provide one additional midpoint bracket for shafts up to 16 feet long and two additional brackets at one third points to support shafts over 16 feet long, unless closer spacing recommended by door manufacturer.
- C. **Include a spring loaded, steel or bronze cam** mounted to bottom door roller assembly on each side, designed to automatically stop door if either cable breaks.
- D. **Provide a spring bumper** at each horizontal track to cushion door at end of opening operation.

2.9 MANUAL DOOR OPERATION

- A. **Push-Up.** Provide lift handles and pull rope for raising and lowering doors, operating with not more than 25-pound lift or pull.

2.10 ELECTRIC DOOR OPERATORS

Note Used.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. **General.** Install door, track, and operating equipment complete with necessary hardware, jamb and head mold stops, anchors, inserts, hangers, and equipment supports according to shop drawings, manufacturer's instructions, and as specified.
- B. **Fasten vertical track assembly** to framing at not less than 24 inches o.c. Hang horizontal track from structural overhead framing with angle or channel hangers, welded and bolt fastened in place. Provide sway bracing, diagonal bracing, and reinforcing as required for rigid installation of track and door operating equipment.
- C. **After completing installation,** including work by other trades, lubricate, test, and adjust doors to operate easily, free from warp, twist, or distortion and fitting weathertight for entire perimeter.

END OF SECTION

SECTION 09 90 00

PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENT

- A. **General.** Drawings and general provisions of Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** This section includes surface preparation, painting, and finishing of exposed interior and exterior surfaces. Surface preparation, priming, and finish coats specified in this section are in addition to shop priming and surface treatment specified under other sections.
- B. **Definitions.** "Paint" includes coating systems materials, primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate, or finish coats.

1.3 QUALITY ASSURANCE

- A. **Standards.** Ensure that material and workmanship are in accordance with the following standards as referenced herein:
1. SSPC – The Society for Protective Coatings.
 2. Corps of Engineers.
 3. NSF – NSF International.
 4. ICRI – International Concrete Repair Institute.
 5. ASTM – American Society for Testing and Materials.
 6. NACE – National Association of Corrosion Engineering.
 7. NAPF – National Association of Pipe Fabricators, Inc.
- B. **Single Source Responsibility.** Provide primers, coats, and finish coats from the same manufacturer.
- C. **Compatibility of Work**
1. Review other sections in which primers are provided to ensure compatibility of the total systems for various substrates.
 2. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
 3. Notify the Engineer/Architect of problems anticipated using the materials specified.

SUBMITTALS

D. General

1. Submit all submittals in accordance with the Division 1 Submittal Requirements and this specification section.

E. Submittal Package No. 1 – Product Data

1. Product Data.
 - a. Submit manufacturer's technical information, label analysis, and application instructions for each material proposed for use.
 - b. List each material and cross-reference the specific coating, finish system, and application.
 - c. Identify each material by the manufacturer's catalog number and general classification.

F. Submittal Package No. 2 – Color Charts

1. Samples. Submit manufacturer's color charts for Owner's use.

1.4 JOB CONDITIONS

A. Environmental Conditions

1. Climatic.
 - a. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 40 degrees Fahrenheit (° F.) and 90° F.
 - b. Apply solvent thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45° F. and 95° F.
 - c. Do not apply paint:
 - 1) In precipitation or fog of any kind.
 - 2) When the relative humidity exceeds 85 percent.
 - 3) At surface temperatures less than 5° F. above the dew point.
 - 4) To damp or wet surfaces.
 - d. When approved, continue painting during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

2. Ventilation.
 - a. Be responsible for maintaining adequate ventilation, temperature, and humidity control in all areas where paint is being applied, drying, or curing.
 - 1) "Adequate" ventilation, temperature, and humidity levels are considered to be those required by regulatory agencies and guidelines, the paint manufacturer's product application data, the requirements of this section, and the Owner's Representative.

B. Warning Signs

1. Provide and display prominent warning signs indicating "WARNING - PAINTING AND ABRASIVE BLASTING WORK UNDERWAY" throughout the job site wherever surface preparation or painting operations are being performed.
 - a. These signs shall be no less than 3' x 3' in size, and placed at clearly visible locations near all points of access by person or vehicle to the work area(s).

- C. Lead Bearing Paint.** Contractor is responsible for providing means to remove paint from steel frames in a manner that complies with the local, state and federal rules and regulations regarding protecting workers and surrounding areas from dust migration while preparing areas for painting in accordance with other sections of this Section 09900 Painting.

C. Priming and Painting Fireproofing of Exposed Structural Steel.

1. Painting New Exposed Structural Steel to be Covered by Fireproofing: Contractor is responsible for coordination of shop/prime coat of structural steel that will be covered by fireproofing after fabrication and/or erection. A prime coat of paint shall be provided in the shop that is approved by the Fireproofing Manufacturer. Fireproofing shall not be coated until all field installation by trades is complete. Any fireproofing shall be repaired prior to application of paint to protect fireproofing. The primer and top coats shall be compatible with the fireproofing material. All fireproofing will be painted in accordance with the schedule provided for new exposed structural steel provided under this contract that is designated to have fireproofing.
2. Painting Existing Exposed Structural Steel with Fireproofing. All existing exposed structural steel that has previously been covered with fireproofing, shall be painted to match new work per paint schedule. Contractor shall repair any existing fireproofing that has been disturbed prior to application of new paint to match new work. All paint coatings shall be approved by fireproofing manufacturer for compatibility.
3. Repairs: Prior to painting exposed structural steel that has been fireproofed, the Contractor will repair any fireproofing that is disturbed

or damaged by demolition work, or during installation of new work that disturbs or damages fireproofing on existing structural steel, shall be repaired in accordance with manufacturer recommendations for surface preparation and application of fireproofing to those in areas being repaired. The repaired areas will be primed with suitable primer paint, and a new finish paint applied in accordance with the paint schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

A. **Delivery.** Deliver materials to the job site in the manufacturer's original, unopened containers bearing a label from the manufacturer that includes the following:

1. Product name or title of material.
2. Product description (generic classification or binder type).
3. Federal Specification number, if applicable.
4. Manufacturer's stock number and date of manufacture.
5. Contents by volume, for pigment and vehicle constituents.
6. Thinning and application instructions.
7. Color name and number.
8. Manufacturer's name.

B. **Storage**

1. Store materials not in use in tightly covered containers in a well ventilated area at a minimum ambient temperature of 45° F.
2. Keep storage area in a clean condition, free of foreign materials and residue.
3. Store clean rags in a metal container with a tight-fitting cover.
4. Remove oily rags and waste daily.

C. **Handling.** Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.6 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.1 **MANUFACTURERS.** Use products of the manufacturers listed in the painting schedule. No "Or Equals" will be considered for this project. Submit any potential substitutes according to Section 00 70 00, "General Conditions."

2.2 **PIPE BANDING TAPE, LABELING, AND DIRECTIONAL ARROWS**

- A. **Minimum 2 inches wide**, self-sticking.
- B. **Meets ASTM B 946.**
- C. **5-mil minimum** thickness.
- D. **Label text heights** shall be sized as follows:

Under 3/4"	Arrows only
3/4" to 1-1/4"	1/2"
1-1/2" to 2"	3/4"
2-1/2" to 6"	1-1/4"
8" to 10"	2-1/2"
10" and over	3-1/2"

E. **Approved Manufacturers**

- 1. W. H. Brady Company.
 - 2. Seton Identification Products.
 - 3. Or equal.
- 2.3 **THINNERS.** Use only the recommended products of the manufacturer furnishing the paint.
- 2.4 **COLORS.** All colors not specified will be selected by the Owner. Where multiple coats are specified, shade-tint each coat of paint for visual inspection of the number of coats applied.
- 2.5 **POTABLE WATER CONTACT.** Coatings in contact with potable water shall meet NSF Standard 61 and shall be listed by NSF.

PART 3 - EXECUTION

3.1 **EXAMINATION**

A. **Compliance**

- 1. Examine substrates and conditions for compliance with paint application requirements.
- 2. Correct unsatisfactory conditions before painting.
- 3. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.
- 4. If any surface to be finished cannot be put in proper condition, notify the Engineer/Architect immediately in writing or assume full responsibility for failure to do so and correct any unsatisfactory work.

3.2 PREPARATION

A. General Procedures

1. Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items in place that are not to be painted, or protect them before surface preparation and painting.
2. Remove these items if necessary for complete painting of the items and adjacent surfaces.
3. Following completion of painting operations in each space or area, reinstall items by workers skilled in the trades involved.
4. All surfaces must be clean, dry, and free of oil, grease, chalk, and other containments.
5. Schedule cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet paint.

B. Surface Preparation. Clean and prepare surfaces to be painted in accordance with the manufacturer's instructions for each particular substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime.
2. Cementitious Materials. Prepare concrete, concrete masonry block, cement plaster, and mineral fiber reinforced cement panel surfaces to be painted.
 - a. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents.
 - b. Roughen as required to remove glaze.
 - c. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 - d. Use abrasive blast cleaning methods according to SSPC-SP13/NACE 6, ICRI CSP 2-3 to prepare concrete unless an alternate method is approved.
 - e. Prepare all concrete surfaces designated chemical resistant per ICRI CSP 3-5 minimum with all bugholes opened and filled with an epoxy surfacer (Paint Code F in the Schedule).
 - f. Determine alkalinity and moisture content of surfaces by performing appropriate tests.
 - 1) If surfaces are sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application.
 - 2) Do not paint surfaces where moisture content exceeds the manufacturer's recommendations.

3. Wood.
 - a. Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required.
 - b. Sand surfaces smooth which are exposed to view and remove dust when finished.
 - c. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer before application of primer.
 - d. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.

4. Ferrous Metals. Clean nongalvanized ferrous metal surfaces; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC-SP1/SP2/SP3.
 - a. Blast steel surfaces that will be submerged in accordance with requirements of SSPC Specification SSPC-SP 10, near white blast cleaning. Maintain a minimum 2-mil profile.
 - b. Abrasive-blast-clean nonsubmerged steel per SSPC-SP 6, Commercial Blast Cleaning creating a minimum 1.5-mil profile.
 - c. Brush off blast cleaned (SSPC-SP 7, Brush-Off Blast Cleaning) epoxy shop-primed surfaces that will be submerged and have not been painted for 60 days or longer before application of the intermediate and finish coats.
 - d. Blast ductile iron surfaces in accordance with requirements of NAPF 500 Abrasive Blast Cleaning.
 - e. Touch up bare areas and prime coats that have been damaged. Surface preparation shall be the same as the original surface preparation. Touch up with the same primer as the shop coat.
 - f. Prime all surfaces blast-cleaned on the same day or before rusting or soiling occurs.

5. Plastic. Clean surface and sand uniformly to resemble 80-100 grit sandpaper.

6. Existing Epoxy Finishes. Thoroughly and uniformly sand or otherwise abrade prior to recoating.

C. **Materials Preparation.** Carefully mix and prepare paint materials in accordance with manufacturer's directions.

1. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.
2. Stir material before application to produce a mixture of uniform density; stir as required during application.
3. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
4. Use only thinners approved by the paint manufacturer, and only within recommended limits.

3.3 APPLICATION

A. Requirements

1. Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 - a. Paint colors, surface treatments, and finishes are indicated in Part 4 of this section.
 - b. Provide finish coats that are compatible with primers used.
 - c. Apply additional coats when undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
 - d. Grind all 90-degree angles of carbon steel and apply a stripe coat of the specified primer.

B. Special Techniques/Requirements

1. Do not permit spraying unless approved in writing.
2. Ensure that the application, drying time between coats, and mixing are in accordance with the recommendations of the manufacturer.
3. Protect all areas from damage by equipment, materials, splatterings, drippings, and overspray. Take particular care to prevent staining of concrete. Immediately remove all splattering, dripping, and overspray. Paint or repaint any area discolored or stained as directed.
4. Prior to installation, finish-paint all surfaces inaccessible after installation.

3.4 MARKING

- A. **Color Coding.** Paint and mark according to function all exposed piping as specified in Part 4 of this section.
- B. **Banding.** Band all exposed piping as specified in Part 4 of this section. Space banding as directed, but not greater than 10 feet apart with a minimum of one group of bands between fittings.
- C. **Flow Arrows.** Provide arrows indicating flow direction on all exposed piping.
- D. **Labeling.** Label all exposed piping with the function of the pipe. Apply labeling on any single run of pipe before any tees or elbows, but not greater than 20 feet on center.

3.5 FIELD QUALITY CONTROL

- A. **The Owner reserves the right** to invoke the following test procedure at any time and as often as desired during the period when paint is being applied.
 - 1. The Owner will engage the services of an independent testing agency to sample the paint material being used. Samples of material delivered to the project will be taken, identified, sealed, and certified in the presence of the Contractor.
 - 2. If test results show material being used does not comply with the published manufacturer's specifications for that paint system:
 - a. Stop painting.
 - b. Remove noncomplying paint.
 - c. Pay for testing.
 - d. Repaint surfaces coated with rejected paint.
 - e. Remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are incompatible.
- B. **The Owner reserves the right** to check the minimum dry mil thickness per coat (MDMTPC) at any time following application. Repaint areas not meeting minimum requirements.
- C. **Provide a 10' x 10' mock-up** of each specified system, including surface preparation and finish color. The mock-up may remain as part of the completed project. Proceed with the rest of the paint application when authorized to proceed in writing.

3.6 PROTECTION

- A. **Cover.** Protect work of other trades, whether to be painted or not, against damage by painting. Correct damage in an acceptable manner by cleaning, repairing or replacing, and repainting.
- B. **Signs**
 - 1. Provide "wet paint" signs to protect newly painted finishes.
 - 2. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.
 - 3. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.
 - 4. Remove all "Wet Paint" signs and other warning signs utilized during installation and curing.

3.7 DEMONSTRATION

- A. **Visual.** The Contractor, Owner, and Engineer/Architect will visually review the painting for completion, colors, finish, and uniformity before acceptance by Owner.

PART 4 - SCHEDULE

4.1 GENERAL

- A. **Dry Film Thickness Per Coat.** DFT is the acronym for this term in the following schedules. Do not exceed the manufacturer's recommended maximum dry film thickness per coat.
- B. **New Work.** Paint all new surfaces according to paragraph 4.2.
- C. **Existing Areas**
 - 1. **Compatibility Test.** Before painting, patch test all areas for compatibility of new paint with existing and notify the Engineer/Architect of any incompatibility.
 - 2. **Adhesion Test.** Before painting, perform the tests per ASTM D 3359, Methods A and/or B, followed by a report detailing the system tested, their results, and any recommended changes to the specified system.
 - 3. **Disturbed Areas.**
 - a. Paint all surfaces of existing areas disturbed due to tie-ins, closing of openings, cutting new openings, rerouting of pipe, relocating or removal of equipment, and other related work as specified herein.
 - b. Color match existing surface and paint to lap existing by not less than 3 inches.
 - 4. **Undisturbed Areas.** Paint the following undisturbed surfaces in their entirety.
 - a. All previously painted surfaces in the plant shall be prepared and painted per this specification. Previously painted surfaces include but are not limited to walls, ceilings, floors, door frames, piping, valves, valves operators, operators, conduit, utility boxes, pumps, equipment, structural steel, miscellaneous metals, and steel handrail.
 - b. Appendix B of the specifications includes a summary report of the cursory paint sampling analysis which indicates no lead paint was detected. The intent is to prep and paint all door frames without removal of the existing coating. Contractor shall abide by all local, state and federal requirements for handling and surface preparation of lead containing existing coatings.

D. **Coding and Banding.** When exposed, color code and band the following piping, fittings, and valves with the specified colors:

Material	Tnemec	PPG	Carboline	Sherwin Williams	International	ICI/Devoe
Water Raw Settled Filtered Softened Finished or Potable Backwash Supply Nonpotable	Spring Water Aqua Sky Delft Blue Clear Sky Safety Blue Purple Haze Safety Purple	Fiberoptics Water Garden Cavern Ice Cooling Tower Safety Blue Cyprus Blue Safety Purple	Blue Ice Skyward Open Sky Atomic Blue Safety Blue National Blue Safety Purple	Generator Green Alloy Aqua Conductor Blue Robotic Blue Safety Blue Camshaft Plumb	Light Blue Mint Green Sky Blue Mid-Ocean Blue Safety Blue Blue Safety Purple	Seafoam Breeze Cascading Water Car Blue Light Blue Safety Blue National Blue Safety Purple
Wastewater Raw Primary Secondary Filtered Effluent Backwash Waste/ Supernatant Filter to Waste/Drain	Deep Space Gray Light Gray Slate Gray White Aluminum Black	Dark Gray Light Gray ASA No. 70 Mountain Mist Porcelain White Conveyor Gray Black Gold	Machine Gray Gull Gray Light Gray Sterling Gray Safety White Granite Gray Black	Graphite ANSI #70 Gray Slate Gray Galvano Pure White Pallet Tan Black	Aluminum Gray Light Gray Gray Platinum Gray Blued White Steel Gray Black	Machine Gray Haze Gray Light Gray Mist Gray White on White Swordplay Black
Sludge Primary WAS RAS Digested Thickened	Clay Muley Amber Canyon Tiki Wood Weathered Bark	Weathered Marble Desert Brown Beechnut Tantone Telegraph	Basket Weave Blush Alpaca Dunes Tan Falcon Brown	Olivine Bolt Brown Bolt Brown Modular Tan Umbra	Dark Ivory Beige Medium Brown Cream Tan Brown Medium Brown Bark	Water Chestnut Clay Pot Tuscan Tan Sand Motif Warm Brown
Flammable/Explosive Natural and Propane Gas Liquid Fuel Oil/Diesel Methane/Digester Gas Odor Control Foul Air	Safety Red Chilean Red Safety Orange International Orange	Safety Red Caution Red Safety Orange Caution Orange	Safety Red Tile Red Safety Orange Coppers Smith	Safety Red Deck Red Safety Orange Mason Brick	Safety Red Red Safety Orange International Orange	Safety Red Oxide Red Safety Orange Kessy's Bark
Air Low Pressure (≤ 90 psi) High Pressure (> 90 psi)	Hunter Green Safety Green	Caution Green Safety Green	Vernal Green Safety Green	Cedar Green Rain Forest	Signal Green Safety Green	Medium Green Safety Green

Material		All Manufacturers
NEORS D PROCESS PIPING COLOR CODES		
Class	Substance ID	Color Code
Water	Potable Hot Water Fire Water NPW Water Seal Water Steam	Blue Blue with Red Bands Red Light Blue with Orange Bands Blue with Orange Bands White
Drains	Sump Drains Storm Drains Floor Drains	Light Grey Grey with White Bands Light Grey
Gases and Fuels	Air Natural Gas Fuel Oil Vents Plumbing	Green Orange Orange with Brown Bands Aluminum Aluminum
Process Chemicals	Acid (i.e. Sulfuric Acid, etc.) Chlorine Solution Chlorine Gas Lime Slurry Potassium Permanganate	Orange with Black Bands Safety Yellow with Blue Bands Safety Yellow with No Bands Orange with White Bands Violet
Process Liquids	Sanitary Waste Scum and Grease Centrate Supernatant Sludges Grit Clarifier Drains TCTO & GTO	Dark Grey Brown with Black Bands Cream Black Dark Brown Black with Grey Bands Brown with White Bands Black
Electrical Conduit		Match ceilings and walls. Label all Conduits No. per Stds.

4.2 PAINT SCHEDULE

Surface Substrate	Surface Location	Immersed or Below Grade	Exterior Only	Interior Only	Exterior / Interior	Required Coats	DFT	Paint Codes
Concrete Block or Masonry <ul style="list-style-type: none"> • Paint Interior of all new Exposed Concrete Block • Paint all other Masonry Where Noted in the Plans or Specifications 	Walls			X		1 Primer/Block Filler 1 Intermediate 1 Finish	12 4 4	A B B
	Walls		X			1 Primer/Block Filler 1 Intermediate 1 Finish	12 6 6	A M M
	<i>Walls, Existing painted</i>					<i>1 Primer 1 Intermediate 1 Finish</i>	<i>4 4 4</i>	<i>B B B</i>
Precast Concrete and Cast-in-Place Concrete <ul style="list-style-type: none"> • Paint the interior of all exposed precast concrete ceilings. • Paint all other Concrete Where Noted in the Plans or Specifications. 	Walls and Ceilings			X		1 Primer/ Surfacer 1 Finish	12 4	F B
	Walls and Ceilings		X			1 Primer/ Surfacer 1 Intermediate 1 Finish	12 6 6	F M M
	Walls, Ceilings, and Floors, In Contact with Potable Water	X			X	1 Primer/Surfacer 1 Intermediate 1 Finish	- 4 4	F C C
	Walls, Ceilings, and Floors, In Contact with Nonpotable Water or Sewage	X			X	1 Primer/Surfacer 1 Intermediate 1 Finish	- 10 10	F D D
	Walls and Floors, Chemical Resistant				X	1 Primer/ Surfacer 1 Intermediate 1 Finish	12 9 9	F H H
	Floors			X		1 Primer/ Surfacer 1 Intermediate 1 Finish	12 9 9	F E E

For paint codes see paragraph 4.3 at the end of this Section.

Surface Substrate	Surface Location	Immersed or Below Grade	Exterior Only	Interior Only	Exterior / Interior	Required Coats	DFT	Paint Codes
<p>Ferrous Metal Products</p> <ul style="list-style-type: none"> • Paint all Miscellaneous Fabrications • Paint all Ferrous Metal Products including Piping, Valves, Fittings, Equipment, and Miscellaneous Metals Installed during Project. • Paint existing Ferrous Metal Products Where Noted in the Plans or Specifications. • Metal Siding, Fascia, and Coping shall be prefinished by the manufacturer. • Paint all exposed galvanized conduit and pipe in painted finished areas. • Paint all damaged and disturbed areas of any galvanized products such as threading or field-welds. • Do not paint stainless steel, aluminum, galvanized steel or similar corrosion resistant materials unless noted otherwise in the drawings or the specifications. 	Submerged, In Contact with Potable Water	X			X	1 Shop/Primer 1 Touch Up 1 Intermediate 1 Finish	4 4 4 4	C C C C
	Submerged, In Contact with Nonpotable Water or Sewage	X			X	1 Shop/Primer 1 Finish	10 10	D D
	High Temperature(<450 °F)				X	1 Shop/Primer 1 Intermediate 1 Finish	1.6 1 1	J L L
	Very High Temperature (450 °F to 750 °F)				X	1 Shop/Primer 1 Intermediate 1 Finish	1.6 1 1	K K K
	Galvanized Product Touch-ups				X	1 Primer 1 Finish	2 2	P P
	Exterior			X		1 Shop/Primer 1 Touch Up 1 Intermediate 1 Finish	4 4 4 4	B B B G
	Interior				X	1 Shop/Primer 1 Touch Up 1 Intermediate 1 Finish	4 4 4 4	B B B B

For paint code details, see paragraph 4.3 at the end of this Section.

Surface Substrate	Surface Location	Immersed or Below Grade	Exterior Only	Interior Only	Exterior / Interior	Required Coats	DFT	Paint Codes
Structural Steel <ul style="list-style-type: none"> Paint interior Exposed Structural Steel in <i>Screen Building and Screenings Rooms</i> with primer that is approved by fireproofing manufacturer. Paint all exposed structural steel after installation of fireproofing is complete. Paint all Structural Steel concealed in walls with shop primer and touch-up after field installation. Paint all existing exposed structural steel to match new work. Paint all structural steel that support equipment, platforms, and walkways, but do not provide support of the building. 	Exposed Steel in Screen Buildings that will be fireproofed			X		1 Primer approved by Fireproofing Mfgr. <i>Fireproofing by others</i>	4	Q
	Exposed Structural Steel with Fireproofing (Existing and New Steel)			X		1 Primer 1 Touch Up 1 Intermediate 1 Finish	4 4 4 4	B B B G
	Concealed Structural Steel embedded in Walls			X		1 Shop/Primer 1 Touch Up	4 4	B B
	Existing structural steel that is embedded in walls.			X		1 Touch Up	4	B
	Exposed Structural Steel Supports for equipment, platforms, walkways except for galvanized or aluminum or non-ferrous fabrications.					X	1 Primer 1 Touch Up 1 Intermediate 1 Finish	4 4 4 4

Plastic Products <ul style="list-style-type: none"> Paint all exposed interior Plastic Pipe, Fittings, and Valves installed in this project or where noted in the plans or specifications. 		X			1 Primer 1 Intermediate 1 Finish	4 4 4	B B G
			X		1 Primer 1 Finish	2 3	B B
Wood Products <ul style="list-style-type: none"> Paint all exposed Wood installed in this project or where noted in the plans and specifications except for Prefinished, Redwood, or Pressure-Treated Products. 				X	1 Primer 1 Intermediate 1 Finish	2 2 2	N O O
				X	1 Primer 1 Finish	2 4	N O
				X	1 Primer 1 Intermediate 1 Finish	2 4 4	N O O
Foam Piping Insulation <ul style="list-style-type: none"> Paint all Foam Piping Insulation Where Noted in the Plans or Specifications. 				X	1 Primer 1 Finish	2 4	N O
Drywall and Plaster <ul style="list-style-type: none"> Paint all exposed Drywall and Plaster installed in this project or where noted in the plans or specifications. 			X		1 Primer 1 Intermediate 1 Finish	2 4 4	N O O
Pipe Coverings and Pipe Drains	Match walls and ceilings						

For paint code details, see paragraph 4.3 at the end of this Section.

4.3 MANUFACTURERS AND PAINT CODES

Generic Name	Code	Tnemec	PPG	Carboline	ICI/Devoe	Sherwin Williams	International
Cementitious Acrylic or Polyamide Epoxy Block Filler	A	Series 130-6602 Envirofill	Aquapon 97-685 Series	Sanitile 600	Bloxfill 4000 Block Filler	Cement Plex 875	Intercryl 320
Polyamide Epoxy	B	Series N69-H.B. Epoxoline II	Aquapon HB 97-130	Carboguard 893 SG	Devran 224 HS	Macropoxy 646 FC	Intergard 251
Polyamide Epoxy NSF 61 Approved	C	Series N140 Pota-Pox Plus	Aquapon 95-132	Carboguard 561	Bar-Rust 233H	Macropoxy 646 PW	Interseal 670HS
Coal Tar Epoxy/Ultra High Build Epoxy	D	Series 46H-413 Black HB Tneme-Tar	Coal Cat 97-650	Bitumastic 300M	Devtar 5A	Hi-Mil Sher Tar	Interzone 954
Self-Leveling/ Polyamide Epoxy	E	Series 281 Tneme-Glaze	Megaseal SL 99-6680	Sanitile 945	DevFloor 525 with DevFloor 571	Cor-Cote HP	Intergard 345
Filler and Surfacer	F	Series 218 MortarClad	Megaseal CF 99-6672 or -6675	Sanitile 600 TG	DevFloor 574 / Bloxfill 4000	Steel Seam FT 910 or General Polymers 3513	Ceilmote 610 / Corocrete SF
Polyurethane	G	Series 1074 H.B. Endura-Shield II	Pitthane Ultra 95-812	Carbothane 134 HG	Devthane 379	Acrolon 218HS	Interthane 870
Novolac Epoxy	H	Series 282 Tneme-Glaze	Megaseal SC/HSN	Semstone 145	Devran 124	ExpressCote HCR	Ceilmote 2000 w/ Ceilmote 680
Not Used	I						
High Temperature Primer	J	Series 90E-92 Tneme-Zinc	Silicone-Acrylic Red	Carbozinc 11	HT-8	Zinc Clad II	Interzinc 22
High Temperature Silicone (Resists at least 450 °F)	K	Series 39	Speedhide 6-230	Thermaline 4900 R	HT-8	Kem Hi-Temp Heat-Flex 450	Intertherm 875

Generic Name	Code	Tnemec	PPG	Carboline	ICI/Devoe	Sherwin Williams	International
Very High Temperature Silicone (resists at least 1000 °F and requires a bake cure)	L	Series 39	Speedhide 6-220	Thermaline 4700	HT-10 Aluminum	Hi-Temp 1000V	Intertherm 50 Aluminum
Elastomeric Acrylic	M	Series 156/157 Envirocrete	Permacrete 4-110	Flexxide Elastomer	#2200 Decra-Flex Elastomeric	Loxon XP	N/A
Acrylic Primer	N	Series 10-10-99W	Seal Grip 17-921	Carbocrylic 120	Devflex 4020	DTM Primer Finish	Intercryl 520
Acrylic	O	Series 6 Tneme-Cryl	Pitt Tech 90-474	Carbocrylic 3359	Devflex 4208	DTM Acrylic	Intercryl 530
Cold Galvanizing Compound	P	Minimum 95% Zinc. Approved Manufacturers: Rust-Oleum, ZRC, or Chesterton 752, or Sherwin Williams Cold Galvanizing Aerosol.					
Shop applied primer for Structural Steel that will receive fireproofing	Q	Provide special shop prime coat to fabricated structural steel after cleaning and fabrication that is approved by fireproofing manufacturer. Field touch up prior to installation of fireproofing. Solvent based fireproofing products must be compatible with primer. Contractor to apply minimum 4 mils of flat, low end epoxy primer per schedule, or other primer that is approved by fireproofing manufacturer.					

END OF SECTION

SECTION 09 96 35

CHEMICAL-RESISTANT COATING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** The Contractor shall provide the labor, tools, equipment, and materials necessary for surface preparation and to furnish and install the epoxy coating in accordance with the plans and as specified herein at the following locations:
 - 1. The interior surface of the chemical storage containment sumps shall be suitable for the intended chemical exposure to be encountered. Material must be capable to withstand a complete submergence for the following chemicals at ambient temperature without crazing, peeling, blistering, or loss of protection for the concrete substrate. Slight discoloration only is permissible. Submit test data to verify that product conforms to this criterion.
 - a. 38-42 percent sodium bisulfite (NaHSO₃)

1.3 QUALITY ASSURANCE

- A. **Codes and Regulatory Agencies.** Perform all work in compliance with all federal, state, and local codes and regulatory agencies.
- B. **Installer's Qualification.** The Installer of work of this section shall have 5 years minimum proven experience in this type of installation and shall have satisfactorily completed three jobs of similar size and type within the last 5 years.
- C. **Manufacturer's Material Certification.** The Manufacturer of materials in this Section shall have 5 years minimum proven experience of their materials in similar type applications.

1.4 SUBMITTALS

- A. **Product Data.** Submit copies of manufacturer's technical information, including label analysis and application instructions for each material proposed for use.
 - 1. Include surface preparation required for each base coat or prime coat product.
 - 2. Include complete job site mixing and preparation procedures, including

3. straining instructions.
 3. Include test data in compliance with Paragraph 1.3 A.
- B. **Shop Drawings.** Show areas to be coated, proposed protection procedure, repair data, termination and joints, method of application.
- C. **Certification.** Submit:
1. Installer's Certification of Compliance with Paragraph 1.3 B of this Section.
 2. Material Certification of Compliance with Paragraph 1.3 C and 1.7 A of this Section.

1.5 JOB CONDITIONS

- A. **Preinstallation Conference.** Hold a pre-installation conference with all parties concerned with the work, its application, protection, and guarantee.
- B. **Coordination.** Schedule and coordinate work with other trades to avoid delays, errors, and omissions.
- C. **Environmental Conditions.** Do not proceed with epoxy coating until the following conditions are met:
1. All work penetrating or built into the substrate is completed.
 2. A minimum of 30 days after concrete has been placed to permit curing of concrete.
 3. If substrate and ambient air temperature is less than 50 degrees Fahrenheit or 10 degrees Celsius.
 4. The Contractor shall be responsible for maintaining adequate ventilation, temperature, and humidity control in all areas where the epoxy coating is being applied, including application, drying, and curing periods.
 5. The Contractor shall provide and display prominent warning signs indicating that the epoxy coating work is being performed. The signs shall be no less than 3' x 3' in size and shall be placed at clearly visible locations near all points of access to the work area(s).

1.6 DELIVERY, STORAGE, AND HANDLING

- A. **Delivery.** Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
1. Product name or title of material.
 2. Product description (generic classification or binder type).
 3. Manufacturer's stock number and date of manufacture.
 4. Contents by volume, for pigment and vehicle constituents.
 5. Thinning instructions.
 6. Application instructions.

7. Color, name, and number.

- B. **Storage.** Materials not in use shall be stored in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 50° F. (10° C.). Keep storage area in a clean condition, free of foreign materials and residue. Store clean rags in a metal container with a tight fitting cover.
- C. **Handling.** Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.7 SPECIAL WARRANTY

A. None.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Epoxy Coating

1. Prime Coat. A high solids, pigmented epoxy primer and binder resin with good blush resistance and is low in viscosity to promote penetration of the concrete substrate and excellent wetting of mortar aggregate.
 - a. Properties.
 - 1) Mixing Ratio. 2:1; or as recommended by manufacturer.
 - 2) VOC (EPA Method 24): <50 g/L mixed: 0.41 lbs/gal
 - 3) Viscosity, mixed. 1500 to 3000 centipoise (cps).
 - 4) Adhesion. 300 pounds per square inch concrete failure
 - 5) Compressive Strength. 9,000 pounds per square inch
 - 6) Flammability. Self-extinguishing over concrete
 - 7) Flexural Strength. 6,000 pounds per square inch.
 - 8) Hardness, Shore D. 75/65 per ASTM D 2240 test method
 - 9) Tensile Strength. 3,000 pounds per square inch minimum per ASTM D 638
 - 10) Pot Life. Gallon Mass 25 to 30 minutes @ 73°F.
2. Finish Coat. A pigmented, high-build, high solids Novalac epoxy which resists vapor, splash, spillage, or immersion to certain aggressive acids, alkalis, and solvents. This epoxy shall bond aggressively to the properly prepared and primed substrates, protecting the substrate from damaging chemicals.
 - a. Properties.
 - 1) Mixing Ratio. 2:1; or as recommended by manufacturer.
 - 2) VOC (EPA Method 24): <50 g/L mixed: 0.41 lbs/gal

- 3) Viscosity, mixed. 1,000 centipoise (cps).
 - 4) Adhesion. 300 pounds per square inch concrete failure
 - 5) Abrasion Resistance. 100 mg loss per ASTM D4060 CS17 wheel, 1,000 cycles test method.
 - 6) Flammability. Self-extinguishing over concrete
 - 7) Hardness, Shore D. 80 per ASTM D 2240 test method
 - 8) Resistance to Elevated Temperatures. No slip or flow at required temperature of 158°F.
 - 9) Pot Life. Gallon Mass 40 minutes @ 73°F.
3. Spreading Rate.
 - a. Prime coat. 6-20 mils or 150-500 microns
 - b. Finish coat. 10-20 mils or 250-500 microns
 4. Color.
 - a. All surfaces shall be coated with alternating color layers.
 - b. Finish color shall be selected by Owner.
 5. Products/Manufacturers.
 - a. Primer Coat: General Polymers GP3579 STANDARD EPOXY PRIMER/ BINDER (PARTS A & B) by Sherwin Williams, or approved equal.
 - b. Finish Coat: General Polymers GP 3741 NOVO_FLO SOLVENT/ACID RESITATNT COATING (PARTS A & B)by Sherwin Williams, or approved equal.

B. Chemical-Resistant Coating

1. A high acid resistant, two- or three-component polymer-based 100 percent solids vinyl ester coating. The mixing ratio shall be as recommended by the manufacturer.

2. Minimum dry mil thickness per coat (MDMTPC).

MDMTPC

Prime Coat	15
Intermediate Coat	15
Finish Coat	15

3. Coloration. Coat all surfaces with alternating color layers. For example, the base coat could be cream, intermediate coat light, and top coat off-white.
4. Products/Manufacturers.
 - a. Plasite 4007, Carboline.
 - b. Series 120 Vinestra, Tenemec Company, Inc.
 - c. Series 8000 CoRezyn, Interplastic Corporation.

C. Miscellaneous Items.

1. Provide primers, fillers, glass granules, sealers, joint tapes, adhesives, and accessories as recommended by the manufacturer of the epoxy coating and chemical resistant coating for the application shown.
2. The drying schedule shall comply with manufacturer's recommendations.

D. Repair Parts.

2. Provide one 0.9 gallon kit for touch-up and repair.

PART 3 - EXECUTION

3.1 INSPECTION

- A. **Surface Examination.** Contractor shall examine the surface to receive the chemical resistant protective coating and the conditions under which the chemical resistant protective coating work is to be performed, and notify the Engineer/Architect in writing of any conditions detrimental to the proper and timely completion of the work and performance of the coating. Do not proceed with the chemical resistant protective coating work until unsatisfactory conditions have been corrected. Start of chemical resistant coating application will be construed as the applicator's acceptance of surfaces and conditions within a particular area.

3.2 PREPARATION OF SUBSTRATE

A. General

1. Surfaces shall be prepared in accordance with Manufacturer's recommendation. A vapor/moisture barrier shall be provided if recommended by the Manufacturer.
2. Surfaces shall be free of dirt, foreign material, and projections.
3. Fill voids, seal joints, and apply bond breakers as recommended by the Manufacturer.
4. Safety. Refer to MSDS sheet before use.
5. Prime the substrate as recommended by the Manufacturer.
6. Contractor will clean and remove all residues and:
 - a. Concrete surfaces should be shot blasted and surface shall be clean and dry. It shall be the Contractor's responsibility to remove materials used to prepare the surfaces for coating. Materials shall be removed off the site for proper disposal. Objects and surfaces not to be coated shall be protected.
 - b. Glazed tile shall be mechanically roughened per the manufacturer's recommendations and then prepped per 5.a above.
 - c. Mixing.
 - 1) Premix the individual components so as to redistribute any pigments that may have settled during storage. Mixing the chemical resistant coating shall be as recommended by the manufacturer.

3.3 APPLICATION

A. General

1. Do not allow liquid and mastic compounds to enter drains and pipes. Prevent spillage and migration onto other surfaces of the work.
2. Apply in accordance with manufacturer's recommendations.
3. Walls. Protective coating may be applied by brush or roller. No spray applications will be permitted.
 - a. Apply a uniform coating to the surfaces indicated. Apply second coat of protective coating after initial "set" of the first application but not longer than 48 hours.
 - b. Allow at least 7 days cure at between 70 to 75 degrees Fahrenheit. Lower temperatures will require longer cure times.
4. Floors, stair treads, and other varying surfaces.
 - a. Apply a uniform prime coat to the surfaces indicated and allow to dry to initial set.
 - b. The intermediate coat should be applied and immediately broadcast with glass granules into the coating at a rate of 100 percent saturation or approximately 0.2 to 0.3 pounds per square foot.
 - c. The finish coat of protective coating should be applied and broadcast with glass granules at a rate of 100 percent saturation or approximately 0.3 to 0.4 pounds per square foot.

- B. **Protection.** Protect work and restrict access to protective coating until coating has reached a complete cure.

3.4 FIELD QUALITY CONTROL

- A. **After completion of each coat,** the Contractor shall notify The Engineer/Architect for visual inspection. Proceed with succeeding coats only after inspection and approval of the previous coat by the Engineer/Architect.

3.5 CLEAN UP AND PROTECT

- A. **During the progress of the work,** remove from the site all discarded materials, rubbish, cans, and rags at the end of each day.
- B. **After final cure,** clean wearing surfaces to remove any excess or loose glass granules.
- C. **At the completion of work** of other trades, touch-up and restore all damaged or defaced surfaces.

END OF SECTION

SECTION 13 34 23.05

SMALL METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **General.** Provide the labor, tools, equipment, and materials necessary to furnish and install the metal building systems in accordance with the plans and as specified herein. This section includes all materials and erection required for building to be supplied complete with all necessary component parts, including foundation anchors, to form a complete building system and all parts shall be new and free from all defects or imperfections. The building width and length shall be measured from the outside of the building wall panels and the height of the building shall be the distance measured from the bottom surface of the base channel to the exterior juncture of the roof and sidewall panels.
- B. **This section includes a single-story, single-span,** rigid-frame-type pre-engineered metal building of the nominal length, width, eave height, and gable roof pitch indicated.
1. Exterior walls are covered with field-assembled insulated wall panels attached to framing members using exposed fasteners. End walls are not expandable.
 2. Gable Roof system consisting of the manufacturer's standard standing seam insulated roof.
 3. Manufacturer's standard building components and accessories may be used, provided components, accessories, and complete structure conform to design indicated and specified requirements.
- C. **Related Sections.** The following sections contain requirements that relate to this section:
1. Division 3 – Cast-in-Place Concrete. Concrete floor and foundations and installation of anchor bolts are specified in Division 3 and are to be coordinated with the manufacturer's recommendations.
 2. Sealants and caulking are specified in Division 7.
 3. Sectional Overhead Doors are specified in Division 8.
 4. Fiberglass reinforced plastic (FRP) Doors are specified in Division 8.

5. Finish hardware and provisions for master-keying are specified in Division 8.

1.3 QUALITY ASSURANCE

- A. **Codes and Standards.** Perform all work to furnish and install the metal building systems in compliance with applicable requirements of governing agencies having jurisdiction and in accordance with these plans and as specified herein.
- B. **Installer Qualifications.** Engage an experienced installer to erect the pre-engineered metal building who has specialized in the erection and installation of types of metal buildings systems similar to that required for this project and who is certified in writing by the metal building system manufacturer as qualified for erection of the manufacturer's products.
- C. **Manufacturer Qualifications.** Provide pre-engineered metal buildings manufactured by a firm experienced in manufacturing metal buildings systems that are similar to those indicated for this project and have a record of successful in-service performance.
- D. **Single-Source Responsibility.** Obtain the metal building system components, including structural framing, wall and roof covering, and accessory components, from one source from a single manufacturer.
- E. **Design Criteria.** The drawings indicate size, profiles, and dimensional requirements of the pre-engineered metal buildings and are based on the specific type and model indicated. Metal building systems having equal characteristics by other manufacturers may be considered provided that deviations in dimensions and profiles are minor and do not change the design concept or intended performance as judged by the Engineer/ Architect. The burden of proof of equality is on the proposer.

1.4 SUBMITTALS

- A. **General**
 1. All submittals shall be submitted in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.
- B. **Submittal Package No. 1 – Shop Drawings and Product Data**
 1. Product Data. Product data consisting of metal building system manufacturer's product information for building components and accessories.

2. Shop Drawings. Shop drawings for metal building structural framing system, roofing and siding panels, and other metal building system components and accessories that are not fully detailed or dimensioned in manufacturer's product data.
 - a. Structural Framing. Furnish complete erection drawings prepared by or under the supervision of a professional engineer legally authorized to practice in the jurisdiction where the project is located. Include details showing fabrication and assembly of the metal building system. Show anchor bolts settings and sidewall, end wall, and roof framing. Include transverse cross sections.
 - b. Roofing and Siding Panels. Provide layouts of panels on walls and roofs, details of edge conditions, joints, corners, custom profiles, supports, anchorages, trim, flashings, closures, and special details. Include transverse cross sections.
 - c. Building Accessory Components. Provide details of metal building accessory components to clearly indicate methods of installation including the following:
 - 1) Personnel Doors. Provide elevations and details of each type of door and frame, including anchors and reinforcement; show location and installation requirements for finish hardware. Provide schedule of doors and frames using the same reference numbers for details and openings as those indicated on the drawings; include complete hardware schedule.
 - 2) Sheet Metal Accessories. Provide layouts at 1/4-inch scale. Provide details of ventilators, louvers, gutters, downspouts, pipe penetrations, and other sheet metal accessories at not less than 1-1/2-inch scale showing profiles, methods of joining, and anchorages.

C. Submittal Package No. 2 – Samples for Initial Selection Purposes

1. Samples for Initial Selection Purposes. In the form of manufacturer's color charts or chips showing full range of colors, textures, and patterns available for metal roofing and siding panels with factory-applied finishes.

D. Submittal Package No. 3 – Samples for Verification Purposes and Certification

1. Samples for Verification Purposes. Of roofing and siding panels. Provide sample panels 12 inches long by actual panel width, in the profile, style, color, and texture indicated. Include clips, battens, fasteners, closures, and other panel accessories.

2. Installer Certificates. Signed by metal building manufacturer written certification certifying that the installer complies with requirements included under the "Quality Assurance" Article.
3. Professional Engineer's Certificate. Prepared and signed by a Professional Engineer, legally authorized to practice in the jurisdiction where project is located, verifying that the structural framing and covering panels meet indicated loading requirements and codes of authorities having jurisdiction.

E. Submittal Package No. 4 –Building Code Submittals

1. Provide all request drawings, design calculations, and other miscellaneous submittals as required by the governing authorities during jurisdiction. Submittals shall be in a form acceptable to the governing authority and shall be submitted in a timely manner so as not to delay the plan approval process.

1.5 JOB CONDITIONS

Not used.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. **General.** Deliver prefabricated components, sheets, panels, and other manufactured items so they will not be damaged or deformed. Package wall and roof panels for protection against transportation damage.
- B. **Handling.** Exercise care in unloading, storing, and erecting wall and roof covering panels to prevent bending, warping, twisting, and surface damage.
- C. **Storage/Protection.** Stack materials on platforms or pallets, covered with tarpaulins or other suitable weather tight ventilated covering. Store metal wall and roof panels so that water accumulations will drain freely. Do not store panels in contact with other materials that might cause staining, denting or other surface damage.

1.7 SPECIAL WARRANTY

- A. **Roofing and Siding Panel Finish Warranty.** Furnish the roofing and siding panel manufacturer's written warranty, covering failure of the factory applied exterior finish on metal wall and roof panels within the warranty period. This warranty shall be in addition to and not a limitation of other rights the Owner may
 1. Warranty period for factory-applied exterior finishes on wall and roof panels is 20 years after the date of Substantial Completion.

1.8 SYSTEM PERFORMANCE REQUIREMENTS

- A. **General.** Engineer, design, fabricate and erect the pre-engineered metal building system to withstand loads from winds, gravity, structural movement including movement thermally induced, and to resist in-service use conditions that the building will experience, including exposure to the weather, without failure.
1. Design each member to withstand stresses resulting from combinations of loads that produce the maximum allowable stresses in that member as prescribed in Metal Building Manufacturers Association's (MBMA) "Design Practices Manual."
- B. **Design Loads.** Basic design loads, as well as auxiliary and collateral loads, are indicated on the drawings.
1. Basic design loads include live load, wind load, and seismic load, in addition to the dead load.
 2. Auxiliary loads include dynamic live loads such as those generated by cranes and material handling equipment.
 3. Collateral loads include additional dead loads over and above the weight of the metal building system such as sprinkler systems and roof mounted mechanical systems.
- C. **Structural Framing and Roof and Siding Panels.** Design primary and secondary structural members and exterior covering materials for applicable loads and combinations of loads in accordance with the MBA's "Design Practices Manual."
1. Structural Steel. Comply with the American Institute of Steel Construction's (AISC) "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" for design requirements and allowable stresses.
 2. Light Gauge Steel. Comply with the American Iron and Steel Institute's (AISI) "Specification for the Design of Cold Formed Steel Structural Members" and "Design of Light Gauge Steel Diaphragms" for design requirements and allowable stresses.
 3. Welded Connections. Comply with the American Welding Society's (AWS) "Standard Code for Arc and Gas Welding in Building Construction" for welding procedures.
- D. **Building Accessories.** Provide metal building system accessories that comply with the following criteria:
1. Doors and Frames shall be Fiberglass Reinforced Plastic (FRP) per Specification Section 08 12 50.
 2. Sectional Overhead Doors shall be per Specification Section 08 36 13.
 3. Door hardware shall be stainless steel per Specification Section 08 71 00.

1.9 EXTRA MATERIALS

- A. **Maintenance Stock.** Furnish at least 5 percent excess over required amount of nuts, bolts, screws, washers, and other required fasteners for each metal building. Pack in cartons labeled to identify the contents and store on the site where directed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. **Available Manufacturers.** Subject to compliance with requirements, manufacturers offering metal building systems that may be incorporated in the work include but are not limited to the following:
- B. **Manufacturer.** Subject to compliance with specified requirements, provide metal building systems provided by one of the following:
 - 1. Star Building Systems
 - 2. Parkline, Inc.
 - 3. A&S Building Systems
 - 4. American Buildings Company
 - 5. Or Equal

2.2 MATERIALS

The following materials specifications apply as required for the products used in the approved building system.

- A. **Hot-Rolled Structural Steel Shapes.** Comply with ASTM A 36 or A 529.
- B. **Steel Tubing or Pipe.** Comply with ASTM A 500, Grade B, ASTM A 501, or ASTM A 53.
- C. **Steel Members Fabricated from Plate or Bar Stock.** Provide 42,000 pounds per square inch (psi) minimum yield strength. Comply with ASTM A 529, ASTM A 570, or ASTM A 572.
- D. **Steel Members Fabricated by Cold Forming.** Comply with ASTM A 607, Grade 50.
- E. **Cold-Rolled Carbon Steel Sheet.** Comply with requirements of ASTM A 366 or ASTM A 568.
- F. **Hot-Rolled Carbon Steel Sheet.** Comply with requirements of ASTM A 568 or ASTM A 569.
- G. **Structural-Quality Zinc-Coated (Galvanized) Steel Sheet.** Comply with ASTM A 653 with G90 coating. Grade to suit manufacturer's standards.

- H. **Aluminum Zinc Alloy.** ASTM A792 with coating conforming to AZ%% (55%) standard by hot dipping process.
- I. **Commercial-Quality Zinc-Coated (Galvanized) Steel Sheet.** Comply with ASTM A 653 with G60 coating.
- J. **Aluminum-Coated Steel Sheets.** Comply with ASTM A 463 with T1-40 coating.
- K. **Aluminum Sheets.** Comply with ASTM B 209 for Alclad alloy 3003 or 3004 with temper as required to suit forming operations.
- L. **Bolts for Structural Framing.** Comply with ASTM A 307 or ASTM A 325 as necessary for design loads and connection details.
- M. **Thermal Insulation.** Glass fiber blanket insulation, complying with ASTM C 991, of 0.5 pounds per cubic foot density, thickness as indicated, with UL flame spread classification of 25 or less, and 2 inch wide continuous vapor tight edge tabs.
 - 1. Vapor Barrier. Vinyl reinforced foil or Foil reinforced kraft paper.
 - 2. Retainer Strips. 26-gauge (0.0179-inch) formed galvanized steel retainer clips colored to match the insulation facing.
- N. **Paint and Coating Materials.** Comply with performance requirements of the federal specifications indicated. Unless specifically indicated otherwise, compliance with compositional requirements of federal specifications indicated is not required.
 - 1. Shop Primer for Galvanized Metal Surfaces. Zinc-dust zinc-oxide primer selected by the manufacturer for compatibility with substrate. Comply with FS TT-P-641.

2.3 STRUCTURAL FRAMING

- A. **Framing.** Provide the following framing members:
 - 1. Flange and Sag Bracing. 1 5/8-inch-by-1-5/8-inch angles fabricated from 16-gauge (0.0598-inch) shop-painted roll-formed steel.
 - 2. Base or Sill Angles. Fabricate from 14-gauge (0.0747-inch) cold-formed galvanized steel sections.
 - 3. Secondary end wall structural members, except columns and beams, shall be the manufacturer's standard sections fabricated from 14-gauge (0.0747-inch) cold-formed galvanized steel.
- B. **Wind Bracing.** Provide adjustable wind bracing using 1/2-inch-diameter threaded steel rods or manufacturer standard units; comply with ASTM A 36 or ASTM A 572, Grade D. Locate interior end bay bracing only where indicated.

- C. **Bolts.** Provide shop-painted bolts except when structural framing components are in direct contact with roofing and siding panels. Provide zinc-plated or cadmium-plated bolts when structural framing components are in direct contact with roofing and siding panels.
- D. **Shop Painting.** Clean surfaces to be primed of loose mill scale, rust, dirt, oil, grease, and other matter precluding paint bond. Follow procedures of Steel Structures Painting Council (SSPC) SP3 for power tool cleaning, SSPC-SP7 for brush off blast cleaning, and SSPC-SP1 for solvent cleaning.
 - 1. Prime structural steel primary and secondary framing members with the manufacturer's standard rust-inhibitive primer.
 - 2. Prime galvanized members, after phosphoric acid pretreatment, with manufacturer's standard zinc-dust zinc-oxide primer.

2.4 ROOFING AND SIDING PANELS

A. Roof and Ceiling Panels.

- 1. General. Roof panels shall be supplied in a single continuous length from eave line to eave line or ridge line and shall be designed to tightly interlock so that no fasteners are required at intermediate points along the panel side laps. Roof panels shall be 16" or 12" wide with a smooth surface between the interlocking side ribs. The interlocking ribs shall be a minimum 3" high, and shall be turned upward. All roof panels shall be factory punched for connection at the eave line of the building.
- 2. Fasteners. There shall be no fastener penetrations through the roof covering except at eave lines, ridge lines and roof accessory openings such as skylights and ventilators.
- 3. Finish. Roof panels shall be a nominal 26 gauge steel coated on both sides with a coating of corrosion resistant aluminum-zinc alloy conforming to ASTM A 792 specification with the coating conforming to AZ55 (55%) standard by a continuous hot dipping process. Coating weight shall be a minimum of 0.50 oz. of aluminum-zinc alloy per square foot of coated sheet equivalent to about 0.8 mil thickness on each side. Minimum yield strength of panel material shall be 50,000 PSI.
- 4. Ceiling Panels. The metal ceiling system consists of 3" deep 16" wide interlocking panels of nominal 24 gauge embossed galvanized steel, factory painted White. The ceiling system is supported at its perimeter by concealed angles and hook bolts. The ceiling system is furnished complete with all necessary connectors and fasteners.
- 5. Insulation. The ceiling shall be insulated with 2 layers of 16" wide by 3 1/2" thick R-26 unfaced fiberglass insulation laid at right angles to the panel ribs. The "U" value through the finished ceiling would be a maximum of 0.05 BTU's per square foot (R21.3) when calculated in accordance with the "Zone Method" contained in ASHRAE "Handbook of Fundamentals", 1981 edition. Eave height -9".

B. Wall Panels.

1. General. Exterior wall panels of the building shall be a single continuous length from the base channel to the roof line of the building at the sidewalls and end walls of the building except where interrupted by wall openings.
2. Dimensions.
 - a. Exterior Wall Panels. Wall panels shall be 16" wide with a 3" deep inward turned interlocking side rib. Wall panels shall contain two 3/4" deep by 3-1/8" wide fluted recesses, each starting 2-7/16" from the panel edge.
 - b. Interior Liner Wall Panels. Interior liner wall panels shall be flat with maximum coverage of 32-inches with 1/4-inch high by 1-inch ribs at 8" centers.
3. Fasteners. Wall panels shall be fastened internally to the base channel and eave cap of the building with 3/8" diameter electro-galvanized machine bolts placed within the panel interlock. The fastening system shall be designed so that no wall fasteners are exposed on the exterior surface of the walls.
4. Material Properties. Wall panels shall be nominal 24 gauge galvanized steel conforming to ASTM A-653 specifications with the galvanized coating conforming to G90 (1.25 oz. commercial) standards. Minimum yield strength of panel material shall be 40,000 PSI. Panel material shall be embossed with a random pattern pebble embosser of approximately .007 - .008 depth.
5. Coatings.
 - a. All exterior surfaces of the galvanized steel wall covering and exterior trim shall receive a factory, roller applied, paint coating having an exterior coating thickness of 0.8 to 1.2 mils of dry film thickness. The finish coat for wall panels shall be a siliconized polyester formulation of one of the Manufacturer's standard colors. Interior Liner panel color shall be white.
 - b. The wall panel color coating shall carry a low fire hazard rating equal to a Class 1 material as defined by Factory Mutual. The panel coating shall have achieved a Flame Spread Index of 0 and a Fuel Contributed Index of 5 or less when tested in accordance with ASTM E-84 test procedures.
 - c. Exterior color coatings shall meet the following performance standards after 10 years continuous exposure in normal atmospheric conditions not containing corrosive fumes such as chemical fumes or salt spray.
 - 1) Panels shall show no evidence of blistering, peeling, or chipping.
 - 2) Panels shall not show surface chalking in excess of the No. 8 rating D659 as established by the American Society of Testing Materials (ASTM).
 - 3) Panels, after cleaning, shall not show color change in excess of five (5) NBS units when measured in accordance with the ASTM D-2244 standard.
 - 4) The above performance standards shall not apply where panels have been damaged by fire, radiation or other physical damage.
6. Insulation. Interior wall insulation shall be 3-1/2" R13 fiberglass.

- C. **Fasteners.** Self-tapping screws, bolts, nuts, self-locking rivets, self-locking bolts, end welded studs, and other suitable fasteners designed to withstand design loads.
 - 1. Provide metal backed neoprene washers under heads of fasteners bearing on weather side of panels.
 - 2. Use aluminum or stainless steel fasteners for exterior application and galvanized or cadmium plated fasteners for interior applications.
 - 3. Locate and space fastenings in true vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of neoprene washer.
 - 4. Provide fasteners with heads matching color of roofing or siding sheets by means of plastic caps or factory applied coating.

- D. **Accessories.** Provide the following sheet metal accessories factory-formed of the same material in the same finish as roof and wall panels.
 - 1. Flashings.
 - 2. Closers.
 - 3. Fillers.
 - 4. Metal expansion joints.
 - 5. Ridge covers.
 - 6. Fascias.

- E. **Flexible Closure Strips.** Closed cell, expanded cellular rubber, self-extinguishing flexible closure strips. Cut or premold to match configuration of roofing and siding sheets. Provide closure strips where indicated or necessary to ensure weathertight construction.

- F. **Sealing Tape.** Pressure sensitive 100 percent solids grey polyisobutylene compound sealing tape with release paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

- G. **Joint Sealant.** One part elastomeric polyurethane, polysulfide, or silicone rubber sealant as recommended by the building manufacturer.

2.5 PERSONNEL DOORS

- A. **General.** Provide openings to accept FRP doors and frames specified in Division 8 and as shown on the plans. Contractor is responsible for coordinating matching of openings and doors between the respective manufacturers.

2.6 SHEET METAL ACCESSORIES

- A. **General.** Provide aluminum sheet metal accessories with aluminum roofing and siding panels.

- B. **Gutters.** Form in 8-foot-long sections, complete with end pieces, outlet tubes, and other special pieces as required. Size in accordance with Sheet Metal and Air Conditioning Contractors' National Association (SMACNA). Join sections with riveted and soldered or sealed joints. Provide expansion type slip joint at center of runs. Furnish gutter supports spaced 36 inches on center, constructed of same metal as gutters. Provide bronze, copper, or aluminum wire ball strainers at outlets. Finish to match roof fascia and rake.
- C. **Downspouts.** Form in 10-foot-long sections, complete with elbows and offsets. Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 5 feet on center in between. Finish to match wall panels.
- D. **Wall Louvers.** Provide louvers, size and design indicated, of 18-gauge (0.0478-inch) steel. Fold or bead blades at edges, set at an angle that excludes driving rains, and secure to frames by riveting or welding. Finish to match wall panels.
 - 1. Provide vertical mullions for louvers 4 feet and more in width, with one mullion for each 4 feet of width.
 - 2. Provide flanges on interior face of frames where air intake or exhaust louvers are indicated to be connected with mechanically operated dampers or metal ductwork.
 - 3. Provide 1/2" x 1/2" galvanized steel mesh bird screens in rewirable frames on exterior face of louvers. Secure with clips to ensure ease of removal for cleaning and rewiring. Fabricate screens and frames of same type metal as louvers.

2.7 FABRICATION

- A. **General.** Design prefabricated components and necessary field connections required for erection to permit easy assembly and disassembly.
 - 1. Fabricate components in such a manner that once assembled, they may be disassembled, repackaged, and reassembled with a minimum amount of labor.
 - 2. Clearly and legibly mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
- B. **Structural Framing.** Shop-fabricate framing components to indicated size and section with base plates, bearing plates, and other plates required for erection, welded in place. Provide holes for anchoring or connections shop drilled or punched to template dimensions.
 - 1. Shop Connections. Provide power riveted, bolted, or welded shop connections.
 - 2. Field Connections. Provide bolted field connections.

PART 3 - EXECUTION

3.1 ERECTION

- A. **Framing.** Erect framing true to line, level, plumb, rigid, and secure. Level base plates to a true even plane with full bearing to supporting structures, set with double nutted anchor bolts. Use a nonshrinking grout to obtain uniform bearing and to maintain a level base line elevation. Moist cure grout for not less than 7 days after placement.
- B. **Purlins and Girts.** Provide rake or gable purlins with tight fitting closure channels and fascias. Locate and space wall girts to suit door and window arrangements and heights. Secure purlins and girts to structural framing and hold rigidly to a straight line by sag rods.
- C. **Bracing.** Provide diagonal rod or angle bracing in roof and sidewalls as indicated.
 - 1. Movement resisting frames may be used in lieu of sidewall rod bracing, to suit manufacturer's standards.
 - 2. Where diaphragm strength of roof or wall covering is adequate to resist wind forces, rod or angle bracing will not be required.
- D. **Framed Openings.** Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to building structural frame.

3.2 ROOFING AND SIDING

- A. **General.** Arrange and nest sidelap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line. Protect factory finishes from damage.
 - 1. Field cutting of exterior panels by torch is not permitted.
 - 2. Provide weather-seal under ridge cap. Flash and seal roof panels at eave and rake with rubber, neoprene, or other closures to exclude weather.
- B. **Wall Sheets.** Install wall system per manufacturer's requirements. Handle and apply any sealants and backup in accordance with the sealant manufacturer's recommendations.
 - 1. Align bottom of wall panels and fasten panels with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws. Fasten window and door frames with machine screws or bolts. When building height requires two rows of panels at gable ends, align lap of gable panels over wall panels at eave height.
 - 2. Install screw fasteners with power tools having controlled torque adjusted to compress neoprene washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
 - 3. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

- C. **Sheet Metal Accessories.** Install gutters, downspouts, ventilators, louvers, and other sheet metal accessories in accordance with manufacturer's recommendations for positive anchorage to building and weathertight mounting. Adjust operating mechanism for precise operation.
- D. **Hollow Metal Doors and Frames.** Install doors and frames straight, plumb, and level. Securely anchor frames to building structure. Set units with 1/8 inch maximum clearance between door and frame at jambs and head and 3/4 inch maximum between door and floor. Adjust hardware for proper operation.
- E. **Thermal Insulation.** Install insulation concurrently with installation of ceiling and wall panels in accordance with manufacturer's directions. Install blankets straight and true in one piece lengths with both sets of tabs sealed to provide a complete vapor barrier. Locate insulation on underside of roof sheets, extending across the top flange of purlin members and held taut and snug to roofing panels with retainer clips. Install retainer strips at each longitudinal joint, straight and taut, nesting with roof rib to hold insulation in place.
- F. **Cleaning and Touch-Up.** Clean component surfaces of matter that could preclude paint bond. Touch up abrasions, marks, skips, or other defects to shop primed surfaces with same type material as shop primer. Coat non-building surfaces in accordance with specification section 09 90 00, as applicable.

END OF SECTION

SECTION 26 00 00

ELECTRICAL WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions and all other sections related to electrical work, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Provide the labor, tools,** equipment, and material with supervision to implement complete, operable systems in accordance with the plans and as specified herein.
- B. **Install and connect all appliances** and equipment as specified and indicated for this project, in accordance with the manufacturer's instructions and recommendations. Furnish and install complete electric connections and devices as recommended by the manufacturer or required for proper operation.

1.3 QUALITY ASSURANCE

- A. **Codes and Standards.** Perform all work in compliance with applicable requirements of governing agencies having jurisdiction (local and State codes) and with latest edition of the National Electrical Code (NEC) and National Fire Protection Association (NFPA).
- B. All electrical equipment shall be listed and labeled by Underwriters' Laboratories, Inc. (UL) or any approved independent nationally recognized electrical testing laboratory where such standards exist. Optionally, in lieu of such listing and labeling, equipment preapproved by the Electrical Inspector may be supplied. Wherever UL compliance is mentioned in the specifications, the above alternatives shall be understood to apply to all listing and labeling requirements. This does not preempt or replace the specifications or replace the approval process. All service switches/circuit breakers shall be labeled as outlined above for service entrance duty.
- C. Comply with the requirements of NFPA Code 241 "Building Construction and Demolition Operations," the American National Standards Institute (ANSI) A10 Series standards for "Safety Requirements for Construction and Demolition," and the National Electrical Contractors Association (NECA) National Joint Guideline NJG 6 "Temporary Job Utilities and Services."
- D. **Permits and Fees.** Obtain all permits and inspections required by laws, obtain certificates of such inspections, and pay all fees in connection therewith. Furnish certificate(s) of final inspection(s) from the proper authority to Owner prior to final payment. Obtain and pay for easements as required.

1.4 SUBMITTALS

- A. **Prepare and submit** complete submittal list to Engineer/Architect. The submittal list shall contain dates for submission and shall be coordinated with the construction schedule prior to submittal.
- B. **Shop Drawings.** Shop drawings shall identify the specific equipment and/or material being supplied, and all accessories, dimensions, descriptions, mounting and connection details, wiring diagrams, and any other information necessary to determine compliance with the plans and specifications.
- C. **Coordination Drawings.** Provide for approval coordination drawings for main service entrance equipment and all areas with tight fit. Prepare reflected ceiling plans to coordinate heating, ventilating, and air-conditioning (HVAC) equipment, lighting fixtures, systems, equipment, sprinklers, and other ceiling-mounted devices.
- D. **Record Documents.** Prepare as-built documents as work progresses and submit to Owner prior to final payment.
- E. **Maintenance and Operation Manuals.** Provide complete manuals to Owner with manufacturer's printed materials, maintenance procedures, and address and telephone number of manufacturer's authorized service location.

1.5 JOB CONDITIONS

Not used.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. **Deliver products to the project** identified with names, model numbers, types, grades, compliance labels, manufacturing date, and other information needed for identification.
- B. **Store and handle all materials** as per manufacturer's recommendations.

1.7 SPECIAL WARRANTY

- A. **Provide special warranty** for 12 months from date of final acceptance for all materials including installation.

1.8 SPECIFICATIONS AND DRAWINGS

- A. **Be familiar with the terms** and abbreviations used in the trade. In the event that any abbreviation used in these specifications or on the drawings is not clear, request clarification during the bidding period. The failure to understand any such term or abbreviation shall not be used as a basis for a change in the contract cost.
- B. **Include any work shown on drawings** and not particularly described in the trade specifications or specified and not shown on the drawings.
- C. **The lists of equipment,** tabulations of data, and schedules appearing in the specifications or on the drawings are included only for the assistance and

guidance of the Contractor in arriving at a more complete understanding of the intended installation. They are not intended, nor to be construed, as relieving the responsibility of the Contractor in making Contractor's own takeoff and providing all the required work.

1.9 ACCESS TO EQUIPMENT

- A. **Locate starters, switches, receptacles, pull boxes, etc.**, to provide for easy access for operations, repair, and maintenance; if concealed, access doors shall be provided.

1.10 MATERIAL AND WORKMANSHIP

- A. **All equipment and materials shall conform** to requirements of applicable standards and be suitable in the opinion of the Engineer/Architect for conditions where they shall be installed. Each item shall be tested by nationally recognized independent testing laboratories and shall bear their seal, label, or stamp.
- B. **All work installed under this division** of the specifications shall be first class and complete in both effectiveness and appearance, whether finally concealed or exposed, and shall be executed by experienced electricians.

1.11 SCHEDULING

- A. **It is mandatory that the facility be maintained** in operation during construction and that periods of shutdown due to line changeovers, etc., are held to a minimum. The outages must be scheduled with and have the concurrence of the Engineer/Architect and the Owner. Further, it is mandatory that the completion of various stages of the electrical work coincide with the other phases of construction to maintain operation of present facilities and permit operation of new installation as construction progresses.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. **Provide subbase material** which is mixture of crushed gravel, crushed stone, crushed slag, and sand. Provide drainage fill washed and evenly graded mixture, and provide backfill materials which comply with American Society for Testing and Materials (ASTM) D 2487 Soil Classification Groups GW, GP, GM, SM, SW, and SP.

2.2 RACEWAYS

- A. **Conduits and Fittings**
 - 1. Metal Conduit. Rigid aluminum conduit, intermediate metallic conduit, and electric tubing shall be hot-dipped galvanized inside and outside as manufactured by Allied Tube, Robroy Industries, or Wheatland Tube.
 - 2. Nonmetallic Conduits. Rigid, heavy-wall Schedule 40 and Schedule 80 polyvinyl chloride (PVC) conduit.

3. Provide conduit, tubing, and duct accessories of types, sizes, and materials complying with manufacturer's recommendation and National Electrical Code (NEC) requirements.

B. **Wireways.** Electrical wireways shall be of type, size, and number of channels as indicated. Fittings and accessories shall match and mate with wireways. Wireway cover shall be gasketed and hinged type. Wireway shall be as manufactured by Anchor Electric, G.S. Metal, or Square D.

2.3 WIRE, CABLES, AND CONNECTIONS

- A. **Copper conductors with conductivity** not less than 98 percent at 20 degrees Celsius (° C.). Insulation shall be THW or THHN or THWN with minimum rating of 600 volts.
- B. **Provide factory-fabricated metal connector** and terminals of size, capacity, materials, types, and classes as required.
- C. **Clearly marked with size**, type, manufacturer, voltage, and Underwriters' Laboratories, Inc. (UL) listing at regular intervals; reel or container shall indicate the year of manufacture.
- D. **Provide wire and cable** as manufactured by Rome Cables, American Insulated Wire, or Belden Corporation.

2.4 CABINETS, BOXES, AND FITTINGS

- A. **Electrical cabinets, boxes, and fittings** of indicated types, sizes, and National Electrical Manufacturers Association (NEMA) enclosure classes. Where not indicated, provide units of types, sizes, and classes appropriate for use and location. Provide all items complete with covers and accessories required for the intended use. Provide gasket for units in wet or damp locations and provide air-sealing gaskets for units mounted in exterior walls.
- B. **Materials and Finishes**
1. Outlets and Pull Boxes. Provide code gauge, galvanized steel which is flat-rolled with corrosion-resistant cadmium- and zinc-plated hardware.
 2. Cabinets and Enclosures. Provide 16-gauge galvanized sheet steel with continuous welded seams, National Electrical Manufacturers Association (NEMA) class indicated. Door shall be hinged directly to cabinet and removable, with 3/4-inch flange around all edges. Provide concealed lock with keys alike.

2.5 WIRING DEVICES

- A. **All wiring devices shall be suitable** for intended purpose and for locations.
- B. **Receptacles, industrial heavy-duty, pin-and-sleeve design** minimum NEMA 5-20R duplex.

- C. **Ground Fault Circuit Interrupter Receptacle.** Feed-through type with integral heavy-duty NEMA 5-20R duplex receptacle, arranged to protect connected downstream receptacles on same circuit.
- D. **Switches.** Quiet-type alternating-current switches to be used with 120/277-volt and 20-amp circuits.
- E. **Dimmer Switches.** Solid-state, modular-type dimmer switch for incandescent and/or fluorescent fixtures. Voltage and wattage ratings as required depending upon number of fixtures in circuit. Equip with electromagnetic filter to minimize noise, radio frequency and television interference. Construct with continuously adjustable trim potentiometer, anodized heat sink, and quiet on-off switch.
- F. **Wiring Device Accessories**
 - 1. Wall Plates. Single or combination 0.04-inch-thick, Type 302 stain-finished stainless steel. Size as required.
 - 2. Weatherproof cover shall be rainproof while in use. There shall be a neoprene gasket between the enclosure and the mounting surface and between the cover and base to ensure proper seal.

2.6 SUPPORTING DEVICES

A. Coatings

- 1. Supports, support hardware, and fasteners shall be protected with zinc coating or with treatment of equivalent corrosion-resistance using approved alternative treatment, finish, or inherent material characteristic. Products for use outdoors shall be hot-dip galvanized unless material is inherently corrosion resistant.

B. Manufactured Supporting Devices

- 1. Provide raceway supports including clevis hangers, riser clamps, conduit straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring steel clamps. Maximum spacing of support shall be 5 feet.
- 2. Provide fasteners of types, materials, and construction features as follows:
 - a. Expansion anchors of carbon steel wedge or sleeve type.
 - b. Toggle bolts of all-steel springhead type.
 - c. Power-driven threaded studs of heat-treated steel, designed specifically for the intended service.
- 3. Conduit Seals. Provide factory-fabricated watertight conduit sealing bushing assemblies suitable for sealing around conduit, or tubing passing through concrete floors and walls. Provide a cast-in-place water stop wall sleeve with a mechanical pipe seal between the conduit and the sleeve. Construct seals with steel sleeve, malleable iron body, neoprene

sealing grommets or rings, metal pressure rings, pressure clamps, and cap screws.

4. Provide cable supports for vertical conduit that are a factory-fabricated assembly consisting of thread body and insulating wedging plug for nonarmored electrical cables in riser conduits. Provide plugs with number and size of conductor gripping holes as required to suit individual risers. Construct body of malleable iron casting with dip-galvanized finish.
5. Provide U-channel systems of 16-gauge stainless steel channels, with 9/16-inch-diameter holes, at a minimum of 8 inches on center, in top surface. Provide fittings and accessories that mate and match with U-channel and are of the same manufacturer.

2.7 ELECTRICAL IDENTIFICATION

- A. **Engraving stock melamine plastic laminate**, 1/16 inch minimum thick for sign up to 20 square inches, or 8 inches in length; 1/8 inch thick for larger sizes. Engrave legend in white letters on black face and punch for mechanical fasteners.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. **Verify final locations** for rough-ins with field measurements and with the actual equipment to be connected.
- B. **Sequence, coordinate, and integrate** the various elements of electrical systems, materials and equipment. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components. Install access door where units are concealed behind surfaces.
- C. **Install all equipment/devices** where indicated on drawings and with conformation of the NEC and local and federal authorities.
- D. **Test all equipment** as per manufacturer's recommendations and standard industry practice and as directed in field.

3.2 CUTTING AND PATCHING

- A. **Perform cutting of all surfaces** as required by electrical work. Legally dispose of all used materials and equipment which Owner does not want for future use. Patch all surfaces to match finish with adjacent surfaces.

3.3 ELECTRICAL DEMOLITION

- A. **Existing Conduit Location**
 1. In existing structures at this project, there is electrical conduit embedded in concrete. It shall be the responsibility of the Contractor , under this

specification section, to attempt to locate and mark the existence of any conduit embedded in areas where, as part of this Contract, the concrete is to be drilled or cut into for any purpose.

2. Contractor shall use every available means possible to attempt to locate existing conduit. Whenever a hole is to be cut into an existing slab, wall, or other structural concrete, that area shall be x-rayed prior to drilling to show the locations of conduits and reesteels.

B. Removal and Relocation of Existing Electrical Apparatus

1. Remove and store or relocate all existing electrical apparatus as shown on the drawings, as specified herein, or as necessary for the completion of this Contract except where specifically called for to be included under another section of the Contract.
2. Where existing electrical equipment, including light fixtures, is shown to be removed, remove the existing branch wiring.
 - a. Wiring removal shall extend to the branch disconnect or to the next piece of utilization equipment.
 - b. Where new or existing equipment is to be reinstalled, the wiring may be temporarily terminated.
3. Where part of the existing equipment on a branch circuit is to be disconnected, de-energize the circuit only long enough to disconnect the equipment and terminate the wiring that is to remain.
4. Maintain continuity of circuit for the existing devices and fixtures which are to remain in service. Reroute and/or extend circuit from existing circuits or new circuits as indicated or as required.
5. All equipment and major lengths of wiring retired and removed shall remain the property of the Owner unless shown or directed otherwise and shall be placed in storage on the site by the Contractor where ordered.
6. When pumps, motors, or other apparatus is being removed under other sections of this Contract, all electrical wiring, conduit, boxes, and related equipment shall be completely removed under this Division 26.
7. Removal of all equipment shall include the removal of all accessories incidental to the major units. Where wiring is removed from conduit and boxes, the accessible conduit and boxes shall also be removed.
8. When the Contract is complete, no piece of electrical equipment shall remain installed that is not in service unless otherwise ordered.
9. Where electrical conduit, boxes, or appurtenances are embedded in walls or slabs, and wires, wiring devices, fixtures, or other apparatus is removed from these embedded items, the conduits shall be cut off flush with the surface and plugged with masonry to a smooth surface and the

boxes and other appurtenances covered with suitable approved stainless steel cover plates. The cover plates shall have stainless steel fasteners.

10. Electrical equipment or components supported by materials or equipment being removed under this or other Divisions in this Contract shall be temporarily supported during the demolition process and then properly and permanently resupported prior to the conclusion of this Contract. All supports shall meet the applicable requirements of this Division.
11. Any electrical equipment or components damaged during the performance of this Contract shall be replaced and repaired to a like-new condition in accordance with the requirements of this Division.

3.4 CLEANING, POLISHING, AND PAINTING

A. **General.** When all work is completed and has been tested and accepted by the Engineer/Architect, clean all light fixtures, equipment, and exposed surfaces that have been directly affected by this work. At all times keep the premises in a neat and orderly condition, and at the completion of the work, properly clean up and remove from the site any excess materials.

B. **Additional Requirements**

1. Remove labels, dirt, paint, grease, and stains from exposed devices, equipment, and fixtures affected under this Contract.
2. Clean and polish same to present a first-class workmanlike job ready and suitable for use by occupants.
3. Vacuum-clean equipment, including current-conducting components and compartments, immediately before testing and immediately before putting equipment into service.
4. Touch up or fully paint with matching colors all marred, scratched, or rusty surfaces or devices/equipment installed or existing devices/equipment marred or scratched during construction.

3.5 EXCAVATION AND BACKFILL

A. **Perform all excavation necessary** to install the required electrical work. Backfill and restore all surfaces to their original condition after electrical installation is completed, coordinating the excavating and backfilling with other trades. Schedule all service outages with approval of the Owner. Be extra careful about all existing underground services. Repair any damage done to existing services immediately, and pay for all damages done due to interruption of utility services.

3.6 RACEWAY INSTALLATION

A. **Size raceways to meet** NEC requirements, except no conduit shall be smaller than 3/4 inches for interior applications, 1 inch for exterior applications and underground applications. The diameter of embedded conduits shall not exceed one-third of the slab or wall thickness.

- B. **Conduit installed in finished area** shall be concealed in walls or slabs or above suspended ceilings. In unfinished areas, conduit shall be exposed except concealed in floor slabs.
- C. **Unless indicated for all underground installation**, conduits shall be 24 inches below grade for circuits 600 volts or less.
- D. **Use Permitted.** Use RGS or IMC for all other indoor and outdoor above ground installations. For underground, use Schedule 80 polyvinyl chloride (PVC) conduit with transition from PVC to RGS for riser above grade.

3.7 WIRE AND CABLE INSTALLATION

- A. **Size conductors to meet** NEC requirements except that power wiring shall be No. 12 American wire gauge (AWG) minimum and control wiring, No. 14 AWG minimum. Use larger size where length poses a voltage-drop problem. Conductor shall be sized such that voltage drop does not exceed 3 percent for branch circuits or 5 percent for total.
- B. **Use raceway for all wiring;** pull conductors simultaneously in same raceway and use Underwriters' Laboratories, Inc. (UL) listed pulling compound where necessary.
- C. **Pull insulated green grounding conductors** with each circuit.
- D. **Field Quality Control.** Measure the insulation resistance at 100 volts of dc with meggar between phases and from each phase to ground for each circuit. If any insulation resistance measures less than 50 megohms, the conductor shall be replaced and tested again. Submit tabulated test report to Engineer/Architect for approval. All belowgrade service shall be tested in water-immersion condition.

3.8 PULL BOX INSTALLATION

- A. **Install pull box** so that no more than three equivalents of 90-degree bends are installed in one conduit run.

3.9 WIRING DEVICE INSTALLATIONS

- A. **Mount all wall switches** at 48 inches and all receptacles and all outlets 18 inches above finished floor. Mount abovecounter receptacles, outlets, and switches 6 inches above countertop.
- B. **Energize and test** all wiring devices at least six times. Test ground fault circuit interrupter with local and remote fault simulations.

3.10 RACEWAY SUPPORT INSTALLATIONS

- A. **Support all raceway** minimum every 5 feet center. Provide support within 12 inches on both sides of any fitting or boxes.

3.11 ELECTRICAL IDENTIFICATION INSTALLATION

- A. **Identify all panelboard**, cabinets, enclosures, access doors, each unit of switchgears, each unit of MCC, motor starters, transformers, disconnect switches, control panels, and all other devices as indicated in field. Unless otherwise indicated, provide designation of unit, which unit it is providing service to, and voltages.

3.12 GROUNDING

- A. **Ground electrical systems and equipment** in accordance with NEC requirements as directed by local authorities. Provide ground rods, conductors, and connectors as required.

3.13 PANELBOARD DIRECTORIES

- A. **Provide typewritten directories** in plastic pocket inside of door in each panelboard.

END OF SECTION

SECTION 26 00 01

BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to this section.
- B. **Related Sections.** The following sections contain requirements that relate to this section:
 - 1. Division 26 Section 26 00 00 ELECTRICAL WORK”

1.2 DESCRIPTION OF WORK

- A. **General.** The Electrical Contractor shall provide the labor, tools, equipment, and materials necessary to implement the following general administrative and procedural requirements in accordance with the plans and as specified herein.
- B. **Extent of Work.** Work under this contract consists of furnishing, installing, testing, and guarantee of complete electrical systems as shown on the drawings and as specified in Division 40 Instrumentation and in Division 26. The Contractor shall connect and place all wired equipment in proper working order. Refer to the plans and specifications for work included in this Contract. Some general guidelines to coordinating work between Division 26 and Divisions 23, 40, 43, and 44 are as follows:
 - 1. Division 26 includes all power wiring and raceways for Division 23 equipment. Division 26 is responsible to furnish and install disconnect switches for Division 23 equipment. Remote two-wire control logic will be extended to the motor starters as work of Division 23. Where combined line voltage power/control is used for Division 23 equipment, the wiring and raceways are treated as power wiring and are work of Division 26. All Division 26 work for Division 23 equipment is shown on the plans.
 - 2. Division 26 includes all three phase power for plant equipment provided under Divisions 40, 43, and 44. The instrumentation and control system as specified in Division 40 is the work of Division 26. Field wiring for plant equipment is work of Division 26. All Division 26 work for Divisions 40, 43, and 44 equipment is shown on the plans. Small diameter piping to and from flow sensor to differential transmitter is the responsibility of the General Contractor.

3. No generalities regarding the coordination of work with the work of Divisions other than 40, 43, and 44 can be made. See the plans for the extent of these requirements for Division 26 work.

1.3 QUALITY ASSURANCE

A. **Codes and Standards.** Perform all work in compliance with applicable requirements of governing agencies having jurisdiction and in accordance with these plans and as specified herein.

1. All work shall be installed in full accordance with the latest edition of the National Electrical Code (NEC) as prepared and published by the National Fire Protection Association (NFPA) and any applicable local or state codes. All electrical equipment shall be listed and labeled by Underwriters' Laboratories, Inc. (UL) or any approved independent nationally recognized electrical testing laboratory where such standards exist. Optionally, in lieu of such listing and labeling, equipment preapproved by the Electrical Inspector may be supplied. Wherever UL compliance is mentioned in the specifications, the above alternatives shall be understood to apply to all listing and labeling requirements. This does not preempt or replace the specifications or replace the approval process. All service switches/circuit breakers shall be labeled as outlined above for service entrance duty.
2. Comply with the requirements of NFPA Code 241 "Building Construction and Demolition Operations," the American National Standards Institute (ANSI) A10 Series standards for "Safety Requirements for Construction and Demolition," and the National Electrical Contractors Association (NECA) National Joint Guideline NJG-6 "Temporary Job Utilities and Services."

B. Permits and Regulations

1. The Owner shall obtain all permits required by laws, ordinances, rules, regulations, and public authority having jurisdiction and shall pay all fees. The Contractor shall obtain certificates of inspections and shall submit same to the Engineer/Architect. The Contractor shall furnish to the Owner a certificate of final inspection from the proper authority prior to final payment. Obtain and pay for easements required to bring temporary utilities to the site, where the Owner's easement cannot be utilized for that purpose.

1.4 SUBMITTALS

A. **Transmittals.** Furnish manufacturer's product data, test reports, and materials certifications as required.

1. Follow the procedures specified in Division 1 section "Submittals" and in addition, the Contractor shall prepare and submit a complete submittal list to the Engineer/Architect. The submittal list shall include all submittal items covered in the Division 26 specification sections. In addition, the submittal list shall contain dates for all items to be

submitted and shall accompany the first submittal. The submittal list shall be coordinated with the construction schedule and shall clearly show such coordination.

2. Shop Drawings. Shop drawings shall be submitted to the Engineer/Architect for approval. Shop drawings shall identify the specific equipment and material being supplied; the quantity being supplied; and all accessories, dimensions, descriptions, mounting and connection details, wiring diagrams, elementary control diagrams, equipment interface diagrams, and any other information necessary to determine compliance with the plans and specifications. Typical shop drawing review will require 10 working days following receipt of all information necessary to determine compliance with the plans and specifications. If the submittal schedule or actual submittal contains too large a quantity to allow a 10 day turnaround, the Contractor will be so informed as early as possible. The added number of days required for review will be determined at that time. Fabrication and installation shall be in accordance with the approved shop drawings.
3. Permits and Easements. Submit copies of reports, permits, and easements necessary for installation, use, and operation.
4. Test Reports. Submit copies of reports of tests and inspections as specified.
5. Increase, by the quantity listed below, the number of electrical related shop drawings, product data, and samples submitted, to allow for required distribution plus two copies of each submittal required, which will be retained by the Engineer/Architect.
 - a. Shop Drawings - Initial Submittal. One additional blue or black line print.
 - b. Shop Drawing - Final Submittal. One additional blue or black line print.
 - c. Product Data. One additional copy of each item.
 - d. Samples. One addition as set.

B. Record Documents

1. Prepare record documents in accordance with the requirements in Division 1 section "Project Closeout." In addition to the requirements specified in Division 1, indicate installed conditions for:
 - a. Major raceway systems, size and location, for both exterior and interior; locations of control devices; distribution and branch electrical circuitry; and fuse and circuit breaker size and arrangements.
 - b. Equipment locations (exposed and concealed), dimensioned

from prominent building lines.

- c. Approved substitutions, Contract Modifications, and actual equipment and materials installed.
2. Engage the services of a Land Surveyor or Professional Engineer registered in the state in which the project is located as specified in Division 1 Section "Field Engineering" to record the locations and invert elevations of underground installations.

C. Maintenance Manuals

1. Prepare maintenance manuals in accordance with Division 1 section "Project Closeout." Compile and assemble the operation and maintenance data of equipment specified in Division 16 into a separate set of vinyl covered three ring binders, tabulated and indexed for easy reference. Data shall clearly indicate all options and accessories.
2. In addition to the requirements specified in Division 1, include the following information for equipment items:
 - a. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
 - b. Manufacturer's printed operating procedures to include start up, break in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
 - c. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
 - d. Servicing instructions and lubrication charts and schedules.
 - e. Spare parts list as required by individual Division 26 sections.

1.5 JOB CONDITIONS

Not used.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. **Deliver products** to the project identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

1.7 SPECIAL WARRANTY

- A. **Compile and assemble** the warranties specified in Division 26 into a separate set of vinyl covered three ring binders, tabulated and indexed for easy reference.
- B. **Provide** complete warranty information for each item. Information to include:
 - 1. Product or equipment list.
 - 2. Date of beginning of warranty or bond.
 - 3. Duration of warranty or bond.
 - 4. Names, addresses, and telephone numbers and procedures for filing a claim and obtaining warranty services.

1.8 DEFINITIONS

- A. **Finished Areas.** In general, areas with carpet or tile floors, lay-in or fixed ceiling tile, special architectural ceiling treatment, or tiled, plastered, or paneled walls shall be considered finished areas.
- B. **Interior.** For the purposes of this specification, interior is any area within the boundaries of the foundation of any building within the superstructure or other structures not classified as a building.
- C. **Hazardous (Classified) Areas.** Hazardous (classified) areas are designated on the drawings in conformance with the National Electrical Code (NEC). All equipment and the installation shall conform to requirements for installation in the designated hazardous area as described in Articles 500, 501, and 504 of the NEC.

1.9 COORDINATION AND SELECTIVITY STUDY

- A. NA.

1.10 SCHEDULING

- A. **General.** It is mandatory that the facility be maintained in operation during construction and that periods of shutdown due to "line changeovers," etc. are held to a minimum. These outages must be scheduled with and have the concurrence of the Engineer/Architect and the Owner. Further, it is mandatory that the completion of various stages of the electrical work coincide with the other phases of construction to maintain present and permit operation of new installations as construction progresses.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Rough-In

1. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
2. Refer to equipment specifications specified elsewhere for rough-in requirements.

B. Electrical Installations

1. General. Sequence, coordinate, and integrate the various elements of electrical systems, materials, and equipment. Comply with the following requirements:
 - a. Coordinate electrical systems, equipment, and materials installation with other building components.
 - b. Verify all dimensions by field measurements.
 - c. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for electrical installations.
 - d. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete or supported from or on other structural components, as they are constructed.
 - e. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the work. Give particular attention to large equipment requiring positioning prior to closing in the building and equipment which must be placed in service before further construction can take place.
 - f. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
 - g. Coordinate connection of electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service and place each in proper operating order.
 - h. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer

conflict to the Engineer/Architect before final placement.

- i. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed.
- j. Install electrical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
- k. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

3.2 CUTTING AND PATCHING

A. **General.** In addition to the requirements specified in Divisions 1 and 31, the following requirements apply:

- 1. Perform cutting, fitting, and patching of electrical equipment and materials required to:
 - a. Uncover work to provide for installation of ill-timed work.
 - b. Remove and replace defective work.
 - c. Remove and replace work not conforming to requirements of the Contract Documents.
 - d. Remove samples of installed work as specified for testing.
 - e. Install equipment and materials in existing structures.
 - f. Upon written instructions from the Engineer/Architect, uncover and restore work to provide for the Engineer/Architect observation of concealed work.
- 2. Cut, remove, and legally dispose of selected electrical equipment, components, and materials as indicated, including but not limited to removal of electrical items indicated to be removed and items made obsolete by the new work.
- 3. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.
- 4. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.
- 5. Protection of Installed work. During cutting and patching operations, protect adjacent installations.
- 6. Patch existing finished surfaces and building components using new

materials matching existing materials. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

7. Patch finished surfaces and building components using new materials specified for the original installation. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

3.3 ELECTRICAL DEMOLITION

A. Existing Conduit Location

1. In existing structures at this project, there is electrical conduit embedded in concrete. It shall be the responsibility of the Contractor, under this Section, to attempt to locate and mark the existence of any conduit embedded in areas where, as part of this Contract, the concrete is to be drilled or cut into for any purpose.

B. Removal and Relocation of Existing Electrical Apparatus

1. The Contractor, under this section, shall remove and store or relocate all existing electrical apparatus as shown on the drawings, as specified herein, or as necessary for the completion of this Contract except where specifically called for to be included under another section of the Contract.
2. Where existing electrical equipment, including lighting fixtures, are shown to be removed, the Contractor shall also remove the existing branch wiring.
 - a. Wiring removal shall extend to the branch disconnect or to the next piece of utilization equipment.
 - b. Where new or existing equipment is to be reinstalled, the wiring may be temporarily terminated.
3. Where part of the existing equipment on a branch circuit is to be disconnected, the circuit shall be de-energized only long enough to disconnect the equipment and terminate the wiring that is to remain.
4. All equipment and major lengths of wiring retired and removed shall remain the property of the Owner unless shown or directed otherwise and shall be placed in storage on the site by the Contractor where ordered.
5. When pumps, motors, or other apparatus are being removed under other sections of this Contract, all electrical wiring, conduit, boxes, and related equipment shall be completely removed under this Division 16.
6. Removal of all equipment shall include the removal of all accessories incidental to the major units. Where wiring is removed from conduit and boxes, the accessible conduit and boxes shall also be removed.

7. When the Contract is complete, no piece of electrical equipment shall remain installed that is not in service unless otherwise ordered.
8. Where electrical conduit, boxes, or appurtenances are embedded in walls or slabs, and wires, wiring devices, fixtures, or other apparatus is removed from these embedded items, the conduits shall be cut off flush with the surface and plugged with masonry to a smooth surface and the boxes and other appurtenances covered with suitable approved stainless steel cover plates. The cover plates shall have stainless steel fasteners.
9. Electrical equipment or components, supported by materials or equipment being removed under this or other Divisions in this Contract, shall be temporarily supported during the demolition process and then properly and permanently re-supported prior to the conclusion of this Contract. All supports shall meet all the applicable requirements of this Division.
10. Any electrical equipment or components damaged during the performance of this Contract shall be replaced or repaired to a like new condition in accordance with the requirements of this Division.

3.4 CLEANING

- A. **General.** When all work is completed and has been tested and accepted by the Engineer/Architect, the Contractor shall clean all light fixtures, equipment, and exposed surfaces that have been directly affected by this work. The Contractor, insofar as the work is concerned, shall at all times keep the premises in a neat and orderly condition and at the completion of the work shall properly clean up and remove from the site any excess materials.

END OF SECTION

SECTION 31 11 00

CLEARING AND GRUBBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** This section includes the clearing and grubbing of the work site and the following:
1. Clearing of area.
 2. Grubbing of stumps and roots.
 3. Removal of all other vegetation.
 4. Protection of designated trees.
 5. Removing above- and below grade structures.
 6. Disposal off-site of all material generated by the clearing and grubbing operations.

1.3 QUALITY ASSURANCE

Not used.

1.4 SUBMITTALS

Not used.

1.5 JOB CONDITIONS

- A. **Infrastructure Interference.** Conduct site clearing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction.
- B. **Protection.** Provide protection necessary to prevent damage to existing improvements.
- C. **Restoration.** Restore all disturbed improvements to their original condition.

1.6 DELIVERY, STORAGE, AND HANDLING

Not used.

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. **Site Verification of Conditions.** The Contractor shall verify in the presence of the Engineer/Architect the specific areas and limits requiring clearing and grubbing. Also review any trees, shrubs, or other items which are not to be disturbed.
- B. **Coordination.** The Contractor shall review with Engineer/Architect or other Owner's Representative requirements of surrounding areas such as adjacent property owners, roads, streets, walks, or other occupied or used facilities. Evidence of proper permission for activities from authorities having jurisdiction shall be given the Engineer/Architect.

3.2 PREPARATION

- A. **Safety.** Provide protection as required for surrounding area and operation of any adjoining or affected utilities.
- B. **Permits.** Obtain all required permits prior to beginning operations.

3.3 **LANDSCAPE REMOVAL.** Remove trees, shrubs, grass and other vegetation, improvements, or obstructions as required to permit installation of new construction. Remove similar items elsewhere on site or premises as specifically indicated. "Removal" includes grubbing and off-site disposing of stumps and roots. Grubbing shall be carried to a depth of 18 inches below existing ground.

3.4 **PROTECTION OF EXISTING TREES AND VEGETATION.** Protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking, or skinning of roots; skinning or bruising of bark; and smothering of trees by stockpiling construction materials or excavated materials. Provide temporary guards to protect trees and vegetation to remain standing.

3.5 **SALVAGEABLE IMPROVEMENTS.** Carefully remove items indicated to be salvaged, and store on Owner's premises where indicated.

3.6 **BURNING.** The Contractor shall obtain prior approval from Owner and appropriate authorities before any burning will be permitted.

3.7 **DISPOSAL.** All trees, shrubs, plants, and other materials removed shall become the property of the Contractor and shall be removed from the site.

END OF SECTION

SECTION 31 23 00

EXCAVATION, BACKFILL, AND EMBANKMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** Complete the excavation, backfill, and embankment necessary to construct the work as shown and specified herein. This section includes the following where applicable: structures, underground utilities, and preparing subgrade for pavements, walks, or slabs.
- B. **Other Work.** Final grading together with placement and preparation of topsoil for lawns and planting is specified in Section 32 90 02, "Grading and Seeding." Excavation and backfill for buried piping are covered in Division 33.
- C. **Definitions**
 - 1. Excavation. The removal of material to required subgrade elevations and disposal of excavated materials.
 - 2. Backfill. Below grade placement and compaction of specified materials to required elevations.
 - 3. Unauthorized Excavation. The removal of materials beyond required subgrade elevations or dimensions without specific direction.
 - 4. Subgrade. The undisturbed earth or the compacted soil layer immediately below foundations, pipe trenches, mud mats, pavement, slabs, walks, base, compacted foundation, embankment, or as shown.
 - 5. Embankment. An engineered fill constructed of compacted, suitable earthen materials used to raise grade to the required elevations.

1.3 QUALITY ASSURANCE

- A. **Codes and Regulatory Agencies.** Perform excavation work in compliance with all federal, state, and local codes and regulatory agencies.
 - 1. OSHA - Occupational Safety and Health Administration.
 - a. OSHA 29 Code of Federal Regulations (CFR) Part 1926.650 to .652, Subpart P. Construction Standard for Excavations.
- B. **Standards.** Conform all work and materials to the following standards.
 - 1. ASTM – American Society for Testing and Materials.
 - 2. ODOT – Ohio Department of Transportation.

1.4 SUBMITTALS

A. General

1. All submittals shall be in accordance with the Section 01 33 00 “Submittals” and this specification section. Do not deliver or install any materials before Submittal Packages 1 and 2 are approved.

B. Submittal Package No. 1 – Product Data and Test Laboratory Qualifications

1. Submit product data and laboratory qualifications for review and approval. Submittal package shall include:
 - a. Product Data. Submit material data, noting each material source, location, sieve analysis, and other information which will show that the source and supplier are capable of furnishing materials meeting the requirements of these specifications. Submit name and location of all borrow pits.
 - b. Test Laboratory. Submit name and address of acceptable test laboratory including the name and experience of the Engineer assigned to the field testing.

C. Submittal Package No. 2 – Samples

1. Samples shall include:
 - a. Aggregate. Submit samples not less than 1/4 cubic foot each for the following:
 - 1) Granular backfill.
 - 2) Porous backfill.
 - 3) Base.
 - 4) Drainage Base.
 - b. Filter Fabric. One foot square section.

D. Submittal Package No. 3 – Field Test Reports

1. Submit test reports within 48 hours of completion, suspension, or termination of testing the material including the following:
 - a. Tests. Submit a copy of each test report called for in this section.

1.5 JOB CONDITIONS

A. Utilities

1. Existing Utilities.
 - a. Notify utility companies and locate existing underground utilities in area of work.

- b. Where utilities are to remain in place, provide adequate means of support and protection during construction operations.
 - c. Repair any Contractor-damaged utilities to the owner's satisfaction at the Contractor's expense.
2. Unforeseen Utility Location.
- a. Should a utility which is encountered during excavation be unrecorded or recorded incorrectly, consult the utility immediately for directions.
 - b. Cooperate with the utility or Owner in keeping respective services or facilities in operation.
 - c. Repair damaged utilities to the satisfaction of the utility owner.
3. Interruption.
- a. Do not disrupt existing utilities except when approved.
 - b. Provide acceptable temporary utility services unless approved otherwise.
4. Notification. Provide a minimum of 48 hours notice to utility companies and Owner or Engineer/Architect before excavating or interrupting utilities.

B. **Blasting.** Do not blast.

D. **Borrow.** Should the excavated material be insufficient to provide all of the fill required, supply satisfactory material from another source at no cost to the Owner.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Topsoil

- 1. Remove, stockpile, and place in the areas to be seeded topsoil that is available as a part of the excavated materials.
- 2. Shape stockpile and grade to drain.

B. Excavated Material

- 1. Storage Stockpile. Stockpile excavated material when suitable for use as backfill or embankments onsite as directed.

C. Stockpiles

- 1. Shape and grade stockpile. Handle the material so that the gradation remains uniform and foreign material is not incorporated into the mix.

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.1 MATERIALS

A. **General.** All materials shall be free of elastic soil materials, debris, waste, frozen material, vegetation, organics, peats, or other deleterious material.

B. **Backfill and Embankment**

1. Soil.

- a. Earth materials which have resulted from natural processes such as weathering, decay, and chemical action.
- b. More than 35 percent weight of the grains or particles will pass a No. 200 sieve and have a plastic index of 4 or more.
- c. Free of aggregate or rock larger than 2 inches in any dimension.

2. Aggregate Material.

- a. Natural mineral aggregate such as gravel, crushed gravel, crushed rock, or sand.
- b. At least 65 percent by weight of the grains or particles will be retained on a No. 200 sieve.
- c. At least 90 percent by weight of the grains or particles shall pass the 3-inch sieve.
- d. Remove rock pieces larger than 6 inches in any dimension.

3. Shale. Finely stratified, laminated material formed by consolidation in nature, mudstone, claystone, siltstone, and clay bedrock. Break into predominantly fine particles which can be readily tested for compaction requirements as soil.

4. Rock. Sandstone, limestone, dolomite, glacial boulders, and old concrete which are crushed into pieces that can readily be incorporated into a specified lift thickness and compacted according to requirements for granular materials.

C. **Granular Backfill.** Granular backfill shall be crushed or uncrushed granular material meeting the following grading requirements:

Sieve	Total Percent Passing
2-1/2 inch	100
1 inch	70 – 100
No. 4 (3/16 inch)	25 – 100
No. 40	10 – 50
No. 200	5 – 15

The fraction passing a No. 40 sieve shall have a liquid limit not greater than 30 and a plasticity index not greater than 6.

- D. **Porous Backfill.** Porous backfill shall be granular material meeting the requirements of ASTM D 448, No. 57, 67, or 78 size.
- E. **Mud Mat.** Unless shown or directed otherwise, all mud mats shall be concrete.
 - 1. Concrete. A concrete mud mat shall consist of a 3-inch layer of Class C concrete.
 - 2. Granular Material. A granular mud mat shall consist of a 4-inch layer of crushed aggregate meeting the requirements of porous backfill.
- F. **Base.** Base shall be crushed granular material meeting the following grading requirements.

Sieve	Total Percent Passing
2 inch	100
1 inch	70 – 100
3/4 inch	50 – 90
No. 4	30 – 60
No. 30	9 – 33
No. 200	0 – 15

- G. **Drainage Base.** Drainage base shall be crushed granular material meeting the requirements of ASTM D 448 No. 57, 67, or 78 size.
- H. **Filter Fabric.** Furnish Type D filter fabric unless shown otherwise. The fabric shall be composed of strong, rotproof, polymeric fibers formed into a woven or nonwoven fabric conforming to the following requirements.

Type A: Underdrains and Slope Drains		
Minimum Tensile Strength	ASTM D 4632	80 lb (335 N)
Minimum Puncture Strength	ASTM D 4833	25 lb (110 N)
Minimum Tear Strength	ASTM D 4533	25 lb (110 N)
Apparent Opening Size	ASTM D 4751	
Soil Type 1: Soils with 50% or less passing No. 200 (75µm) sieve		AOS ≤0.6 mm
Soil Type 2: Soils with 50 to 85% passing No. 200 (75 µm) sieve		AOS ≤0.3 mm
Minimum Permeability	ASTM D 4491	1x10 ⁻² cm/sec
Type B: Filter Blankets for Rock Channel Protection		
Minimum Tensile Strength	ASTM D 4632	200 lb (890 N)
Minimum Puncture Strength	ASTM D 4833	80 lb (355 N)
Minimum Tear Strength	ASTM D 4533	50 lb (220 N)
Minimum Elongation	ASTM D 4632	15%
Apparent Opening Size	ASTM D 4751	AOS ≤0.6 mm
Minimum Permeability	ASTM D 4491	1x10 ⁻³ cm/sec
Type C: Sediment Fences		
Minimum Tensile Strength	ASTM D 4632	120 lb (535 N)
Maximum Elongation at 60 lb (265 N)	ASTM D 4632	50%
Minimum Puncture Strength	ASTM D 4833	50 lb (220 N)
Minimum Tear Strength	ASTM D 4533	40 lb (180 N)
Apparent Opening Size	ASTM D 4751	AOS ≤0.84 mm
Minimum Permittivity	ASTM D 4491	1x10 ⁻² sec ⁻¹
Ultraviolet Exposure Strength Retention	ASTM D 4355	70%
Type D: Subgrade-Base Separation or Stabilization		
Minimum Tensile Strength	ASTM D 4632	180 lb (800 N)
Maximum Elongation at 170 lb (755 N)	ASTM D 4632	35%
Minimum Tear Strength	ASTM D 4533	70 lb (310 N)
Minimum Puncture Strength	ASTM D 4833	70 lb (310 N)
Apparent Opening Size	ASTM D 4751	Same as Type A
Permeability	ASTM D 4491	1x10 ⁻³ cm/sec
Type E: Pavement Reinforcement Fabric		
AASHTO M 288, Section 9, Table 7		

All minimum strengths shown are average roll minimum values in the weakest principal direction.

Ensure that the fabric is free of any treatment that might significantly alter its physical properties. During shipment and storage, wrap the fabric in a heavy-duty protective covering to protect it from direct sunlight, dirt, dust, and other debris.

I. Filter Fabric Securing Pins

1. 3/16-inch minimum diameter.
2. Steel.
3. Pointed at one end.

4. Fabricated with a head to retain a steel washer having an outside diameter not less than 1-1/2 inches.
5. At least 18 inches long.

J. **Topsoil.** In accordance with Section 32 90 02, "Grading and Seeding."

PART 3 - EXECUTION

3.1 EXAMINATION

A. **Site Verification.** Verify actual field/site conditions and confirm grades, elevation, and other pertinent information before beginning excavation.

3.2 PREPARATION

A. Notifications

1. Notify all utilities and adjacent owners of structures or pavements of the excavation.
2. Notify owners of adjoining properties or utilities in case of emergencies.

3.3 EXCAVATION

A. **Topsoil.** Remove topsoil and place in separate stockpile.

B. Protection

1. Excavations. Protect all excavations by bracing, sheeting, piling, slope benching, or other acceptable means in accordance with OSHA 29 CFR Part 1926.650 to .652, Subpart P. Be responsible for protection of the excavation at all times.
2. Existing Structures. Protect existing structures, utilities, sidewalks, pavements, and other facilities from damages caused by settlement, lateral movement, undermining, washout, and other hazards created by construction operations including dewatering operations.
3. Barricade open excavations.

C. Drainage

1. Direct surface water away from excavations to prevent erosion and undermining of foundations.
2. Provide and maintain diversion ditches, dikes, and grading as necessary during construction.
3. Protect excavated slopes and backfill surfaces to prevent erosion and sloughing.
4. Perform excavation so that the site and the area immediately surrounding the site and affecting operations at the site shall be continually and effectively drained.

D. Dewatering

1. Control groundwater flowing toward or into excavations to prevent sloughing of excavation slopes and walls, boils, uplift, and heave in the excavation.
2. Do not use French drains, sumps, ditches, or trenches within 3 feet of the foundation of any structure unless authorized.
3. Take control measures by the time the excavation reaches the groundwater level in order to maintain the integrity of the in situ material.
4. While the excavation is open, maintain the water level a sufficient distance below the working level to provide a stable working surface.

E. Rock Excavation

1. Definition.
 - a. Rock excavation is defined as the removal of:
 - 1) Unanticipated solid concrete (excluding pavements), unanticipated solid masonry, or boulders each of which has a volume greater than 1 cubic yard.
 - 2) Bedrock which requires for its removal drilling and blasting, wedging, sledging, barring, or breaking up with a power-operated tool.
 - b. Rock excavation is not excavating:
 - 1) Existing concrete or masonry structures or pavements shown.
 - 2) Material which can be excavated using an appropriately sized, heavy-duty, power-operated excavator, backhoe, or shovel, all of which are equipped with bucket-mounted ripping teeth.
 - 3) Material that can be excavated with a hand pick and shovel.
 - 4) Soft or disintegrated bedrock such as weathered shale, clay shale, claystone, or mudstone, or overconsolidated soils such as "hardpan."
 - 5) Previously blasted materials or materials that are intermittently drilled and blasted to merely increase production.
2. Blasting. Do not blast unless approved.
3. Limits. Unless otherwise noted, excavate rock to the bottom of structures and to a minimum clear width of 6 inches around the outer limits of the structures.

- F. **Disposal.** Dispose of all excavated material unless otherwise shown.
1. Excavated material which is satisfactory may be used for backfill and embankments.
 2. Dispose of excavated material which is unsatisfactory or surplus off-site.
- G. **Excavation for Structures**
1. Elevations and Dimensions. Conform to required elevations and dimensions within a tolerance of 0.10 foot, and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and inspection.
 - a. Excavations for Footings and Foundations.
 - 1) Do not disturb bottom of excavation.
 - 2) Excavate by hand to final grade just before concrete reinforcement is placed.
 - 3) Trim bottoms to required lines and grades to leave solid base to receive other work.
 - b. Excavations for Pile Foundations.
 - 1) Stop excavations from 6 inches to 12 inches above bottom of pile cap before piles are placed.
 - 2) After piles have been driven, remove loose and displaced material.
 - 3) Excavate to final grade, leaving solid base to receive concrete pile caps.
- H. **Excavation for Pavements.** Excavate under pavements to comply with required cross sections, elevations, and grades.

3.4 SUBGRADE

- A. **Freeze Protection.** Protect the following from freezing:
1. Excavation bottoms or material on which foundations will be constructed.
 2. Constructed foundations.
 3. Subgrades.
- B. **Disturbed Subgrade.** Using an approved method, remediate disturbed subgrade caused by inundation or inadequate dewatering procedures. Perform these remedial measures at no cost to the Owner.
- C. **Mud Mat.** Provide a mud mat as shown or where site conditions require a mud mat to protect subgrade.

- D. **Unauthorized Excavation.** Backfill unauthorized excavation below design elevations with Class C concrete or other approved material at no cost to the Owner.
- E. **Unsuitable Bearing Materials.** Remove unsuitable bearing materials encountered at design elevations and replace with a suitable bearing material as directed.
- F. **Shape the subgrade** at all foundations, slabs, and pavements so that the required thickness of the foundations, slabs, pavements, and granular material can be maintained.
- G. **Pavement and Slab Subgrade**
 - 1. Compact all pavement and slab subgrades to a depth of 12 inches.
 - 2. Replace subgrade soils with a maximum dry density of less than 100 pounds per cubic foot under pavement and slabs with suitable soil or granular material.
 - 3. Compact soil subgrades with a maximum dry density of 100 to 105 pounds per cubic foot to at least 102 percent.
 - 4. Compact all other soil subgrades to at least 100 percent.
 - 5. The moisture content shall be between the optimum moisture content and 3 percent above the optimum moisture content.

3.5 PROOFROLLING

A. General

- 1. Unless directed otherwise, proofroll all subgrades for pavements, slabs, and embankments.
- 2. Remove debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to proofrolling and placement of fill for embankment.
- 3. The proofrolling equipment shall consist of an acceptable pneumatic-tired vehicle such as a loaded dump truck.
- 4. The gross load of the vehicle shall be at least 25 tons.
- 5. Roll the entire plan area of the subgrade with at least two passes of the vehicle or as directed.
- 6. Adjacent passes shall be offset no more than 6 inches to provide complete coverage of the area.
- 7. Remove and replace any soft, wet, or weak areas detected by the proofrolling with acceptable material or scarify, moisture-condition, and recompact.

3.6 FILTER FABRIC

A. General

- 1. Surfaces to receive fabric shall be relatively smooth and free of obstructions and debris.
- 2. Place the fabric loosely without wrinkles and creases.

3. Where joints are necessary, place strips to provide a 12-inch minimum overlap.
4. Place securing pins with washers at 2-foot intervals along joints and at 5-foot intervals elsewhere to prevent slippage of the fabric.

3.7 BACKFILL AND EMBANKMENTS

A. General

1. Place and compact backfill material as shown and specified in this section.
2. Adjacent to structures:
 - a. Use backfill where it will support landscaping.
 - b. Use granular backfill where it will support structures and slabs.
3. Backfill excavations as promptly as work permits, but not until completion of the following:
 - a. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
 - b. Inspection, testing, approval, and recording locations of underground utilities have been performed and recorded.
 - c. Removal of concrete formwork.
 - d. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.
 - e. Removal of trash and debris from excavation.
 - f. Permanent or temporary horizontal bracing is in place on horizontally supported walls.
 - g. After the first floor slab has been poured and set on building walls, unless otherwise approved.
 - h. Testing water-bearing walls for watertightness.

B. Placement

1. Backfill against other work shall be in a manner and at such time as not to endanger the stability or damage the work.
2. Do not place any lift on surfaces that are muddy or frozen, or contain frost or ice.
3. Place backfill and fill materials evenly around structures, piping, or conduit to required elevations.
4. Place granular materials after the subgrades have been leveled.

5. Unless noted otherwise, all references to degree of compaction are expressed as a percentage of the maximum dry density in accordance with ASTM D 698 (standard Proctor).
6. Before compaction, moisten or aerate each lift as necessary to provide appropriate moisture content.
7. Place and compact materials in lifts as specified in the following paragraph.
 - a. Backfill.
 - 1) Maximum 6-inch loose layers unless using hand tampers.
 - 2) Maximum 4-inch loose layers when hand-operated tampers are used.
 - 3) Compact each layer to at least 95 percent unless noted otherwise.
 - 4) Compact backfill for voids, depressions, or holes resulting from the demolition of existing structures to 100 percent.
 - 5) Moisture content between 1 percent below optimum and 3 percent above optimum.
 - b. Granular Backfill.
 - 1) Maximum 6-inch loose layers unless using hand tampers.
 - 2) Maximum 4-inch loose layers when hand operated tampers are used.
 - 3) Compact each layer to at least 100 percent.
 - 4) Moisture content at or near optimum.
 - c. Base.
 - 1) Maximum 6-inch compacted layers.
 - 2) When shown as more than 6 inches thick, place material in equal layers but no layer more than 6 inches compacted thickness.
 - 3) When supporting a structure or slab, compact each layer to at least 100 percent.
 - 4) In all other situations, compact each layer to at least 98 percent.
 - 5) Moisture content within 1 percent of the optimum.
 - d. Porous Backfill.
 - 1) Maximum 6-inch compacted layers.
 - 2) Compact each layer to at least 95 percent unless supporting a structure if supporting a structure, compact to 100 percent.

- e. Granular Mud Mat.
 - 1) Compact at least 100 percent.
 - f. Drainage Base.
 - 1) Maximum 6-inch compacted layers.
 - 2) When shown as more than 6 inches thick, place material in equal layers but no layer more than 6-inch compacted thickness.
 - 3) Compact each layer to at least 100 percent.
8. Moisture Conditioning.
- 1) Where the subgrade or a lift of soil material must be moisture conditioned before compaction, uniformly apply water to surface.
 - 2) Apply water sparingly to prevent free water from appearing on surface during or subsequent to compaction operations.

C. Grading

- 1. Smooth the finished surface within specified tolerances.
- 2. Grade and compact areas with uniform slopes between required elevations or between such points and existing grades.
- 3. Grade areas to drain away from structures and to prevent ponding.
- 4. Finish surfaces free from irregular surface changes and as follows:
 - a. Lawn or Unpaved Areas. Grade areas to receive topsoil to within not more than 0.10 foot above or below required subgrade elevations.
 - b. Pavements and Walks. Shape surface of areas under pavement to line, grade, and cross section, with surface not more than 1/2 inch above or below required subgrade elevation.

D. Embankments

- 1. Continuously bench sloped surfaces steeper than 1 vertical to 8 horizontal so that embankment material will bond with existing surface.
- 2. Maximum 6-inch loose layers.

3. Compact each layer to the minimum percent of maximum dry density specified herein.

Compaction Maximum Dry Density lbs/cf	Minimum Percent Maximum Dry Density
90-104.9	102
105-119.9	100
120 and more	98*

*100 if embankment supports a structure foundation.

4. Moisture Content.
 - a. The moisture content shall be between the optimum moisture content and 3 percent above the optimum moisture content.
 - b. For material which displays pronounced elasticity or deformation under action of compaction equipment, reduce the moisture content to optimum to secure stability.

3.8 FIELD QUALITY CONTROL

A. Field-Testing

1. Test Laboratory. The contractor shall employ an acceptable soils testing laboratory to determine the following:
 - a. Moisture density relationship of the materials to be compacted.
 - b. Field moisture and density to verify the degree of compaction being obtained.
 - c. The strength of subgrades supporting structures.
2. The soils testing laboratory personnel shall be on-site **continuously** during all placement and compaction activities including backfills and embankments to determine compliance with this specification section.
3. Tests will be located by the Engineer/Architect.
4. Allow testing services to inspect and approve subgrades, backfill, drainage fill, and embankment layers before further construction work is performed.
5. Perform field density tests as follows, in accordance with ASTM D 1556 or D 2922. Perform footing subgrade strength tests using acceptable calibrated instruments.
 - a. Footing Subgrade. Conduct at least one test to verify required design bearing for each footing location. For a strip footing, conduct one test for every 50 linear feet of footing.
 - b. Building Slab or Paved Areas. Make at least one field density subgrade test for every 2,000 square feet, but in no case less than three.

- c. Backfill, Base, Drainage Base, and Embankment. Field density tests shall be made at least once for every 50 cubic yards, or fraction thereof, and at least one test per lift (compacted layer).
 - d. Wall Backfill. Take at least one field density test, per side, at locations directed for each lift (compacted layer).
- 6. If the subgrade, backfill, drainage fill, or embankment is below specified density, provide additional compaction and testing at no additional cost to the Owner.
- B. **Settling.** Where settling is measurable or observable during the general project warranty period, remove the surface (pavement, lawn, or other finish), add backfill, compact, and replace surface at no cost to the Owner.

3.9 GRADING FOR SEEDING

- A. **Rough Grading**
 - 1. Trim and grade all areas to within 4 inches of the finished grades.
 - 2. These areas are to be free from rock or other foreign material 3 inches or greater in any dimension.
- B. **Finished Grading.** Spread topsoil to conform to the required finished grades.

END OF SECTION

SECTION 31 23 23.14

TRENCH GRANULAR BACKFILL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **General.** The Contractor shall provide the labor, tools, equipment, and materials necessary to furnish and place the trench granular backfill in accordance with the plans and as specified herein.

1.3 QUALITY ASSURANCE

- A. **Codes and Standards.** Perform all work required to furnish and place the granular backfill in compliance with applicable requirements of governing agencies having jurisdiction and in accordance with these plans and as specified herein.

1.4 SUBMITTALS

- A. **Transmittals.** Furnish manufacturer's product data, test reports, and materials certifications as required.

1.5 JOB CONDITIONS

Not used.

1.6 DELIVERY, STORAGE, AND HANDLING

Not used.

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. **Granular Backfill.** Granular backfill material shall be gravel, crushed gravel, or crushed stone meeting the following grading requirements:

Sieve	Total Percent Passing
2-1/2	100
1 inch	70-100
No. 4 (3/16 inch)	25-100
No. 40	10-50
No. 200	5-15

The fraction passing a No. 40 sieve shall have a liquid limit not greater than 30 and a plasticity index not greater than 6.

- B. **Backfill.** Backfill around polyvinyl chloride (PVC) water line pipe shall not exceed a maximum size of 100 percent passing the 1-1/2 inch screen.
- C. **Trench-Excavated Granular Material.** Excavated granular material meeting the material specification and as approved by the Engineer/Architect may be used as granular backfill.

PART 3 - EXECUTION

- 3.1 **INSTALLATION.** General. Place material in layers to required elevations for each area classification listed below, using materials specified in Part 2 of this section.
 - 1. Under walks and pavements, use base material, backfill, or a combination.
 - 2. Adjacent to structures, use backfill material.
 - 3. Under piping, conduit, and equipment, use base materials where required over rock bearing surface and for correction of unauthorized excavation. Shape excavation bottom to fit bottom 90 degrees of cylinder. From bottom of piping and conduit to 12 inches above piping and conduit, use fill except 100 percent of aggregate should pass 1-inch sieve.
 - 4. Backfill excavations as promptly as work permits, but not until completion of the following:
 - a. Inspection, testing, approval, and recording locations of underground utilities have been performed and recorded. Backfill trenches when authorized by Engineer/Architect.
 - b. Removal of shoring and bracing, and backfilling of voids with satisfactory materials.
 - c. Removal of trash and debris from excavation.
- B. **Placement.** No material shall be placed until such work has been observed by the Engineer/Architect and approved. No material shall be placed over snow or frozen material.
 - 1. Place materials specified in Part 2 in lifts as specified below. Before compaction, moisten or aerate each lift as necessary to provide appropriate moisture content. Compact each lift to required percentage

of maximum dry density for each area classification. Do not place any lift on surfaces that are muddy or frozen, or contain frost or ice.

2. Place backfill and fill materials evenly adjacent to piping, or conduit to required elevations. Use care in backfilling of trenches to avoid damage or displacement of piping and conduits.
3. Control all compaction and provide minimum percentage of density specified for each area classification indicated below. Correct improperly compacted areas or lifts of soils if soil density tests indicate inadequate compaction.
4. Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances; compact with uniform levels or slopes between points where elevations are indicated or between such points and existing grades.
5. Grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes and as follows:
 - a. Lawn or Unpaved Areas. Grade areas to receive topsoil to within not more than 0.10 foot above or below required subgrade elevations.
 - b. Walks. Shape surface of areas under walks to line, grade, and cross section, with surface not more than 0.05 foot above or below required subgrade elevation.
 - c. Pavements. Shape surface of areas under pavement to line, grade, and cross section, with surface not more than 1/2 inch above or below required subgrade elevation.
6. Placement. Type of granular material shall be placed where shown on the drawings and as specified.

C. Compaction

1. Each layer shall be compacted to not less than 95 percent of maximum dry density. The moisture content shall be not greater than 1 percentage point below optimum moisture content and not greater than 3 percentage points above optimum moisture content.
2. Granular Backfill. Granular backfill shall be placed in not more than 6 inch loose layers, 4 inch loose layers when hand operated tampers are used, and each layer compacted to not less than 100 percent of maximum dry density. The moisture content shall be at or near optimum moisture content.

3.2 FIELD QUALITY CONTROL

A. Testing

1. Allow testing services to inspect and approve backfill, and fill layers before further construction work is performed.
2. Perform field density or strength tests as follows, in accordance with American Society for Testing and Materials (ASTM) D 698, D 1556, and D 2922.
 - a. Building Slab or Paved Areas. Make at least one field density test of subgrade for every 2,000 square feet, but in no case less than three.
 - b. Backfill and Drainage Base. Field density tests shall be made at least once for every 250 cubic yards, or fraction thereof, of compacted material.
3. If the specified compacted materials are found to be below specified density, provide additional compaction and testing at no additional cost to the Owner.
4. Settling. Where settling is measurable or observable during the general project warranty period, remove the surface (pavement, or other finish), add backfill, compact, and replace surface at no cost to the Owner.

END OF SECTION

SECTION 31 23 23.23

COMPACTED FOUNDATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to the work specified in this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** Provide the labor, tools, equipment, and materials necessary to install the compacted foundation in accordance with the drawings and specifications.

1.3 QUALITY ASSURANCE

- A. **Codes and Regulatory Agencies.** Perform excavation work in compliance with all federal, State, local codes, and regulatory agencies.
 - 1. OSHA – Occupational Safety and Health Administration.
 - a. OSHA 29 Code of Federal Regulations (CFR) Part 1926.650 to .652, Subpart P. Construction Standard for Excavations.
- B. **Standards.** Conform all work and materials to the following standards.
 - 1. ASTM – American Society for Testing and Materials.

1.4 SUBMITTALS

A. General

- 1. Submit all submittals in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.

B. Submittal Package No. 1 – Product Data

- 1. Product Data. Submit material source name and location, sieve analysis, and other information which will show that the source and supplier are capable of furnishing the specified materials.
- 2. Samples. Submit a 1/4-cubic-foot sample of each type of compacted foundation material to be used.
- 3. Laboratory. Submit name and address of laboratory including the name and experience of the Engineer assigned to do field testing.

C. Submittal Package No. 2 – Test Reports

- 1. Tests. Submit two copies of each test report called for in this section.

1.5 JOB CONDITIONS

A. **Cooperation.** Cooperate with the soils testing laboratory and provide access to the site for testing.

B. Compacted Foundations Subgrade Preparation

1. All material shall be place on compacted subgrade prepared in accordance with Specification 02 31 23 00 Excavation, Backfill, and Embankment, in accordance with the requirements that meet ODOT Item 204 Compacted Backfill. Soils tests shall be completed by independent soils testing firm retained by the Contractor, and sampled prior to placement of compacted foundation materials.
2. Coarse Aggregate Placement on Compacted Subgrades. Where excavations that have been completed to the elevation or grade of the proposed subgrade, cannot be compacted to meet requirements of Specification 02 31 23 00 Excavation, Backfill, and Embankment, the defective materials will be removed and replaced with compacted Foundation Cushion the comply with the requirements of Section 31 23 23.23 as directed and approved by the Owner and Engineer.
3. Compacted Foundation Materials under Lagoon Concrete Slabs, Structures, and Manholes. The Contractor will place compacted foundation material to the elevations and grades shown on the plans at the thicknesses shown on the plans that conform to Paragraph 2.1 B Granular Material. All compacted granular materials shall be compacted graded, and tested, and a written report issued to the Engineer that the materials are suitable and ready to support proposed foundations, slabs, and structures.

1.6 DELIVERY, STORAGE, AND HANDLING

A. **General.** In accordance with Section 01 60 00, "Materials and Equipment."

1. Stockpile material in designated areas.
2. Avoid segregation.
3. Do not contaminate stockpiled material with foreign materials.

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.1 MATERIAL

A. **Coarse Aggregate.** Coarse aggregate shall consist of No. 1 or No. 2 size coarse aggregate such as gravel or crushed rock and meet the following grading:

Sieve	Total Percent Passing – No. 1	Total Percent Passing – No. 2
4 inch	100	--
3-1/2 inch	90 – 100	--
3 inch	--	100
2-1/2 inch	25 – 60	90 – 100
2 inch	--	35 – 70

1-1/2 inch	0 – 15	0 – 15
1 inch	--	--
3/4 inch	0 – 5	0 – 5
No. 4 (3/16 inch)	--	--
No. 30	--	--
No. 200	--	--

- B. **Granular Material.** Granular material shall consist of crushed granular material, such as crushed gravel or crushed rock, and meet the following grading:

Sieve	Total Percent Passing Granular Material
2 inch	100
1 inch	70 – 100
3/4 inch	50 – 90
No. 4	30 – 60
No. 30	9 – 33
No. 200	0 – 15

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site Verification of Conditions

1. Commence removal of existing material below the foundation subgrade after it has been designated to be removed, unless shown otherwise by the drawings.

3.2 INSTALLATION

A. Coarse Aggregate

1. The use of coarse aggregate must be authorized before it can be used on the project.
2. Coarse aggregate may be used when dewatering and site groundwater conditions are restricted and water remains in the excavated area to receive compacted foundation.
3. Place coarse aggregate in loose layers 8 inches to 12 inches in depth.
4. Thoroughly track in place by crawler-type tractors.
5. Place the coarse aggregate in a maximum of 1 foot of water and carry to a maximum of 1 foot above the level of the water.

B. Granular Material

1. Place granular material in the dry and above any coarse aggregate.
2. Granular Material.

- a. Place granular material in 6-inch loose layers with each layer compacted to a minimum of 100 percent of maximum dry density.
- b. The moisture content shall be at or near optimum.
- c. Accomplish compaction with acceptable equipment.

3.3 FIELD QUALITY CONTROL

A. General

1. Employ an acceptable testing laboratory to determine the following:
 - a. The moisture density relationship of the material to be compacted in accordance with ASTM D 698.
 - b. The degree of compaction obtained in accordance with ASTM D 1556 or D 2922.
 - c. The strength of structure subgrades.
2. The soils testing laboratory personnel shall be on-site during all placement and compaction activities involving compacted foundation to determine compliance with this specification section.
3. Test every 50 cubic yards or fraction thereof, or at least once per layer for each area of compacted granular material.
4. Test locations will be selected by the Engineer/Architect.

END OF SECTION

SECTION 32 10 01.01

PAVEMENT AND WALKS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** Provide the labor, tools, equipment, and materials necessary to construct the pavement and walks in accordance with plans and as specified herein.

1.3 QUALITY ASSURANCE

- A. **Codes and Regulatory Agencies.** Perform all work in compliance with all applicable federal, state, and local codes and regulatory agencies.
- B. **Standards.** Material and work shall be in conformance with:
 - 1. ODOT - Ohio Department of Transportation.
- C. **Testing Laboratory.** Engage an acceptable testing laboratory to perform subgrade inspection and compaction tests.

1.4 SUBMITTALS

A. General

- 1. Submit all submittals in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.

B. Submittal Package No. 1 – Product Data

- 1. Product Data. Submit manufacturer's data on all material.
- 2. Certification. Submit in writing certification that all materials and mixes are in conformance with specifications.
- 3. Test Data. Submit test data as required under paragraph 3.2 B.1.

1.5 JOB CONDITIONS

A. Coordination

- 1. Coordinate all pavement installation with proper authorities.
- 2. Coordinate pavement installation with other work of contract such that there is minimum disruption of the completed pavement and/or delays of other work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. **Delivery.** Comply with ODOT Item 401.11 hauling requirements.
- B. **Storage.** Comply with ODOT Item 106.05.
- C. **Handling.** Comply with ODOT Item 106.06.

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.1 MATERIAL

- A. **General.** All material shall be in accordance with the 2013 release of the ODOT "Construction and Material Specifications"
- B. **Bases**
 - 1. **Aggregate.** Aggregate base shall be in accordance with ODOT Item 304. Do not use slag.
 - 2. **Asphalt Concrete.** Asphalt concrete base shall meet the specifications of ODOT Item 301.
- C. **Prime Coat.** Prime coat shall be in accordance with ODOT Item 408. Materials shall conform to the applicable requirements of 702 for the asphalt material and use one of the following types: 702.02 RC-70, RC-250, MC-30, MC-70, or MC-250; or 702.03 Primer 20.
- D. **Tack Coat.** Tack coat shall be in accordance with ODOT Item 407. Materials shall conform to the applicable requirements of 702 for the asphalt material and use one of the following types: 702.04 RS-1, SS-1, SS-1h, CRS-1, CSS-1, CSS-1h; or 702.13.
- E. **Asphalt Concrete**
 - 1. **Surface Course.** Asphalt concrete surface course shall be in accordance with ODOT Items 441, 446, and/or 448 and as indicated on the plans. The surface course type shall be as indicated on the plans.
 - 2. **Intermediate Course.** Asphalt concrete intermediate course shall be in accordance with ODOT Items 441, 446, and/or 448 and as indicated on the plans. The intermediate course type shall be as indicated on the plans.
- F. **Concrete with Portland Cement.** Concrete shall be in accordance with Section 03 30 00, "Cast-in-Place Concrete," Class A or ODOT Item 452.
- G. **Expansion Joint.** Expansion joints shall be 1/2-inch-thick preformed, non-extruding type.
- H. **Parking Bumpers.** Parking bumpers shall be precast concrete, standard curb type, and predrilled for anchoring.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions

1. Verify that subgrade is at proper elevation and slope where required.
2. Verify that moisture will not interfere with compaction.

3.2 PREPARATION

A. Topsoil. Remove topsoil. See Section 32 90 02, "Grading and Seeding."

B. Subgrade

1. See Sections 31 23 00, "Excavation, Backfill, and Embankments," for compaction requirements.
2. Remove all loose and foreign materials.
3. Place base material when the subgrade is free of ruts and standing water.

C. Slope

1. Slope pavement to drain away from buildings and structures.
2. Driveways in open areas shall have a center crown.
3. Cross slope for driveways and walks shall be 3/16 inch per foot unless otherwise shown.

D. Existing Pavement

1. Conform pavement to the grade of existing pavements or walks unless noted otherwise.
2. Where it is necessary to disturb existing Portland cement concrete pavements or walks, saw-cut in neat, straight lines a minimum depth of 2 inches.
3. Where it is necessary to disturb existing asphalt concrete pavement or walks, saw-cut the asphalt concrete with straight vertical edges. Seal all cut bituminous surfaces with a bituminous material.

E. Arrange for inspection and testing as work progresses.

3.3 PAVEMENT

A. General. All construction shall be in accordance with ODOT "Construction and Material Specifications."

B. Asphalt Pavement

1. Aggregate Base. Aggregate base shall consist of compacted aggregate applied in layers of equal thickness to a depth shown on the plans in accordance with Item 304.04. Maximum lift thickness shall be 8 inches when vibratory rollers greater than 12 tons are used, 6 inches when vibratory rollers between 10 and 12 tons are used, and 4 inches when vibratory rollers are not used. Compaction shall be in accordance with ODOT Item 304.05.
2. Prime Coat. Apply according to ODOT Item 408 at the rate of 0.40 gallon per square yard.
3. Install asphalt concrete base in two layers each 3 inches thick after compaction.
4. Wearing Surface. Unless otherwise shown, wearing surface shall consist of 3 inches of asphalt concrete applied in two layers. The surface course shall be 1-1/4 inches thick after compaction. The intermediate course shall be 1-3/4 inches thick after compaction.
5. Install asphalt concrete base and asphalt pavement in accordance with ODOT Items 301, 441, 446 or 448 surface course, and 446 or 448 intermediate course. The surface course type and intermediate course type shall be as indicated on the plans.

C. Gravel Pavement

1. Gravel pavement shall consist of an 8 inch course of compacted aggregate base applied in two layers, each 4 inches thick after compaction.
2. Place in accordance with ODOT Item 304.04.
3. Compact in accordance with ODOT Item 304.05.

D. Resurfacing

1. Surface Preparation. Place no material until the existing surface areas have been examined and all holes, broken edges, cracks, and damaged areas have been repaired.
2. Tack Coat. Apply according to ODOT Item 407 at the rate of 0.15 gallon per square yard.
3. Wearing Surfaces. Resurface existing areas shown on the plans with a minimum of 2 inches of ODOT Item 448 asphalt concrete after compaction.

E. Temporary Pavement

1. Temporary pavement is limited for use as temporary patches in existing streets, drives, and walks.
2. Temporary pavement shall be the asphalt concrete surface course specified in this section.
3. The surface on which the temporary pavement is to be placed shall be cleaned and maintained free of materials that would contaminate the mixture or preclude proper placement.
4. All temporary pavement shall be a minimum of 2 inches thick unless noted otherwise.

5. Conform pavement to the grade of the existing street, drive, or walk.

3.4 ASPHALT WALKS

- A. **Asphalt Concrete Walks.** Construct as specified for asphalt concrete pavement, except aggregate base shall be 4 inches thick and the wearing surface meeting ODOT Item 441 shall be a minimum of 2 inches thick.

3.5 CONCRETE WALKS

- A. **Concrete Walks.** Concrete walks shall be 4 inches thick, except on driveways which will be 6 inches set on a 4-inch compacted aggregate base.
- B. **Finish.** Float-finish concrete with a tooled joint every 4 feet and an expansion joint every 20 feet.

3.6 GRAVEL WALKWAYS

- A. **Gravel Walks.** Gravel pavement shall consist of an 4 inch course of compacted aggregate base applied in a single layers over geotextile membrane 6 mils in thickness. Geotextile membrane shall be minimum 6 mils in thickness and installed after compaction of subbase to cover the entire walkway, shoulder, or non-grassed area as shown or called for on the plans. Complete coverage of the areas is intended to extend to cover limits of gravel areas up to the edges of roadways, curbs, and a minimum of 12-inches beyond any fence lines.
 1. Place in accordance with ODOT Item 304.04.
 2. Compact in accordance with ODOT Item 304.05. Soft materials and protruding boulders be removed prior to leveling and compaction.
 - 3.. Geotextile membrane shall be in conformance with ODOT Item 441 shall be layed to overlap edges a minimum of 6 inches and pinned onto compacted subgrade to prevent movement during gravel placement.

3.7 FIELD QUALITY CONTROL

- A. **Spreading and Surface Tolerances.** The variation of the aggregate surface shall be in accordance with ODOT 301, 304, and 401 after compaction.
- B. **Compaction.** In addition to requirements of ODOT 301, 304, 401, and 441, test the aggregate by proof-rolling with vehicle loads equal to or exceeding 80,000 pounds per four axles or 20,000 pounds per single axle.
- C. **Tolerance of Completed Surface.** The variation of the completed surface courses shall not exceed the requirements of ODOT 401.16.

END OF SECTION

SECTION 32 31 13

CHAIN-LINK FENCES

PART 1 - GENERAL

- 1.1 **RELATED DOCUMENTS.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.
- 1.2 **DESCRIPTION OF WORK.** Provide the labor, tools, equipment, and materials necessary to construct the chain-link fence in accordance with the drawings and the specifications.
- 1.3 **QUALITY ASSURANCE**
- A. **Standards.** Conform materials and workmanship with the following standards referenced herein:
1. ASTM - American Society for Testing and Materials.
- B. **Source.** Provide chain-link fence as complete units controlled by a single source including necessary erection accessories, fittings, and fasteners.
- 1.4 **SUBMITTALS.** Submit all submittals in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.
- A. **Submittal Package No. 1 – Shop Drawings and Product Data**
1. Product Data. Manufacturer's specifications and published data including all information required to substantiate that materials comply with the specifications.
 2. Shop Drawings showing size, gauge, weight, and finish of all materials, method of anchorage, hardware, and plan layout. Include a list of materials and product warranty.
 3. Warranty. Written warranty called for in paragraph 1.7 of this section.
 4. Samples.
 - a. A 1-foot-square section of fence fabric.
 - b. A 1-foot-long section of post and rail.
 - c. A 1-foot-long sample of the barbed wire.
- 1.5 **JOB CONDITIONS** (Not used)
- 1.6 **DELIVERY, STORAGE, AND HANDLING.** In accordance with Section 01 60 00, "Materials and Equipment."

- 1.7 **SPECIAL WARRANTY.** The manufacturer shall provide a 15-year warranty against rust and corrosion of the fence.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Fabric

1. The fence fabric shall be galvanized steel wire, 2-inch mesh chain-link.
 - a. 6 feet high and over shall have the selvage edges twisted and barbed.
 - b. 5 feet high and under shall be over knuckled at the top and twisted and barbed at the bottom.
2. Wire.
 - a. Commercial quality
 - b. Medium high carbon 9 gauge steel wire
 - c. Hot dipped galvanized
 - d. Minimum tensile strength of 100,000 pounds per square inch (psi).
3. Galvanizing. After fabrication, hot-dip-galvanize fabric in accordance with ASTM A 392 or ASTM A 817 Class 2.

B. Framing

1. Galvanizing.
 - a. All steel framing parts inside and outside.
 - b. In accordance with ASTM F 1083.
 - c. Minimum of 1.8 ounces per square foot of the total coated surface.
2. Post and rail specific requirements. Dimensions listed are inside diameters.
 - a. Top Rail.
 - 1) 1-1/4-inch Schedule 40 at 2.27 pounds per foot or SS-40 at 1.83 pounds per foot.
 - 2) Provide means of attaching securely to each gate, cover, and post and adjacent line post.
 - b. Bottom Rail. 1-1/4-inch Schedule 40 at 2.27 pounds per foot or SS-40 at 1.83 pounds per foot.
 - c. Tension Wire. 6-gauge, galvanized, high-carbon steel coil spring wire.

- d. Line Posts. Line posts shall be C-Section as stated in Table 710.03-1, ODOT Construction Specification Manual. End/Corner posts shall be Grade 1 pipe.
 - e. Terminal and Straining Posts. 2-1/2 inch Schedule 40 at 5.79 pounds per foot or SS-40 at 4.64 pounds per foot.
 - f. Post Brace. 1-1/4-inch Schedule 40 at 2.27 pounds per foot or SS-40 at 1.83 pounds per foot.
 - g. Truss Rod. 3/8-inch steel rod complete with turnbuckle.
- C. **Barbed Wire.** Fit fence posts with galvanized barbed wire arms for carrying three strands of barbed wire at a 45-degree angle. Barbed wire shall be maximum-security type of two-strand 12-gauge wires with four-point aluminum barbs, 5 inches apart.
- D. **Hardware**
- 1. Fence shall come complete with all necessary hardware, fittings, and accessories such as tension bars, tension bands, brace bands, end clamps, nuts, and bolts.
 - 2. Galvanize all hardware.
- E. **Concrete.** Concrete for setting posts in the ground shall be Design Mix Class A in accordance with Section 03 30 53, "Cast-in-Place Concrete."

PART 3 – EXECUTION

3.1 EXAMINATION

A. Site Verification of Conditions

- 1. Verify that site conditions are satisfactory for a successful fence installation.
- 2. Correct any unsatisfactory conditions before installation.
- 3. Notify Engineer/Architect of any conditions that cannot be corrected.
- 4. Confirm final locations and property lines.

- 3.2 **PREPARATION.** Perform clearing and grubbing to construct the fence to the required alignment. Grade to provide a reasonably smooth ground profile at the fence line.

3.3 INSTALLATION

A. Posts

- 1. Ground Installation. Place posts at least 34 inches below finished grade. Encase posts in concrete a minimum of 36 inches below finished grade with 6 inches around the post and a 1-inch crown.

2. **Concrete Installation.** Place posts in concrete slabs, walls, or floors in preformed holes, minimum 8 inches deep with the inside diameter 1 inch greater than the outside diameter of the post. Fill the annular space with nonshrink grout and crown to 1 inch at post.
3. **Spacing.** Install line posts at maximum 10-foot centers.
4. Install all posts vertically straight.

B. Fabric

1. Erect the fabric a minimum of 7 days after setting the posts in concrete.
2. Fasten the fabric to the line posts with clips or bands spaced at approximately 14 inches apart and to the top and bottom rails with bands or tie wires at approximately 24- inch intervals.
3. Fasten the fabric to terminal posts using a tension bar with tension bands spaced 12 inches apart.
4. Fabric shall be rigid and taut.

C. Horizontal Deflection. At points of deflection where the fence changes alignment by more than 5 degrees, provide a post brace and truss rod in each fence panel adjacent to the post located at the angle point.

D. Post Braces. Support each gate, straining, and terminal post with a post brace and truss rod. Extend the brace from the line post back to the gate, straining, or terminal post.

E. Bottom Rail or Tension Wire. When a bottom rail is not shown, reinforce the bottom of the fabric by a tension wire stretched through the fabric and tied to the posts with the fabric.

F. Barbed Wire. Pull and anchor three strands of barbed wire to the arms. Alternate location of barbs in each strand a maximum of 2-1/2 inches on center in alternate layers.

3.4 DEMONSTRATION

A. Visual. Verify that all fencing has been installed in accordance with the Contract Documents by walking the entire fence line and showing the Owner and/or Engineer/Architect that:

1. All corner posts are braced.
2. All posts are set in concrete with 1-inch crown.
3. Fabric is tight and properly anchored.

END OF SECTION

SECTION 32 90 02

GRADING AND SEEDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** Provide the grading and seeding as shown and specified herein.

1.3 QUALITY ASSURANCE

A. Certificate of Inspection

1. Ship all seeds with a certificate of inspection in accordance with the governing authorities.
2. Label all bags of seed and fertilizer with legible waterproof tags or directly on the bag.

1.4 SUBMITTALS

A. General

1. Submit all submittals in accordance with the Division 1 Submittal Requirements and this specification section.

B. Submittal Package No. 1 – Product Data and Certified Statement

1. Submit seed vendor's certified statement for each grass seed mixture required that includes:
 - a. Botanical and common name.
 - b. Percentage by weight.
 - c. Percentages of purity, germination, and weed seed for each grass seed species.
2. Product Data. Submit information on all materials included in this specification.

1.5 JOB CONDITIONS

- A. **General.** Proceed with grading and seeding as soon as portions of the site become available, working within seasonal limitations and the seed manufacturer's recommended limitations regarding weather conditions and temperatures.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery

1. Deliver seed only when site conditions are ready.
2. Deliver materials in unopened containers showing weight, mixture analysis, package date, and manufacturer.

B. Storage and Handling

1. Store and cover material to prevent wetting and deterioration.
2. Remove packages from the site that have become wet, moldy, or damaged, or show water marks.

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.1 MATERIAL

A. Topsoil. Topsoil shall contain:

1. A maximum of 40 percent clay in that portion passing a No. 10 sieve.
2. Between 5 and 20 percent organic matter as determined by loss on ignition of samples oven-dried at 212 degrees Fahrenheit (° F.) to a constant weight.

B. Fertilizer. Fertilizer shall contain the specified percentages of total nitrogen, available phosphoric acid, and water soluble potash. The weight, name of plant nutrients, and guaranteed percentages shall be marked on the sealed fertilizer containers.

1. 12-12-12. This fertilizer shall be used with Seed Mixes 1, 2, 3, and 5.
2. 5-10-10. This fertilizer shall be used with Seed Mix 4 (Crownvetch).

C. Inoculant. Treat Seed Mix 4 (Crownvetch) with inoculant culture of nitrogen fixing bacteria less than 1 year old.

D. Seed. Percentages are by weight.

	Minimum Germination	Minimum Purity
1. Seed Mix 1		
40% Kentucky Bluegrass (<i>Pos pratensis</i>)	75%	85%
40% Creeping Red Fescue (<i>Festuca rubra</i>)	85%	98%
20% Annual Ryegrass (<i>Lolium multiflorum</i>)	85%	95%

		Minimum Germination	Minimum Purity
2.	Seed Mix 2 30% Kentucky Bluegrass (<i>Poa pratensis</i>) 50% Kentucky 31 Fescue (<i>Festuca arundinacea</i> var. Ky. 31) 20% Annual Ryegrass (<i>Lolium multiflorum</i>)	75% 85% 85%	85% 95% 95%
3.	Seed Mix 3 90% Perennial Ryegrass (<i>Lolium perenne</i>) 10% Alsike Clover (<i>Trifolium hybridum</i>)	85% 85%*	95% 98%
4.	Seed Mix 4 (Crownvetch) 30% Crownvetch (<i>Coronilla varia</i>) 30% Kentucky 31 Fescue (<i>Festuca arundinacea</i> var. Ky. 31) 30% (Pennlawn) Red Fescue (<i>Festuca rubra</i>) 10% Annual Ryegrass (<i>Lolium multiflorum</i>)	70%* 85% 85% 85%	99% 95% 98% 95%
5.	Seed Mix 5 80% Kentucky Bluegrass (<i>Poa pratensis</i>) 20% Annual Ryegrass (<i>Lolium multiflorum</i>)	75% 85%	85% 95%

*Germination includes a total of quick germination plus hard seeds.

E. Mulch

1. Straw. Straw mulch shall be baled wheat or oat straw free of weed seed, sticks, or other foreign material.
2. Wood Cellulose Fiber. Dye the wood cellulose fiber mulch green.

F. Asphalt Emulsion. Do not use asphalt emulsions.

G. Mow Strip Blocks

1. Install concrete mow strips as shown and specified herein. Mow strips shall be precast concrete. Provide two anchor pins for each block. Field-cut blocks to achieve necessary radii.
2. Description.
 - a. Height. 6 inches.
 - b. Width. 8 inches.

- c. Length. 8 feet.
- d. Securing Holes. 7/8-inch diameter.
- e. Anchor Pins. No. 6 reinforcement bar, galvanized, 16 inches long.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. **Verification.** Verify that final grades and elevations have been achieved in all areas. Remove all exposed debris and stones larger than 3/4 inch in any dimension from seeded areas.

3.2 PREPARATION

- A. **Soil Tests.** Test soil as necessary to ensure acceptable seeding conditions.

3.3 SEEDING

- A. **Seed Mix.** Seed all privately owned lawns with Seed Mix 5. On all privately owned cultivated fields, place the seedbed but do not seed. Seed all other disturbed areas with Seed Mix 1, unless otherwise noted.

B. Preparation of Seedbed

- 1. Remove, stockpile, and use for seedbed topsoil that is available as part of the excavated material.
- 2. Remove all grass, weeds, roots, sticks, stones, and other debris and finish the seedbed with careful hand raking.
- 3. If there is a deficiency of topsoil as part of the excavated materials, provide topsoil from another source at no cost to the Owner.
- 4. The seedbed shall be a minimum of 4 inches of topsoil.
- 5. Prepare a smooth seedbed before seeding.

- C. **Dry Seeding.** When a seed mix is sown dry, apply the materials as follows:

- 1. Fertilizing.
 - a. Apply fertilizer uniformly to all areas to be seeded at the rate of 10 pounds per 1,000 square feet.
 - b. Disk, harrow, or rake the fertilizer into the seedbed to a depth of 2 inches.
- 2. Seeding. Mix thoroughly and sow uniformly the seed over the prepared areas. After sowing, rake, drag, or otherwise treat the area to cover the seed with soil to a depth of 1/4 inch.
 - a. Seed Mixes 1, 2, 3, and 5. Sow these seed mixes at a rate of 3 pounds per 1,000 square feet.
 - b. Seed Mix 4 (Crownvetch). Sow this seed mix at a rate of 2 pounds per 1,000 square feet. Before sowing, inoculate it in accordance with manufacturer's directions. Sow this seed mix only from November through August.

3. Water. Water the seeded areas at the completion of the sowing and weekly thereafter until accepted by the Owner.
4. Mulching.
 - a. Place straw mulching material evenly over all seeded areas within 48 hours of seeding at a rate of 2 tons per acre between March 15 and October 15 and at a rate of 3 tons per acre between October 16 and March 14.
 - b. Secure straw mulching material by approved methods.
 - c. When mulching is displaced, replace it and reseed the area; repair other work damaged as a result of mulch displacement.

D. Hydraulic Seeding

1. When seed is applied hydraulically, use a combined slurry of fertilizer, inoculant when required, seed, and wood cellulose fiber mulch in one operation.
2. Increase the inoculant for Seed Mix 4 (Crownvetch) to five times the manufacturer's recommended rate for dry seeding.
3. Mix wood cellulose fiber at a rate of 1,500 pounds per acre.
4. Mix fertilizer and seed at the rate specified for dry seeding.

3.4 MAINTENANCE

- A. **General.** Maintain seeded areas. Fill, grade, and reseed settled and eroded areas. Seeding will not be accepted unless it is alive and healthy.

3.5 DEMONSTRATION

- A. **Seeded Area.** Before final acceptance the seeded area shall have:
1. A minimum of 100 grass plants per square foot and less than 2 percent bare spots over the entire area.
 2. No individual bare spots larger than 6 square inches

END OF SECTION

SECTION 33 05 13

MANHOLES AND INLETS

PART 1 - GENERAL

- 1.1 **RELATED DOCUMENTS.** Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to this section.
- 1.2 **DESCRIPTION OF WORK.** Provide the labor, tools, equipment, and materials necessary to furnish and install the manholes and inlets in accordance with the drawings and specifications.
- 1.3 **QUALITY ASSURANCE** (Not used)
- 1.4 **SUBMITTALS.** Submit all submittals in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.
 - A. **Submittal Package No. 1 – Shop Drawings and Product Data**
 1. Product Data. Furnish samples, manufacturer's product data, test reports, and materials certifications as required.
 2. Shop Drawings. Provide detail drawings, sketches, and specifications as may be required to establish that the proposed manholes and inlets conform to the requirements of the plans and specifications.
- 1.5 **JOB CONDITIONS** (Not used)
- 1.6 **DELIVERY, STORAGE, AND HANDLING.** In accordance with Section 01 60 00, "Materials and Equipment."
- 1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

- 2.1 **MANHOLES AND INLETS**
 - A. **Sanitary Sewer Manholes.** Provide watertight manholes constructed only of cast-in-place concrete or precast concrete sections.
 - B. **Storm Sewer Manholes and Inlets.** Provide storm sewer manholes and inlets constructed of cast-in-place concrete, precast concrete, brick, or concrete block.
 - C. **Concrete.** Provide Class A, 4,000-pound-per-square-inch (psi), 28-day-strength portland cement concrete as specified in Section 03 30 00, "Cast-in-Place Concrete," in the construction of manholes and inlets.
 - D. **Concrete Reinforcement.** Provide reinforcement as shown and as specified in Section 03 30 00, "Cast-in-Place Concrete," in the construction of manholes and inlets.

E. Precast Reinforced Concrete Manhole Sections

1. Manhole sections shall conform to the requirements of American Society for Testing and Materials (ASTM) C 478, except that the minimum wall thickness shall be equal to the requirements of ASTM C 76 Wall B.
 - a. Provide flat top manhole lid where shown on plans.
2. Additional Requirements for Sanitary Sewer Manholes Only.
 - a. Form joints of the manhole sections entirely of concrete employing a round rubber gasket conforming to ASTM C 443, and when assembled, shall be self-centering and make a uniform watertight joint.
 - b. If provided, make lift holes watertight.
3. Provide aluminum single or double leaf Access Doors as indicated on the drawings. Access doors shall be as shown on the plans and shall be capable of supporting an H-20 wheel load. The access doors shall be aluminum with stainless steel hardware. Frame shall be drainable type with upper rail bracket, chain hook, and cable holder. They shall have a frost proof lock with Tee-wrench access which can be opened from the inside without a key. A wind catch shall be provided to keep the covers from coming shut under normal load. Access doors shall be Bilco Type JD-AL H-20 or equal. Access doors shall be furnished with safety grates.

F. Connections

1. The sewer pipe to manhole connections on all sanitary sewers shall be flexible and watertight.
 - a. To maintain flexibility in the connection, leave a 1-inch space between the end of the pipe inside the manhole and the concrete channel; fill this space with a waterproof flexible joint filler.
 - b. The watertight connection shall meet the following requirements.
 - 1) Any metal or hardware that is used shall be Type 300 series stainless steel.
 - 2) Elastomers must be EPDM or isoprene.
 - 3) Comply with ASTM C 923.
2. Do not extend the sewer pipe barrel at the springline more than 1 inch beyond the inside face of the manhole.
3. All stub connections shall be pipe with the same joint, strength, and specification as the sewer pipe. Plug and block the stub with an approved stopper compatible with the sewer pipe joint.

G. Manhole Steps

1. Manhole steps shall conform to the requirements of ASTM C 478, American Association of State Highway Transportation Officials (AASHTO) M-199, and as shown.
2. Each manhole step shall consist of a 1/2-inch Grade 60 deformed reinforcing bar encapsulated in polypropylene.
 - a. The polypropylene shall conform to ASTM D 4101.
 - b. The reinforcing bar shall conform to ASTM A-615.
3. Do not exceed 24 inches between the top of casting and the first step.

H. Grade Adjustment

1. Provide precast reinforced concrete manhole sections, if used, in any combination to obtain the desired depth.
2. Construct manholes in such a manner that the total depth from invert to top of casting will allow a minimum of three adjusting rings or three brick courses below the top of casting.
3. All joints shall be smooth and completely filled with mortar.
4. Adjusting rings shall be one of the following:
 - a. Precast concrete adjusting rings conforming to ASTM C 478.
 - b. Expanded Polypropylene as manufactured by Cretex Specialty products or equal.

I. Frames and Covers for Manholes

1. Manhole frames and covers shall be gray iron castings of the heavy duty pattern as shown.
2. The cover and seat shall have machined bearing surfaces to prevent rocking and rattling.
3. Cast the words "SANITARY SEWER" or "STORM SEWER" as appropriate on all covers.
4. Provide vented covers except in pavement and where shown otherwise.
5. Where shown as "bolted" or "watertight," the manhole frames and covers shall be of the heavy-duty watertight type with gasket seal and bolted lid. Anchor frame to manhole with four 7/8" x 9" long stainless steel anchor bolts.
6. All covers shall have a concealed pick hole.
7. Do not provide more than two consecutive manholes with solid covers.
8. Provide solid covers for structures in pavement.

- J. Drop Manhole Connections.** Provide drop manhole connections for sanitary sewers when shown or as directed. Pipe and fittings shall be with the same joint, strength, and specification as the sewer pipe.

K. **Precast Reinforced Concrete Manhole Tees.** For sewers 48 inches in diameter and larger, precast concrete manhole tees may be used in lieu of concrete manhole bases when shown.

L. **Mortar**

1. Mortar shall be portland cement and sand mixed in the proportions of one bag of cement to 2 cubic feet of sand.
2. Measure the sand loose in a bucket or in some other suitable measure of known volume.
3. Mix the dry cement and sand thoroughly and uniformly first. Then wet with water to make a stiff paste which will be plastic under the trowel, but not so soft as to run after being placed.
4. Use the mortar before it has begun to stiffen.
5. Do not remix and use mortar that has set.

M. **Masonry**

1. All masonry joints shall be smooth and completely filled with mortar.
2. Brick shall conform to Grade MS as specified in ASTM C 32.
3. Concrete brick may be used on approval, providing they meet all of the requirements specified in ASTM C 139.
4. Solid concrete block shall conform to Grade N-1 as specified in ASTM C 145.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. **Foundation.** When a precast concrete manhole base is used, provide drainage base according to Section 31 23 00, "Excavation, Backfill, and Embankment." for the base foundation. The pad shall extend a minimum of 4 inches beyond the outside wall of the manhole base and shall be 6 inches thick within a 1-inch tolerance.
- B. **Cold Weather.** If the work is carried on in cold weather, provide the necessary means for heating concrete, brick, and mortar and for complying with all the requirements of the Engineer/Architect to thoroughly protect the masonry and concrete work during and after construction from damage by frost. Do not perform any masonry or backfilling during days, in the opinion of the Engineer, that are unsuitable for good workmanship.
- C. **Completion.** All sewers, manholes, and inlets, upon their completion, are to be clean and free from rubbish until the acceptance of the work. Repairs or alterations made to the manholes after performing the leakage test may be justification for a retest of the section of sewer involved; see Section 01 89 19 for the leakage test.
- D. **Inverts.** Where there are changes in the direction of the sewer or entering branches to the manhole or inlet, the centerline of the invert shall have a true curve of as large a radius as the size of the manhole or inlet will permit.

- E. **Concrete and Mortar Placement.** Place no mortar or concrete in water, and don't allow water to flow over or against the concrete or mortar before it has set for a period of time deemed sufficient to prevent damage to the structure.

END OF SECTION

SECTION 33 05 30

PRESSURE PIPE, FITTINGS AND VALVES, INSTALLATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** Provide the labor, tools, equipment, and materials necessary to install the pipe and fittings in accordance with the drawings and as specified herein. The work includes, but is not limited to, the following:
1. Excavation, preparation of the trench bottom and bedding.
 2. Shoring and bracing.
 3. Piping beginning at the outside face of structures or building foundations, unless specifically included under other sections.
 4. Piping beneath structures.
 5. Installation of supports, restraints, and thrust blocks.
 6. Work on existing buried pipelines.
 7. Installation of all joints, fittings, specials, couplings, adapters, sleeves, tie rods, jointing and gasketing materials, and all other work required to complete the piping installation.
 8. Valves, gates, and specials shown or specified for the piping systems.
 9. Testing and disinfection.
 10. Cleaning.
 11. Trench maintenance.

1.3 QUALITY ASSURANCE

- A. **Standards.** Conform all materials and workmanship with the following standards.
1. AASHTO – American Association of State Highway and Transportation Officials.
 2. Ohio EPA – Environmental Protection Agency.
 3. ANSI – American National Standards Institute.
 4. ASTM – American Society for Testing and Materials.
 5. AWWA – American Water Works Association.
 6. PPI – Plastic Pipe Institute.
- B. **Trench Maintenance.** Be responsible for the condition of the trenches for a minimum period of one year from the date of the final acceptance, which must include the period of November 1 to the following April 30. Extend the contract bond to cover the entire trench maintenance period.

1.4 SUBMITTALS

A. General

1. Submit all submittals in accordance with the Division 1 Submittal Requirements and this specification section.

B. Submittal Package No. 1 – Backfill Product Data

1. Submit product data for review and approval. Submittal package shall include:
 - a. Product Data. Submit material data, noting each material source, location, sieve analysis, and other information which will show that the source and supplier are capable of furnishing materials meeting the requirements of these specifications. Submit name and location of all borrow pits. Product data is required for the following:
 - 1) Granular pipe bedding.
 - 2) Granular backfill.

1.5 JOB CONDITIONS

- A. **Testing.** Provide all water required for testing at no additional cost to the Owner. Do not pressure-test polyvinyl chloride (PVC) and polyethylene (PE) pipe when the temperature of the pipe is over 80 degrees Fahrenheit (° F.).
- B. **Cleaning.** Provide all water required for cleaning and flushing at no additional cost to the Owner.

1.6 DELIVERY, STORAGE, AND HANDLING

A. General

1. Delivery, storage, and handling shall be in accordance with Section 01 60 00, "Materials and Equipment."
2. Pipe, fittings, and accessories that are cracked, damaged, or in poor condition, or have damaged linings will be rejected.
3. Pipe handled on skidways shall not be skidded or rolled against other pipe.
4. Protect PVC or PE pipe from exposure to heat or direct sunlight (ultraviolet rays).

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.1 GENERAL

- A. **Pipe and Fittings.** Conform all buried piping, fittings, and joints to the drawings and requirements specified in the corresponding section for each type of pipe installed.
- B. **Manufacturer**
1. All new buried piping of one material shall be by a single manufacturer.
 2. All buried fittings of one material shall be by a single manufacturer.
 3. All pipe and fittings manufactured outside the United States shall be certified to ISO 9001:2000 standards for quality assurance.
- C. **Identification**
1. Paint or cast all pipe and fittings 4 inches in diameter and larger with the pipe size, material, and class or schedule on the exterior pipe surface.
 2. Factory-mark all piping less than 4 inches in diameter with the pipe size, material, and class or schedule on the exterior pipe surface.

2.2 BACKFILL

- A. **Granular Pipe Bedding.** Crushed stone or gravel meeting the following requirements:

Nominal Pipe Size	AASHTO M43 Size
Less than 16 "	7, 78, 8, or 89
Greater than 16"	6, 67, or 68

- B. **Selected Excavated Trench Material**
1. Free from cinders, refuse, organic material, boulders, rocks, frozen material, or other material which in the opinion of the Engineer is unsuitable.
- C. **Excavated Trench Material**
1. Free from frozen earth, debris, or earth with an exceptionally high void content.

- D. **Granular Backfill.** Granular backfill materials shall be gravel, crushed gravel, crushed stone, or sand meeting the following grading requirements:

Sieve	Total Percent Passing
2-1/2 inch	100
1 inch	70 – 100
No. 4 (3/16 inch)	25 – 100
No. 40	10 – 50
No. 200	5 – 15

The fraction passing a No. 40 sieve shall have a liquid limit not greater than 30 and a plasticity index not greater than 6.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions

1. Verify the location and elevation of required construction.
2. Confirm that conditions are acceptable to begin construction of the work covered in the specification.
3. Coordinate with other construction or activities in the same facility or area.

3.2 PREPARATION

- A. **Safety.** For the security and safety of persons in and adjacent to trenches or construction operations, follow the safety regulations of the appropriate federal, state, and local agency.

B. Dewatering

1. Should water be encountered, furnish and operate suitable pumping equipment of adequate capacity to dewater the trench.
2. Sufficiently dewater the trench so that the laying and joining of the pipe is in the dry.
3. Convey all trench water in accordance with the requirements contained in the National Pollutant Discharge Elimination System (NPDES) program.
4. Convey all trench water to a natural drainage channel or storm sewer without causing any property damage.

- C. **Construction Equipment.** Where mains are located in or adjacent to pavements, all backfilling and materials handling equipment shall have rubber tires. Use crawler equipment only where there is no danger of damaging pavement.

- D. **Noise, Dust, and Odor Control.** Conduct construction activities so as to eliminate all unnecessary noise, dust, and odors. Do not use oil or other materials for dust control which may cause tracking.

3.3 INSTALLATION

A. **Protection of Trees**

1. Take special care to avoid damage to trees and their root systems.
2. Do not use machine excavation when, in the opinion of the Engineer, it would endanger the tree.
3. Where the line of trench falls within the limits of the limb spread, headers are required across the trench to protect the tree.
4. Conduct the operation of all equipment (particularly when employing booms), the storage of materials, and the deposition of excavation in a manner which will not injure trees, trunks, branches, or their roots unless such trees are designated for removal.

B. **Excavation and Construction Materials.**

1. Place all excavated material and all construction materials used in the work so as not to endanger the work, annoy the public, or interfere with natural drainage courses.
2. During the process of the work, maintain all material piles in a neat, workmanlike manner.

C. **Trench Support**

1. Unsupported open cut trenches will not be permitted where they may cause unnecessary damage to pavement, trees, structures, poles, utilities, or other private or public property.
2. During the progress of the work, support the sides of the excavation by adequate and suitable sheeting, shoring, bracing, or other approved means.
3. Remove trench support material and equipment when backfilling operations have progressed to the point where they may be withdrawn without endangering property.
4. In lieu of removing all the sheeting, you may cut off the sheeting 2 feet above the top of the pipe and remove the upper portion.
5. If all the sheeting is to be removed, remove it without causing damage to the pipe.
6. No sheeting, shoring, or bracing will be paid for by the Owner unless remaining in place on written order of the Engineer. In this case, payment will be made in accordance with the General Conditions.

D. Trench Excavation and Bottom Preparation

1. Trench Width. Hold widths of trenches to a minimum to accommodate the pipe and appurtenances. Measure the trench width at the top of the pipe barrel and shall conform to the following limits:

a. Pipe.

Earth

Minimum	Outside diameter of the pipe barrel plus 8 inches, i.e., 4 inches each side
Maximum	Nominal pipe diameter plus 24 inches

Rock

	Nominal Pipe Diameter 24 inches or less	Nominal Pipe Diameter Larger than 24 inches
Minimum	Outside diameter of the pipe barrel plus 12 inches, i.e., 6 inches each side	Outside diameter of the pipe barrel plus 18 inches, i.e., 9 inches each side
Maximum	Nominal pipe diameter plus 24 inches	Nominal pipe diameter plus 24 inches

b. Structures. The minimum excavation limits for structures shall be as excavated. In rock, the excavation limits shall not exceed 12 inches from the outside wall and 6 inches below the footer.

c. Excessive Trench Width. If for any reason the trench width exceeds the maximum trench width defined in this section, provide granular pipe bedding, additional strength pipe, or concrete encasement, at no cost to the Owner and subject to acceptance.

2. Trench Depth.

a. Earth.

- 1) Excavate the trench to the depth required.
- 2) Provide a uniform and continuous bearing and support for the pipe barrel on solid and undisturbed ground at every point between joints.
- 3) It will be permissible to disturb the finished trench bottom over a maximum length of 18 inches near the middle of each length of pipe for the withdrawal of lifting tackle.
- 4) Provide bell holes.
- 5) Accurately prepare the finished trench bottom by means of hand tools.

- b. Rock.
 - 1) Where excavation is made in rock or boulders, excavate the trench 6 inches below the pipe barrel for pipe 24 inches in diameter or less, and 9 inches for pipe larger than 24 inches in diameter.
 - 2) Remove all loose material from the trench bottom.
- 3. Rock Excavation.
 - a. Rock excavation is defined as the removal of:
 - 1) Unanticipated solid concrete (excluding pavements), unanticipated solid masonry, or boulders each of which has a volume greater than 1 cubic yard.
 - 2) Bedrock which requires for its removal drilling and blasting, wedging, sledging, barring, or breaking up with a power-operated tool.
 - b. Rock excavation is not excavating:
 - 1) Existing concrete or masonry structures or pavements shown on the plans.
 - 2) Material which can be excavated using an appropriately sized, heavy-duty, power-operated excavator, backhoe, or shovel, all of which are equipped with bucket-mounted ripping teeth.
 - 3) Material that can be excavated with a hand pick and shovel.
 - 4) Soft or disintegrated bedrock such as weathered shale, clay shale, claystone, or mudstone, or overconsolidated soils such as "hardpan."
 - 5) Previously blasted materials or materials that are intermittently drilled and blasted to merely increase production.
 - c. Blasting Rock. Do not blast rock unless approved.

E. Pipe, Fittings, and Valve Installation

- 1. Pipe Laying.
 - a. Lay pipe with bell ends facing in the direction of laying, unless otherwise directed.
 - b. After placing a length of pipe in the trench, center the spigot end in the bell and force the pipe home.
 - c. Lay all pipe with ends abutting and true to line and grade.
 - d. Deflection of pipe joints in excess of the manufacturer's recommendations will not be permitted.
 - e. Provide a watertight pipe plug or bulkhead to prevent the entrance of foreign material whenever pipe laying operations are not in progress.

- f. Inspect cast metal pipe and fittings for cracks by ringing the pipe with a light hammer while it is suspended.
2. Pipe Cutting.
 - a. Cut pipe in a neat and workmanlike manner without damage to the pipe or lining.
 - b. The end shall be smooth and at right angles to the axis of the pipe.
 - c. Flame cutting of metal pipe by means of an oxyacetylene torch will not be permitted.
3. Push-On Joints.
 - a. Thoroughly clean the surfaces with which the rubber gasket comes in contact just before assembly.
 - b. Then insert the gasket into the groove in the bell.
 - c. Before starting joint assembly, apply a liberal coating of special lubricant to the spigot end.
 - d. With the spigot end centered in the bell, push the spigot end home.
4. Mechanical Joints.
 - a. Center the spigot in the bell.
 - b. Thoroughly clean the surface with which the rubber gasket comes in contact just before assembly.
 - c. Brush these clean surfaces with a special lubricant just before slipping the gasket over the spigot end and into the bell.
 - d. Also brush the lubricant over the gasket before installation to remove the loose dirt and lubricate the gasket as it is forced into its retaining space.
5. Restrained Joints.
 - a. Ball and Socket or Push-On. Assemble and install the ball and socket joint according to the manufacturer's recommendations. Thoroughly clean and lubricate the joint. Check the retainer ring fastener.
6. Joints between Dissimilar Pipe Materials. Make connections to pipe of different materials with adaptors designed to join those materials.

7. Setting Valves.
 - a. Set valves on a firm foundation so that no load will be transferred to the connecting pipe.
 - b. Provide a valve box for every buried valve.
 - c. The valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the operating nut of the valve.
 - d. Set the box cover flush with the surface of the finished pavement unless otherwise shown.

8. Anchoring. Provide all plugs, caps, tees, and bends with a concrete backing and restrained fittings. If shown or specified, prevent movement by attaching suitable metal rods, clamps, or restrained fittings.
 - a. Concrete Backing.
 - 1) Concrete backing shall be Design Mix A concrete as specified in Section 03 30 00, "Cast-In-Place Concrete."
 - 2) Place backing between undisturbed ground and the fitting to be anchored.
 - 3) The area of bearing on the fitting and on the ground shall be as shown.
 - 4) Place the backing, unless otherwise shown, so that the pipe and fitting joints will be accessible for repair.
 - b. Tie Rods.
 - 1) Place steel tie rods or clamps, where permitted, of adequate strength to prevent movement.
 - 2) Paint steel tie rods or clamps with three coats of an approved bituminous paint or coal tar enamel.
 - c. Restrained Fittings. Restrained fittings shall be supplied by the Contractor, as well as concrete backing.

F. **Trench Backfill.** Backfill all trench excavations immediately after pipe is laid as shown and specified.

1. Foundation.
 - a. Build the mains on a good foundation.
 - b. If, in the Engineer's opinion, the material forming the trench bottom is not suitable for a good foundation, replace it with granular pipe bedding as directed.
 - c. Authorized excavation and restoration of the foundation below the trench bottom will be paid for in accordance with the General Conditions.
 - d. Fill unauthorized excavation below the trench bottom with pipe bedding at no cost to the Owner.

2. Pipe Bedding.
 - a. Install all plastic or fiberglass-reinforced plastic (FRP) pipes with a 6-inch-deep granular pipe bed.
 - b. Install all other pipe materials with no pipe bed unless foundation is rock.
 - c. For rock foundations, provide a 6-inch granular pipe bed between rock and pipe for pipes 24 inches in diameter or less and a 9-inch granular pipe bed for pipes larger than 24 inches in diameter.
 - d. Spread granular pipe bedding the full width of trench bottom.
3. Haunching.
 - a. Use compacted selected excavated trench material unless noted otherwise.
 - b. Place in uniform 6-inch loose layers and compact each layer to eliminate the possibility of settlement, pipe misalignment, or damage to joints.
4. Initial Backfill.
 - a. Use selected excavated trench material unless noted otherwise.
 - b. Take care to avoid injuring or moving the pipe.
5. Final Backfill.
 - a. Use excavated trench material unless noted otherwise.
 - b. Use mechanical equipment to place the backfill.
 - c. Do this in such a manner that the material does not free fall, but so that it will flow onto the previously placed material.
 - d. Consolidate the backfill to ensure the minimum possible settlement.
 - e. No compacting of the backfill with mechanical equipment, such as wheeled vehicles, will be permitted unless sufficient cover is provided over the pipe to prevent damage to the pipe.
6. Granular Backfill. When backfilling under pavements, driveways, or as directed, use granular backfill in place of the selected excavated trench material and the excavated trench material. Trench granular backfill shall be used under any existing or future sidewalk, driveway; under all roadways; in any excavation that lies within the 1:1 influence line from any existing edge of sidewalks, driveways or roadways; and as directed by the engineer according to specification section 31 23 23.14.
7. Backfill trenches with Class C concrete where trench excavations pass within 18 inches of column or wall footings and that are carried below bottom of such footings or that pass under wall footings. Place concrete to level of bottom of adjacent footing.
8. Provide 4-inch-thick concrete base slab support for piping or conduit less than 2'-6" below surface of roadways. After installation and testing of

pipng or conduit, provide minimum 4-inch-thick encasement (sides and top) of concrete prior to backfilling or placement of roadway subbase.

9. Bulkheads.
 - a. When granular bedding or backfill is provided, place bulkheads of clay soil across the trench at 100 foot intervals to resist the movement of groundwater through the granular material.
 - b. Carefully compact the bulkheads and extend them approximately 3 feet in the direction of the pipe and from the bottom of the trench to a height of 6 inches above the top of the pipe barrel.
10. Surface Conditions. Periodically attend to the trench surface during the course of the Contract. Maintain the trench surface in a safe condition and not interfering with natural drainage.

3.4 CLEANING

- A. **Cleanup.** After a section of main is tested and accepted, clean the ground surface of all surplus material including stone, broken pipe, construction material, and all other debris.

3.5 DEMONSTRATION

- A. **Leakage Test and Disinfection.** In accordance with Section 01 89 19, "Leakage Test and Disinfection."
- B. **Visual.** With Owner and/or Engineer, visually review the main installation for completion. Demonstrate that all main materials and appurtenances are in conformance with the Contract Documents.
- C. **Final Acceptance.** The visual demonstration for completion of the main installation shall not be considered as final acceptance of the work. Correct all discrepancies "punch listed" at final inspection to the satisfaction of the Engineer and Owner.

- 3.6 **PROTECTION.** Protect the main appurtenances (valves, hydrants, etc.) from damage during subsequent construction operations. Remove any and all protection at the completion of the project.

END OF SECTION

SECTION 33 05 44

HIGH-DENSITY POLYETHYLENE SEWER PIPE

PART 1 - GENERAL

- 1.1 **RELATED DOCUMENTS.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.
- 1.2 **DESCRIPTION OF WORK.** Provide the labor, tools, equipment, and materials necessary to furnish and install the high-density polyethylene (HDPE) sanitary or storm sewer pipe in accordance with the drawings and specifications.
- 1.3 **QUALITY ASSURANCE.** In accordance with Section 33 05 40, "Sewer Pipe, Installation."
- 1.4 **SUBMITTALS.** Submit all submittals in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.
 - A. **Submittal Package No. 1 – Shop Drawings, Certifications, and Test Reports**
 1. Shop Drawings. Detailed plan and profile drawings for all piping showing full details of piping, specials, and connections to existing pipes and structures.
 2. Certifications. Certification of compliance with the referenced standards.
 3. Test Reports. Description of proposed testing methods, procedures, and apparatus.
- 1.5 **JOB CONDITIONS** (Not used)
- 1.6 **DELIVERY, STORAGE, AND HANDLING.** In accordance with Section 33 05 40, "Sewer Pipe, Installation."
- 1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

2.1 MATERIALS

A. HDPE Profile Wall Pipe

1. PE Pipe. HDPE pipe shall conform to American Society for Testing and Materials (ASTM) F 894.
2. PE Plastics. PE plastic shall conform to ASTM D 1248. They shall be made of PE resins classified Type III, Category 5, Grade P34.
 - a. Resin. PE resins shall contain antioxidants and carbon black.

- b. Stress Cracking. PE resin compounds shall have a resistance to environmental stress cracking as determined by the procedure detailed in ASTM D 1693 Condition C with sample preparation by Procedure C of ASTM D 1928 for not less than 200 hours.
 - c. Virgin Material. All pipe shall be made from virgin material or from rework compound obtained from the manufacturer's own production of the same formulation.
 - d. Homogeneous. Pipe shall be homogeneous throughout and be free of visible cracks, holes, foreign material, blisters, or other faults.
- 3. Pipe and Fittings. Pipe and fittings shall meet the requirements of ASTM D 3350.
 - 4. Fittings. Provide factory-made HDPE fittings with joints of proper design or approved adapters to connect the pipe to the fittings. Provide adapters for connection to pipes of different materials.
 - 5. All pipe spigots shall have a "home" mark to facilitate joint closure.
- B. **Pipe Joints.** HDPE sewer pipe joints shall be elastomerically gasketed conforming to ASTM F 894. Thermal-welding of the joints will not be accepted.
 - C. **Exposure to Sunlight.** Take care to protect PE pipe from prolonged exposure to heat or direct sunlight (ultraviolet rays).

PART 3 - EXECUTION

- 3.1 **INSTALLATION.** Install pipe in accordance with Section 33 05 40, "Sewer Pipe, Installation."

END OF SECTION

SECTION 40 05 13

PROCESS PIPING, GENERAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1; Section 40 05 14, "Process Piping, Accessories"; and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** Provide the labor, tools, equipment, and materials necessary to furnish and install the process piping in accordance with the drawings and as specified herein. This section, in conjunction with the corresponding process piping material sections, is intended to cover the supply and installation of all exposed (non-buried) process piping. This work shall also include all pipe supports and restraints, fittings, joints, testing, cleaning, and work on existing exposed process piping. See Division 33 for buried piping.

1.3 QUALITY ASSURANCE

- A. **Codes and Regulatory Agencies.** Perform all work in compliance with all federal, state, and local codes and regulatory agencies.
- B. **Standards.** All materials, testing, and workmanship shall be in conformance with the following standards and as referenced herein.
 - 1. ANSI – American National Standards Institute.
 - 2. ASME – American Society of Mechanical Engineers.
 - 3. ASTM – American Society for Testing and Materials.
 - 4. AWWA – American Water Works Association.
 - 5. NSF – National Sanitary Foundation.

1.4 SUBMITTALS

- A. **General.** Submit the specified submittal packages in accordance with Section 01 33 00, "Submittals" and the pipe material's specific specification section included later in this contract document.

1.5 JOB CONDITIONS

- A. **General.** Verify job conditions which may impact piping layouts and locations prior to ordering.
- B. **Coordination**
 - 1. Coordinate schedule of the work and the location of equipment and conduit to prevent interferences and delays.
 - 2. Coordinate type and materials (gaskets, glands, and bolts) of joints connecting to valves and equipment with the suppliers of each item.

- C. **Field Dimensions.** All piping shall be installed to field dimensions unless specifically stated on drawings.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. **General.** The delivery, storage, and handling of the process piping and accessories shall be in accordance with Section 01 60 00, "Materials and Equipment," and the manufacturer's instructions.
- B. **Handling.** Handle all pipe, fittings, and accessories carefully using proper handling devices. Do not insert lifting devices into barrels of pipe.
- C. **Storage.** Store pipe and fittings on wood blocking or platforms to avoid contact with ground. Keep pipe free from dirt and foreign matter. Plastic and fiberglass-reinforced plastic (FRP) piping shall be shaded but not covered directly to allow air circulation and reduce heat build-up due to direct sunlight.

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.1 GENERAL

- A. **Pipe and Fittings.** All process piping, fittings, and joints shall conform to the drawings and requirements specified in the corresponding section for each type of pipe installed.
- B. **Manufacturer.** All new process piping of one material shall be by a single manufacturer. All process fittings of one material shall be by a single manufacturer. All pipe and fittings manufactured outside the United States shall be certified to ISO 9001:2000 standards for quality assurance.
- C. **Identification**
 - 1. All pipe and fittings 4 inches in diameter and larger shall have the pipe size, material, and class or schedule painted or cast on the exterior pipe surface.
 - 2. All piping less than 4 inches in diameter shall have the pipe size, material, and class or schedule factory marked on the exterior pipe surface.

2.2 JOINTS

A. Flanged

- 1. Standard. Conform to ANSI/AWWA C115/A21.15 or ANSI/ASME B16.1, Class 125, unless otherwise noted on the drawings.
- 2. Gaskets. All joints for 12 inches and smaller shall include 1/8-inch-thick full-face SBR red rubber gaskets unless noted otherwise. All joints for pipe 14 inches and larger shall include 1/8-inch-thick full-face synthetic

rubber gaskets with one or more annular rings. Gaskets shall conform to ANSI/AWWA C111/A21.11 and be rated to for a minimum of 170° F unless noted otherwise. All gasket types shall be suitable for the process material being conveyed.

- a. Air and gas piping shall have high temperature type gaskets, rated to 300° F. Material shall be fluoroelastomer (FKM).

3. Bolts.

- a. Non-submerged Service. Bolts shall have American Standard heavy unfinished hexagonal head and nut dimensions conforming to ANSI B18.2.1 and ANSI/ASME B18.2.2. For bolts of 1-3/4-inch diameter and larger, bolt studs with a nut on each end are recommended. Material for nuts and bolts shall conform to ASTM A 307, Grade B.
- b. Submerged Service. Bolts shall have American Standard heavy unfinished hexagonal head and nut dimensions, all as specified in ANSI B18.2.2, "Square and Hex Nuts Inch Series." For bolts 1-2/4 inches in diameter and larger, bolt studs with a nut on each end are recommended. Material for bolts and nuts shall be Type 316 stainless steel. Utilize anti-seize compound on all nuts.

B. Threaded

1. Standard. Pipe threads shall conform to American Standard Taper Pipe thread ANSI B2.1.
2. Preparation. Threaded joints shall include a Teflon tape for sealant purposes.

C. Grooved and Shouldered

1. Standard. Conform to AWWA C606 unless otherwise noted on the drawings.
2. Couplings shall be ductile iron.
3. Gaskets. Gaskets shall conform to the same material requirements as the flanged joints.
4. Bolts. Bolts and nuts shall conform to the same material requirements as the flanged joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspection

1. All pipe shall be inspected for damage resulting from shipping and handling. Reject and replace all damaged pipe and fittings with a new piece at the Contractor's expense.
2. If any defective pipe or fitting is discovered after installation, remove and replace defective piece with a sound piece at the Contractor's expense.
3. All pipe and fittings shall be kept clean until they are accepted in the completed work.

3.2 INSTALLATION

A. General. Installation of all process piping shall be in accordance with manufacturer's instructions, approved shop drawings, drawings, and as specified herein.

1. Use of flange adapters and flanges, or flexible couplings, shall be acceptable only where shown on the approved dimensional layouts or drawings.
2. Conflicts between the specifications or drawings and the manufacturer's instructions shall be brought to the Engineer/Architect's attention and a solution documented by Field Order.

B. Cutting

1. Pipe cutting shall be neat, smooth, at right angles to the axis of the pipe, and without damage to the pipe, coating, or lining.
2. Flame cutting will not be permitted.
3. Ream all pipes and tubing to full inside diameter after cutting. Remove sharp edges on cut ends. Remove all cuttings from inside the pipe before installation.

C. Alignment

1. Install straight runs true to line and elevation and vertical pipe plumb in all directions.
2. Install parallel or perpendicular to building walls unless shown otherwise on the drawings.
3. Piping without specific locations or elevations indicated shall be located to avoid obstructions and shall not obstruct corridors, walkways, equipment areas, or work areas. A minimum headroom clearance of 7 feet 6 inches shall be provided under all piping unless otherwise noted.

D. Temporary Caps. Provide temporary caps or plugs at all pipe openings at the end of each day's work and where otherwise requested by the Engineer/Architect.

E. **Pipe Supports, Hangers, and Blocking.** Furnish and install, whether shown on the drawings or not, all required supports, hangers, and blocking.

1. Design, and provide a complete system of pipe supports with inserts, bolts, nuts, restraining and hanger rods, washers, miscellaneous steel, sliding Teflon plate, and accessories as indicated or specified. The term pip support included hangers, guides, restraints, anchors, and saddles. Provide all support systems and the design of all support systems for all piping as specified herein.
2. The Contractor shall provide pipe support locations, configurations, and details through accepted shop drawing submittals stamped by a Registered Professional Engineer.
3. The Contractor shall be responsible for the proper design, fabrication, location, shop drawings, and installation of all pipe supports in accordance with the specified requirements.
4. Spacing of supports and hangers shall be as shown on the drawings, and in no instance exceed the manufacturer's recommendations for the type and class of pipe and temperature of liquid being carried.
5. Pipe hangers shall be provided at all bends and tees, and on either side of all valves.
6. Pipe supports, hangers, and thrust blocks shall be of the size, shape, and quantities as shown on the drawings or as required.
7. Thrust blocking shall be provided at all bends and tees, where changes in pipe diameter occur at reducers or in fittings, at all dead ends, and at pipes which are tapped or plugged.
8. All proposed hangers, supports, and blocking must be approved before placement.

F. **Pipe Fittings**

1. Unions. Unions shall be provided where shown on the drawings, and at the following locations:
 - a. Downstream of each screwed end valve.
 - b. Screwed or flanged union at each piece of equipment.
 - c. Dielectric unions where dissimilar metals are connected except at bronze or brass valves installed in ferrous piping.
 - d. Where necessary to install or dismantle piping.
2. Reducers. Eccentric reducers shall be installed where reducers are shown and where air or water pockets would occur in mains because of reduction in pipe size.
3. Transitions. Provide all necessary adapters, specials, and connector pieces when connecting different type and sizes of pipe, connecting pipe by different manufacturers, or connecting to equipment, valves, or meters.

G. **Joints**

1. Flanged.

- a. Clean. Flange faces shall be clean. Hexagonal bolts and nuts shall be clean and lubricated.
- b. Alignment. Joints shall be fitted so that contact faces bear uniformly on the gasket and are made up with uniform bolt stress.
- c. Assembly. Assemble joints without forcing.

3.3 SCHEDULES

A. PIPE MATERIALS SCHEDULE

- 1. The piping shown on the drawings shall conform to the specific materials specifications provided in Division 40. The plans provide general information on pipe sizes, fittings, and materials. The schedule provided below is the provided as a general guide to be used to describe the pipe materials to be used unless otherwise noted on the drawings or specifications.

SCHEDULE NOT USED.

3.4 FIELD QUALITY CONTROL

- A. **Testing.** All process piping shall be tested for leaks in accordance with Section 01 89 19, "Leakage Test and Disinfection." Visible leakage will not be accepted in exposed piping. If the test fails, repair or replace the piping and retest.
- B. **Cleaning.** All process piping shall be thoroughly cleaned and flushed prior to placing in service in a manner acceptable to the Engineer/Architect. Piping shall be inspected and all debris, dirt, and foreign matter removed. Disinfection shall be done in accordance with Section 01 89 19, "Leakage Test and Disinfection."

END OF SECTION

SECTION 40 05 13.33

PROCESS PIPING, COPPER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions; Division 1; Section 40 05 13, "Process Piping, General"; and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** Provide the labor, tools, equipment, and materials necessary to furnish and install the copper process piping.

1.3 QUALITY ASSURANCE

- A. **General.** In accordance with Section 40 05 13, "Process Piping, General."

1.4 SUBMITTALS

A. General

- 1. Submit all submittals in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.

B. Submittal Package No. 1 – Shop Drawings and Product Data

- 1. Submit shop drawings and product data for review and approval. Do not deliver or install piping or fittings before this submittal package has been reviewed and approved. Shop drawings and product data shall include:
 - a. Illustrated Product Data. Submit the product data of the pipe, fittings, manufacturer's name, pipe material, size, class, and gaskets specified on the drawings.
 - b. The manufacturer's recommended maximum unsupported length of the size piping specified.
 - c. Affidavit of compliance and certification of design and performance.
 - d. Information on field and installation requirements, including mounting and access requirements and total weight of each component and each complete assembly.
 - e. Description of proposed test methods, procedures, and apparatus.
 - f. Coatings and linings.

C. Submittal Package No. 2 – Layout Drawings

1. Submit layout drawings according to this specification for review and approval. Do not deliver or install piping or fittings before this submittal package has been reviewed and approved. Layout drawings shall include:
 - a. Detailed plan and profile drawings showing details of piping, fittings, end connections, valve locations, and locations of all flanged joints.
 - b. Piping supports, hangers, and thrust block type and locations.

1.5 JOB CONDITIONS

- A. **General.** In accordance with Section 40 05 13, "Process Piping, General."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. **General.** In accordance with Section 40 05 13, "Process Piping, General."

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Copper Pipe

1. General. All copper process piping shall comply with the following, unless otherwise noted on the drawings or herein.
 - a. Standard. ASTM B 88, Type L, hard drawn.
 - b. Joints. Soldered except at valves which may be flared or compression type.

B. Joints

1. Soldered.
 - a. Standard. Comply with ASTM B 32.
 - b. Material. 95-5 tin antimony solder.

C. Fittings

1. Wrought Copper Solder Joint Fittings. ANSI/ASME B16.22, streamlined pattern.
2. Wrought Copper and Bronze Groove End Fittings. ASTM B 75 tube and ASTM B 584 bronze castings.

PART 3 - EXECUTION

3.1 GENERAL

A. In accordance with Section 40 05 13, "Process Piping, General."

B. Hangers

1. Furnish and install isolators where dissimilar metals occur between the pipe and hangers.

END OF SECTION

SECTION 40 05 13.73

PROCESS PIPING, PVC AND CPVC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions; Division 1; Section 40 05 13, "Process Piping, General"; and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **General.** Provide the labor, tools, equipment, and materials necessary to furnish and install the polyvinyl chloride (PVC) and chlorinated polyvinyl chloride (CPVC) process piping.

1.3 QUALITY ASSURANCE

- A. **General.** In accordance with Section 40 05 13, "Process Piping, General."

1.4 SUBMITTALS

A. General

- 1. Submit all submittals in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.

B. Submittal Package No. 1 – Shop Drawings and Product Data

- 1. Submit shop drawings and product data review and approval. Do not deliver or install piping or fittings before this submittal package has been reviewed and approved. Shop drawings and product data shall include:
 - a. Illustrated product data. Submit the product data of the pipe, fittings, manufacturer's name, pipe material, size, class, and gaskets specified on the drawings.
 - b. Submit the manufacturer's recommended maximum unsupported length of the size piping specified.
 - c. Affidavit of compliance and certification of design and performance.
 - d. Information on field and installation requirements, including mounting and access requirements and total weight of each component and each complete assembly.
 - e. Description of proposed test methods, procedures, and apparatus.
 - f. Coatings and linings.

C. Submittal Package No. 2 – Layout Drawings

1. Submit layout drawings according to this specification for review and approval. Do not deliver or install piping or fittings before this submittal package has been reviewed and approved. Layout drawings shall include:
 - a. Detailed plan and profile drawings showing details of piping, fittings, end connections, valve locations, and locations of all flanged joints.
 - b. Piping supports, hangars, and thrust block type and locations.

1.5 JOB CONDITIONS

- A. **General.** In accordance with Section 40 05 13, "Process Piping, General."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. **General.** In accordance with Section 40 05 13, "Process Piping, General."

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.1 PVC PIPE AND FITTINGS

A. Design Criteria

1. Pipe and Fitting Materials.
 - a. Type. Materials shall be Type 1, Grade 1, rigid.
2. Standards.
 - a. PVC pipe shall conform to American Society for Testing and Materials (ASTM) D 1785, PVC 1120.
 - b. All PVC pipe fittings shall conform to ASTM D 2467, PVC 1120.
3. Pressure Rating. PVC process piping and fittings shall be suitable for a minimum working pressure of 150 pounds per square inch (psi), unless noted otherwise on the plans.
4. Minimum Wall Thickness. PVC process piping and fittings shall be Schedule 80 unless noted otherwise on the plans.

B. Pipe and Fitting Materials

1. Type. Materials shall be Type 1, Grade 1, rigid.

C. Joints

1. General. All PVC pipe shall be joined with solvent-cemented socket-type joints except where flanged or threaded joints are required at expansion joints, valves, flowmeters, or equipment connections, or when shown otherwise on the plans or directed by the Engineer.
2. Solvent Cement.
 - a. Solvent primer shall conform to ASTM F 656 and be National Sanitary Foundation (NSF-) approved for potable water.
 - b. Cement shall be a heavy-bodied, medium-setting, high-strength, chemical-resistant solvent cement, conforming to ASTM F 493 and shall be NSF-approved for potable water.
 - c. Cement shall be suitable for both PVC and CPVC applications.
 - d. Primer and cement shall be from the same manufacturer.
3. Flanged Joints.
 - a. In accordance with Section 40 05 13, "Process Piping, General," paragraph 2.2 A.
 - b. Joining. PVC flanges shall be joined to the pipe by solvent cementing.
 - c. Threaded. In accordance with Section 40 05 13, "Process Piping, General," paragraph 2.2 B.

D. Finishes

1. Pipe and Fitting Exterior. Perform all finishes in the field in accordance with Section 09 90 00, "Painting."
2. Pipe and Fitting Interior. None.

2.2 CPVC

- A. **Material.** Pipe and fittings noted for CPVC construction shall conform to PVC requirements noted above, with the following modification. CPVC shall conform to ASTM D 1784, Cell Class 23447-B, Schedule 80, unless noted otherwise. CPVC shall be manufactured in compliance with ASTM F 441.

PART 3 - EXECUTION

- 3.1 **GENERAL.** In accordance with Section 40 05 13, "Process Piping, General."

3.2 INSTALLATION

- A. **Joints.** Installation shall be in accordance with manufacturer's instructions, as shown on the plans, with Section 40 05 13, and as specified herein.
1. Solvent Cemented. Install the PVC and CPVC pipe and solvent-cemented joints shall be in strict accordance with manufacturer's instructions. Give special attention manufacturer's recommended shelf life for primer and solvent cement.

END OF SECTION

SECTION 40 05 14

PROCESS PIPING, ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions; Division 1; Section 40 05 13, "Process Piping, General"; and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** Provide the labor, tools, equipment, and materials necessary to furnish and install the process piping accessories.

1.3 QUALITY ASSURANCE

- A. **Codes and Regulatory Agencies.** In accordance with Section 40 05 13.
- B. **Standards.** All materials, testing, and work performed shall be in conformance with the following standards as referenced herein:
 - 1. ANSI – American National Standards Institute.
 - 2. ASTM – American Society for Testing and Materials.
 - 3. AWWA – American Water Works Association.
 - 4. MSS – Manufacturers Standardization Society of the Valve and Fittings Industry.

1.4 SUBMITTALS

A. General

- 1. Submit all submittals in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.

B. Submittal Package No. 1 – Shop Drawings and Product Data

- 1. Submit shop drawings and product data for review and approval. No piping accessories shall be delivered or installed before this submittal package has been reviewed and approved. Shop drawings and product data shall include:
 - a. Illustrated product data.
 - b. Affidavit of compliance and certification of design and performance.
 - c. Information on field and installation requirements, including mounting and access requirements and total weight of each component and each complete assembly.
 - d. Description of proposed test methods, procedures, and apparatus.
 - e. Coatings and linings.

1.5 JOB CONDITIONS

- A. **General.** Coordinate work with that of other sections to provide proper combination of pipe size, core or sleeve size, and link size.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. **General.** The delivery, storage, and handling of the piping accessories shall be as specified in Section 40 05 13, "Process Piping, General."

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.1 MECHANICAL PIPE SEALS

- A. **General.** Mechanical pipe seals shall be expandable link type rubber seals to fill the annular space between pipe or conduit and the cored hole or sleeve through which it passes. The seals shall provide air tightness and water tightness as well as electrical insulation between the pipe or conduit and wall or floor opening.

- B. **Application**

1. Pipes or conduits passing through sleeves or cored openings in exterior walls or walls subject to hydrostatic pressure shall be sealed at each face of the wall.
2. All pipes or conduits passing through floor, roof or interior wall sleeves or cored openings shall be sealed at one face only, unless specifically shown otherwise.
3. Included in this section are pipes and conduits including round electrical ducts. These are all referred to as pipes in the balance of this section.

- C. **Products**

1. General Use. Seals shall incorporate an ethylene-propylene dienemonomer (EPDM) rubber sealing element with 316 stainless steel bolts and nuts and glass reinforced nylon plastic plates.
2. Seals shall be sized in accordance with manufacturer's recommendations based upon pipe size.
3. Cored opening size shall be as recommended by the mechanical seal manufacturer.
4. Manufacturer. Seals shall be Link-Seal, Service Designation S (corrosive service), by Thunderline Corporation or approved equal.

2.2 WALL AND FLOOR PIPES AND PIPE SLEEVES

- A. **Wall and Floor Pipes**

1. Type. Wall and floor pipes shall be of the same material and wall thickness specified for the connected piping.

2. Collar. An integral collar shall be included at the midpoint of the wall or floor pipe for anchorage and water tightness. Collar shall be integral with the body or continuously welded on both sides to the body.
3. End Connections. End connections shall be as shown on the drawings. Mechanical joint bells and flanged ends shall be drilled and tapped for studs. Studs of the same material as connected piping shall be provided. Submerged or buried studs shall be Type 304 stainless steel.

B. Pipe Sleeves

1. Type. Pipe sleeves shall be ductile iron designed for a minimum working pressure of 350 pounds per square inch (psi).
2. End Connections. Pipe sleeve end connections shall be as shown on the drawings.
3. Size. Pipe sleeve dimensions shall be as required for pipes to pass through the sleeve. Length shall be as required or as shown on the drawings.

2.3 PIPE SUPPORT

A. **General.** Furnish and install all necessary restraints, blocks, bracing, supports, or hangers, including all necessary miscellaneous steel, inserts, anchors, nuts, bolts, and concrete to support and anchor the piping as shown on the drawings and as required to prevent displacement, vibration, sagging, warping, or failure of the piping expansion and contraction. Location of all supports shall be as required by the piping manufacturer.

1. Design, and provide a complete system of pipe supports with inserts, bolts, nuts, restraining and hanger rods, washers, miscellaneous steel, sliding Teflon plate, and accessories as indicated or specified. The term pip support included hangers, guides, restraints, anchors, and saddles. Provide all support systems and the design of all support systems for all piping as specified herein.
2. The Contractor shall provide pipe support locations, configurations, and details through accepted shop drawing submittals stamped by a Registered Professional Engineer.
3. The Contractor shall be responsible for the proper design, fabrication, location, shop drawings, and installation of all pipe supports in accordance with the specified requirements.
4. Spacing of supports and hangers shall be as shown on the drawings, and in no instance exceed the manufacturer's recommendations for the type and class of pipe and temperature of liquid being carried.
5. Pipe hangers shall be provided at all bends and tees, and on either side of all valves.
6. Pipe supports, hangers, and thrust blocks shall be of the size, shape, and quantities as shown on the drawings or as required.
7. Thrust blocking shall be provided at all bends and tees, where changes in pipe diameter occur at reducers or in fittings, at all dead ends, and at pipes which are tapped or plugged.
8. All proposed hangers, supports, and blocking must be approved before placement.

- B. **Standard.** Pipe hangers shall be in accordance with MSS Standard Practice SP-58 unless noted otherwise on the drawings.
- C. **Types.** The following types of pipe supports are acceptable.
 - 1. Hanger Type.
 - a. Adjustable Clevis. Clevis shall be constructed of carbon steel unless noted otherwise. Clevis shall be in compliance with MSS SP-69, Type 1.
 - b. Trapeze. Universal trapeze assembly shall be constructed of carbon steel unless noted otherwise. Trapeze assembly shall be Anvil Figure 46, or equal.
 - c. Structural Attachments.
 - 1) Welded Steel Bracket. MSS SP-69, Types 31, 32, and 33.
 - 2) Malleable Concrete Insert. MSS SP-69, Type 18.
 - 2. Support Type.
 - d. Pipe Saddle Support. MSS SP-69, Types 35, 36, and 38.
 - e. Pipe Stanchion Saddle. MSS SP-69, Type 37.
 - 3. Any additional pipe support required not listed above shall be submitted to the Engineer/Architect for review.
- D. **Coatings.** Conform to Section 09 90 00, "Painting."
 - 1. Steel items shall be hot dip galvanized at the factory unless otherwise noted on the drawings.
 - 2. Steel or malleable iron materials used for support of copper piping shall be copper plated.

2.4 CONCRETE PIPE SUPPORT

- A. **General.** Install concrete pipe support and thrust blocking as shown on the drawings and at the locations indicated or where directed.

2.5 CORPORATION STOPS

- A. **General.** Install corporation stops where shown on the drawings. Corporation stops shall be bronze body and ground key plug with AWWA C800 taper threaded inlet and outlet to match the connecting piping material.

2.6 EXPANSION COUPLINGS

- A. **General.** Expansion couplings shall be arch type, constructed of a single piece of synthetic or natural rubber with wire reinforcing and integral full faced flanges. The wall thickness, dimensions, exterior coating, control rod

requirements, and number of arches shall be in accordance with manufacturer's recommendations.

B. Service

1. Pressure. Pressure rating shall be the same as the connected piping. See appropriate process piping specification sections for pipe pressure ratings.
2. Sludge Piping. Provide filled arches on expansion couplings on all sludge piping in accordance with manufacturer recommendations.

C. Joints. Joints shall be flanged in accordance with ANSI B12.1. Flanges shall be constructed of resilient rubber, full face, with galvanized metal or baked enamel ductile iron retaining rings providing a metal backup ring behind the rubber flange.

D. Manufacturer

1. General Rubber Corporation.
2. Mercer Rubber Co.
3. Or equal.

2.7 SLEEVE COUPLINGS

A. General. Provide sleeve couplings where shown on the drawings to tightly seal piping without leakage and allow for deflection and vibration within the pipe line and meet the requirements of AWWA C219.

B. Construction

1. Followers shall be constructed of cast iron or ductile iron.
2. Sleeves shall be constructed of carbon steel or ductile iron.
3. Bolts. Bolts shall be of a corrosion-resistant material.
4. Gaskets. Provide resilient gaskets to cushion vibration and safely accommodate for pipe deflection or longitudinal pipe movement without leakage. Gaskets shall be suitable for the service of the pipe.
5. Coating. Coatings shall be according to manufacturer's instructions and be suitable for the service of the pipe. The couplings shall be shop primed and field painted in accordance with Section 09 90 00, "Painting."

C. Service

1. Pressure. Couplings shall be pressure rated for the same pressure as the connected piping. See appropriate process piping specification sections for pipe pressure ratings.

D. Manufacturer

1. Dresser. Style 38/138.
2. Smith Blair. Style 411.
3. Romac. Style 400.

4. JCM. Style 201.
5. Ford Meter Box. Style FC3/FC4.

2.8 FLANGED COUPLING ADAPTERS

A. **General.** Flanged coupling adapters shall be one end flanged and one end sleeve type flexible coupling and meet the requirements of AWWA C219.

B. Ductile Iron Pipe

1. Adapters shall be harnessed as required to restrain pressure piping.
2. For adapters 12 inches in diameter or less, harnessing shall be with 1/2-inch stainless steel anchor studs. Number of studs shall be according to manufacturer's recommendations.
3. For adapters larger than 12 inches in diameter, harnessing shall be with a minimum of four corrosion resistant alloy steel bolts tied to adjacent flange or lugs on the pipe. Number of bolts shall be according to manufacturer's recommendation.

C. Coatings

1. Coat interior with factory-applied coal tar enamel.
2. Coat exterior as specified in Section 09 90 00, "Painting."

D. Service

1. Pressure. Flanged coupling adapters shall be pressure rated for the same pressure as the connected piping. See appropriate process piping specification sections for pipe pressure ratings.

E. Manufacturer

1. Smith Blair.
2. Dresser.
3. Or equal.

2.9 DISMANTLING JOINTS

A. **General.** Dismantling joints shall be provided where shown on the drawings to tightly seal piping without leakage and allow for deflection and vibration within the pipe line. This fitting shall also be fully restrained.

B. Construction

1. The joints shall be constructed of cast iron or ductile iron.
2. Bolts. Bolts shall be of a corrosion resistant material.
3. Gaskets. Provide resilient gaskets to cushion vibration and safely accommodate for pipe deflection or longitudinal pipe movement without leakage. Gaskets shall be suitable for the service of the pipe.
4. Coating. Coatings shall be according to manufacturer's instructions and be suitable for the service of the pipe. The joints shall be shop primed and field painted in accordance with Section 09 90 00, "Painting."

C. Service

1. Pressure. Dismantling joints shall be pressure rated for the same pressure as the connected piping. See appropriate process piping specification sections for pipe pressure ratings.

D. Manufacturer

1. Dresser. Style 131.
2. Smith Blair. Model 975.
3. JCM. Restrained Style 309.
4. Romac. Style DJ400.
5. Ford Meter Box. Style FDJ.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. **General.** Install all piping accessories according to manufacturer's instructions, and as shown on the drawings.

END OF SECTION

SECTION 40 05 23

PROCESS VALVES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. **Scope of Work.** The Contractor shall provide the labor, tools, equipment, and materials necessary to furnish and install the valves and accessories in accordance with the drawings and as specified herein. Provide all valves required for complete functional systems.

1.3 QUALITY ASSURANCE

- A. **Codes and Regulatory Agencies.** Perform all work in compliance with all federal, state, and local codes and regulatory agencies.
- B. **Standards.** Materials and workmanship shall be in accordance with the following standards as referenced herein:
 - 1. AGA - American Gas Association.
 - 2. ANSI - American National Standards Institute.
 - 3. ASME - American Society of Mechanical Engineers.
 - 4. ASTM - American Society for Testing and Materials.
 - 5. AWWA - American Water Works Association.
 - 6. IEC - International Electrotechnical Commission.
 - 7. NEMA - National Electrical Manufacturers Association.
 - 8. NSF - National Sanitation Foundation.

1.4 SUBMITTALS

- A. **Shop Drawings and Product Data.** Shop drawings and product data for each type of valve shall be submitted to the Engineer/Architect for review. Shop drawings shall be in accordance with Section 01 33 00 and shall include:
 - 1. Manufacturer's name.
 - 2. Body, seating, and trim materials.
 - 3. Dimensions.
 - 4. Connection details.
 - 5. Required clearances.
 - 6. Parts list with materials and part numbers for the valves and accessories.
 - 7. Maximum operating pressure and temperature ratings.
 - 8. Operator torque calculations.
 - 9. Manufacturer's instructions.
 - 10. Electrical data when applicable.

B. Test Reports

1. Submit hydrostatic test reports as specified in this section.

- C. Operation and Maintenance Manuals.** Operation and Maintenance (O&M) manuals shall be submitted to the Engineer/Architect in accordance with Sections 01 33 00 and 01 78 23 of these specifications. The initial review copy of the O&M manual and the revised copies shall be submitted prior to delivery of the equipment.

1.5 JOB CONDITIONS

A. Valve Service

1. Submerged valves shall be designed for submerged service.
2. Buried valves shall be designed for buried service.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. General.** The delivery, storage, and handling of the process piping valves and gates shall be in accordance with Section 01 60 00 and the manufacturer's instructions.
- B. Storage.** Store valves under cover and out of direct contact with the ground.
- C. Handling.** Handle valves to avoid damage. Valves which are cracked, dented, dropped, or otherwise damaged will not be accepted.

1.7 SPECIAL WARRANTY

Not used.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Manufacturer

1. Each type of valve shall be by only one manufacturer.

B. Valve Ends

1. All joint materials shall be provided in accordance with the requirements for suitability to handle pressure, temperature, and chemical resistance for intended use and application.
2. All valves shall be joined to pipe with the following methods and materials:
 - a. Flanged joint materials are to be provided in accordance with Section 40 05 13, "Process Piping, General," paragraph 2.2 A.
 - b. Threaded. In accordance with Section 40 05 13, "Process Piping, General," paragraph 2.2 B.

3. Valves on exposed piping shall be as shown on drawings, usually with a symbol. Connections shown include:
 - a. Flanged. (FL) Valves shall be rated for 150 psi working pressure unless noted otherwise in the Valve Schedule or on the drawings. Flanges to match ANSI B16.5, Class 150 unless noted otherwise.
 - b. Screwed. National (tapered) pipe thread (NPT).
 - c. Socket. Conform to specifications for adjacent piping.
 - d. True Union. Conform to specifications for adjacent piping. True union ends shall be used for all polyvinyl chloride (PVC) valves.
4. Buried. Mechanical joint (MJ), unless noted otherwise on the drawings.
 - a. MJ. AWWA C111, rubber gasket joints for ductile iron pressure pipe and fittings.
 - b. Screwed. NPT.
 - c. Socket. Conform to specifications for adjacent piping.

C. Seals

1. Buried and submerged valves shall have enclosed, nonlubricated, watertight stem seals.

D. Operators

1. Valves shall open counterclockwise unless noted otherwise on the Valve Schedule or on the drawings.
2. All valves shall have permanent open direction indicator.
3. Coordinate valve mounting position with respect to operating convenience, maintenance access, and safety. Install chainwheel operators on manually operated valves more than 60 inches (1500 mm) above floor. Extend chains to 36 inches (900 mm) above finished floor elevation. Where valves are above aisles, provide 1/2-inch stainless steel hook bolt to tie chains to sides to keep chain out of walking area.
4. Valves which are installed with improper orientation shall be removed and reinstalled at no additional cost to the Owner.
5. Manually operated valves, with or without extension stems, shall require not more than 40-pound pull on manual operators to open or close the valve against specified criteria or process operating conditions.
6. Gear actuators shall meet the requirements of Section 2.3 of this specification. Gear actuators and valve components shall be able to withstand a minimum pull of 200 pounds on manual operator and input torque of 300-foot pounds to actuator nut.
7. Electric operators shall meet the requirements of Section 2.3 of this specification. Valve accessories for handwheels or chainwheels shall meet the requirements of Section 2.4 of this specification.
8. Manual operators shall include handwheel, chainwheel, crank, lever, or T-handle wrench shall meet the requirements as specified in Section 2.4 of this specification.

E. Coatings

1. Valve Operators and Accessories Inside Structures.
 - a. Shop priming shall be in conformance with Section 09 90 00, "Painting."
 - b. Factory finishing shall be in conformance with Section 09 90 00, "Painting."
2. Buried Valves, Operators, and Accessories.
 - a. All buried valve operators and accessories shall be coated with a bituminous material in conformance with ANSI A21.10 (AWWA C110).
3. Painted Surfaces. Unless noted otherwise, all interior and exterior ferrous surfaces of all valves, operators, and accessories shall be primed and finish painted in the factory in accordance with Section 09 90 00, "Painting."
4. All valve operator and accessory coatings in contact with potable water shall meet NSF Standard 61 and will have to be listed by NSF and/or the Ohio Environmental Protection Agency (EPA).
5. Stainless steel surfaces shall not be painted unless otherwise noted.

2.2 VALVE TYPES

A. Air Release Valve, Sewage

1. Body and cover shall be cast iron conforming to ASTM A 126.
2. Internal linkage, stem, and concave float shall be stainless steel.
3. Seats: Stainless steel or brass and Buna-N.
4. 2-inch NPT inlet and 1/2-inch NPT outlet.
5. Orifice 3/16-inch diameter for 150 psi rated pressure, 3/32-inch diameter for 300 psi rated pressure.
6. Provide blowoff valve, inlet valve, and shutoff valve for backflushing.
7. Rated for 150 pounds per square inch (psi).
8. Valves shall have backwash accessories to clean the valve consisting of the following items:
 - a. Inlet shut-off bronze valve.
 - b. Blow-off bronze valve.
 - c. Clean water inlet bronze valve.
 - d. Quick disconnect coupling to accommodate hose connection.
9. Manufacturers.

- a. Apco Valve and Primer Corporation, Model 450.
- b. GA Industries Figure 920.
- c. Val-matic wastewater air release valve.
- d. Or approved equal.

B. Air and Vacuum Valve Assembly

1. Air and vacuum valves shall consist of a ductile iron body as per ASTM A536, Grade 65-45-12, stainless steel float, and tight closing seat with Buna-N seal.
2. All internal parts, such as float guide, bushings, and baffle retaining screws shall be either stainless steel or bronze.
3. Stainless steel float shall be center guided for positive seating and rated 1,000 psi nonshock service.
4. Valve shall have flanged inlet and threaded discharge.
5. The baffle shall shield the float from direct impact of air and water to prevent premature float closure.
6. The seat shall slip fit into the baffle and lock in place without any distortion, and shall be easily removable.
7. Air and vacuum valve assemblies shall have a rating of 125 psi or as noted in the Valve Schedule.
8. A surge check valve shall be provided at the inlet side of the air and vacuum valve. The surge check valve shall not interfere with the operation of the air and vacuum valve. The body shall be constructed of ductile iron as per ASTM A 536, Grade 65-45-12.
9. Air and vacuum valve shall have 1 inch tap for connection of secondary air release valve. Secondary air release valve shall have a 1 inch inlet and 1/2 inch outlet. The body is to be constructed of cast iron according to ASTM A126, Grade B. A 1 inch gate valve shall be located between the secondary air release valve and the air and vacuum valve.
10. Manufacturer.
 - a. Apco Valve and Primer Corporation, Model 1704-15.
 - b. Or equal.

C. Air and Vacuum Valves

1. Air and vacuum valves shall be properly sized and consist of cast iron body and cover, stainless steel float, tight closing seat with Buna-N seal.
 - a. Internal parts, such as float guide, bushings, and baffle retaining screws shall be either stainless steel or bronze.

- b. Valves shall have threaded discharge.
- c. Manufacturers.
 - 1) Watts
 - 2) Clow
 - 3) Crispin
 - 4) Or equal

D. Ball Valves

1. Full Port, Steel Body Ball Valves, Resilient Seat.

- a. Body shall be carbon steel ASTM A216, Grade WCB with flanged ends. Provide flanges or unions in piping on both sides of threaded valves for removal. Valves 2” in diameter and smaller shall be threaded, and have one-piece body. Valves 2-1/2” and larger shall be 2-piece split body.
- b. Valves rated for 150 psi working pressure unless noted otherwise in the Valve Schedule or on the drawings.
- c. Valve shall be full port model. Ball shall be Type 316 stainless steel.
- d. Packing shall be multiple rings of polytetrafluorethylene (PTFE) or modified PFTE.
- e. Body seals, seats, stem seals shall be reinforced PTFE recessed in the machined body.
- f. Bearings and Thrust Bearing shall be reinforced PTFE or polyfill.
- g. Upper stem shall be Type 316 stainless steel, ASTM 479.
- h. Manufacturer.
 - 1) McCanna – Marpac, J-Series Flanged Full Port Resilient Seat Ball Valve
 - 2) Worchester Series 82
 - 3) Metso Neles Series 9000
 - 4) Velan Split Body
 - 5) Trueline PN 20
 - 6) Or equal

2. Polyvinyl Chloride (PVC Ball Valves).

- a. Body shall be Schedule 80 true union, full port type constructed of thermoplastic PVC Type I, ASTM D1784 cell classification 12454.
- b. Valves shall be a true union design with both socket and threaded end connectors. For valves 2 inch diameter and smaller, provide flanges or unions in piping on both sides of valve for removal.
- c. Operators: Lever operated unless noted otherwise in Valve Schedule or on plans.
 - 1) Actuators: Electric actuators for PVC ball valves shall be 115 VAC with thermally protected, reversing motor in NEMA 4X rated enclosure. Actuator shall have manual override. Actuators shall be mounted in the factory and delivered as unit. Actuators shall be same manufacturer as valve

- d. Materials and construction.
 - 1) Ball and valve Body: PVC
 - 2) Seat and seals: PFTE (Teflon with elastomeric backing cushions).
 - 3) Seals and O-rings: Viton
 - 4) Ends: Socket or Threaded. For all valves greater than 1 inch diameter, provide flanges in piping on both ends of valves for removal.
 - e. Manufacturer.
 - 1) Spears
 - 2) Chemtrol, Division of Nibco
 - 3) Hayward
 - 4) ASAHI America
 - 5) Or equal
3. 2-Way, Stainless Steel Ball Valves, 2-Inch and Smaller
- a. Body shall be standard ball with circular, full port type constructed of Type 316 Stainless Steel for valves for air, water, and gas service.
 - b. Working pressure: 250 psi minimum, unless noted otherwise.
 - c. Valves shall be a threaded design. For all valves 2 inch diameter or smaller, provide flanges or unions in piping on both ends of valves for removal.
 - d. Actuators: Electric actuators for PVC ball valves shall be 115 VAC with thermally protected, reversing motor in NEMA 4X rated enclosure. Actuator shall have manual override. Actuators shall be mounted in the factory and delivered as unit. Actuators shall be same manufacturer as valve.
 - e. Materials and construction
 - 1) Body, Ball and Stem: 316 SS
 - 2) Seats and Seals: TFE
 - 3) Ends: Threaded
 - f. Manufacturer.
 - 1) Velan
 - 2) Or approved equal

E. Butterfly Valves

- 1. Cast Iron Body, Metal Seat.
 - a. Butterfly valves shall conform to AWWA C504, except as modified herein.
 - b. Valves shall be designed to comply with AWWA Class IV tight shutoff against a differential pressure of 150 psi.
 - c. The valve body shall be constructed of ductile iron as per ASTM A-126, Class B or cast iron with a minimum rated internal working pressure of 250 psi.
 - d. Valve body shall include a 316 stainless steel seat ring that is mechanically retained without use of clamping devices, adjusting segments, or other hardware being in the waterway.

- e. Valve disc shall be flow through type, ductile iron. Resilient seat shall be located on edge of the disc, and shall seal against mating 316 stainless steel body seat with 360 degree uninterrupted contact.
- f. The resilient seat shall be locked to the disc by a 316 stainless steel retaining ring and 316 stainless steel cap screws, and shall be field adjustable without any tools other than a standard socket wrench. Replacement of the seat in the field shall be possible without valve disassembly.
- g. The shaft shall be Type 316 stainless steel with 316 stainless steel tapered pins for attachment of disc to shaft.
- h. Internal and external bolts, fasteners, and other hardware including pins, set screws, studs, bolts, nuts, washers, and cap screws shall be 316 SS.
- i. Both the operating and thrust shafts shall be Type 316 stainless steel.
- j. Shafts seal shall be self-adjusting V-type chevron, Ethylene Propylene (EPDM) or Buna S material.
- k. Bushing shall be self-lubricating, reinforced Teflon with fiberglass backup shell, or shall be sleeve type fiberglass reinforced PFTE with EPDM sSeat for valves small than 24-inch diameter.
- l. Gear Actuator for Manual Valves
 - 1) Valves shall be provided with gear actuators conforming to AWWA C504
 - 2) Gear actuators shall be constructed for minimum differential pressure of 25 psig
- m. Operators: Refer to Section 2.3 for gear operators and electric motor operators. Refer to Section 2.4 for requirements for manually operated valves including lever, handwheel, chainwheel, or T-wrench operators, or other valve accessories.
- n. Manufacturer.
 - 1) Valmatic American Model 2000
 - 2) M&H Valve Company, Style 4500
 - 3) Or equal

2. Cast Iron Body, Resilient Seat.

- a. Conform to AWWA C504 except as specified herein. Valves rated for 150 psi working pressure unless noted otherwise in the Valve Schedule or on the drawings.
- b. Body shall be cast iron ASTM A126 or ASTM A48 with planed ends or mechanical joint ends per valve schedule included in later in this section.
- c. Disc shall be ductile iron ASTM A576 with 316 stainless steel seating edge.
- d. Valves shall be designed for AWWA Class IV tight shutoff against a differential pressure of 150 psi.
- e. Shaft shall be ASTM A276 Type 304 stainless steel.
- f. Body and stuffing box shall be ASTM A126, Class B cast iron. Shaft seals are self-compensating, and renewable, V-type packing with a minimum of four sealing rings.

- g. Gland assembly shall be cast bronze ASTM B584.
- h. Packing gland shall be housed in a solid-walled one-piece structure or approved equal. Packing shall be EPDM material.
- i. Both ends of the shaft shall be integral with valve body.
- j. Seats bonded or mechanically fastened on the discs are not acceptable.
- k. Resilient seat material shall be Buna-N suitable for potable water or sewage or oil bearing liquids, and Viton or ethylene propylene terpolmer for air.
- l. Handwheel or chainwheel operators shall be gear operated with position indicator. Lever operators shall include lockout provisions.
- m. Buried valves shall have totally enclosed gear box with operator nut, valve box to finished grade, and extension stem. The gear housing shall have raised shoulder to fit valve box and exclude soil from entering valve box.
- n. Manufacturers.
 - 1) Pratt, Series 2FII Bonded Seat 3"-20" valves
 - 2) DeZurik BAW AWWA Butterfly Valves, 3"-20"
 - 3) Or equal

3. Cast Iron Body, Resilient Seated, Lug Style.

- a. Valve shall only be used for air piping.
- b. Body shall be of fully lugged construction.
- c. Pressure rating shall be 225 psi.
- d. Designed for bi-directional, drip tight shutoff up to a pressure of 150 psi.
- e. Designed for installation between ANSI 125 or 150 pound flanges.
- f. Flange holes shall be drilled to meet ANSI Class 125/150 dimensions.
- g. Seat shall be of a one-piece design, molded to the valve body to fully line the body interior and to isolate the body from the flow media.
- h. Disc shall be attached by the use of pins.
- i. Stem seal shall be provided with adjustable packing gland.
- j. Valve shall have body bearings to provide shaft support.
- k. Materials of Construction.
 - 1) Body: Cast Iron
 - 2) Disc Options: Ductile Iron
 - 3) Shaft: 416 Stainless Steel
 - 4) Seat: EPDM or Buna-N
 - 5) Body Bearings: Bronze
 - 6) Stem Seals: Same material as seat
- l. Manufacturers.
 - 1) DeZurik, BOS Lug Style
 - 2) Pike Industries
 - 3) Keystone, Model 222 Lug Style
 - 4) Or Equal

4. Anti-cavitation Trim.
 - a. Butterfly valves requiring anticavitation trim where indicated in the Valve Schedule shall include a stainless steel air distribution ring connected to the outside atmosphere via several radial holes in the valve flange.
 - b. Radial holes shall include isolation valves and an air/vacuum valve to prevent water from exiting the piping. The air/vacuum valve shall be as manufactured by Apco Valve and Primer Corporation or equal.
 - c. The trim shall admit air into the downstream side of the valve wherever low pressure exists.

F. Check Valves

1. Weight and Lever.
 - a. Cast iron body, bronze seat.
 - b. Seat shall be easily replaced without removing the valve from the line.
 - c. Disc shall be cast iron, suspended from a Type 316 stainless steel shaft.
 - d. The disc seat ring shall be resilient seated.
 - e. Flanged ends to fit 125 pound ANSI flanges.
 - f. Outside lever and weight that can be mounted on either side of valve, nonslamming and externally balanced.
 - g. Provide adjustable air closure on lever on valves larger than 6-inch diameter. Provide oil hydraulic, anti-slam closure device on all valves 12-inch and larger.
 - h. Drill and tap the bossed portion of the body of the valves and provide 304 stainless steel bracket for attachment of proximity switch on each valve to detect the closed position status of each valve. Provide a 115 VAC SPDT (N.C.) proximity switch with each valve.
 - i. All working parts removable through top of valve.
 - j. Valves 4 inches through 12 inches shall be rated for 175 psi working pressure, and valves 14 inches and larger shall be rated for 150 psi working pressure, unless noted otherwise.
 - k. Manufacturers.
 - 1) Clow/M&H
 - 2) American Flow Control
 - 3) Milliken
 - 4) Or equal
2. Rubber Flapper Swing Check.
 - a. Valves shall be full body type, with a domed access cover and only one moving part, the flexible disc.
 - b. Valves shall be provided with flanges in accordance with ANSI

B16.1, Class 125.

- c. The valve body shall be full flow equal to nominal pipe diameter at all points through the valve. The seating surface shall be on a 45 degree angle to minimize disc travel.
- d. The top access port shall be full size, allowing removal of the disc without removing the valve from the line. The access cover shall be domes in shape to provide flushing action over the disc.
- e. The disc shall be one piece construction, precision molded with an integral o-ring type sealing surface, and contain alloy steel and nylon reinforcement in the flexible hinge area.
- f. The valve body and cover shall be constructed of ASTM A536 Grade 65-45-12 ductile iron.
- g. The disc shall be precision molded Buna-N, ASTM D2000-BG.
- h. Valve shall have disc position indicator assembly.
- i. Manufacturers
 - 1) APCO
 - 2) Val-Matic
 - 3) Or equal

G. Corporation Stops

- 1. Type 1.
 - a. Standard. AWWA C800.
 - b. Material. Bronze.
 - c. End Connection.
 - 1) Inlet. AWWA taper thread
 - 2) Outlet. Threaded, inside iron pipe
 - d. Manufacturer and Model.
 - 1) Mueller Co., Model H10045
 - 2) Ford Meter Box Co., Model FB1600
 - 3) Or equal
- 2. Type 2.
 - a. Standard. AWWA C800.
 - b. Material. Bronze.
 - c. End Connection.
 - 1) Inlet. AWWA taper threaded
 - 2) Outlet. Flared copper
 - d. Manufacturer and Model.
 - 1) Mueller Co., Model H15000
 - 2) Ford Meter Box Co., Model FB600
 - 3) Or equal

H. Curb Stops

- 1. Type 1.
 - a. Standard. AWWA C800.
 - b. Material. Bronze.
 - c. End Connection.
 - 1) Inlet. Threaded, inside iron pipe

- 2) Outlet. Threaded, inside iron pipe
 - d. Manufacturer and Model.
 - 1) Mueller Co., Model Oriseal Mark II H10287
 - 2) Or equal
2. Type 2.
- a. Standard. AWWA C800.
 - b. Material. Bronze.
 - c. End Connection.
 - 1) Inlet. Flared copper
 - 2) Outlet. Flared copper
 - d. Manufacturer and Model.
 - 1) Mueller Co., Model Oriseal Mark II H15154
 - 2) Ford B22-666M
 - 3) Or equal

I. Gate Valves

1. 2-1/2 Inches and Smaller.
- a. Bronze Body.
 - 1) Minimum 125-psi working pressure
 - 2) All bronze, rising stem, double disc, or wedge type
 - 3) Handwheel operator
 - 4) Manufacturers
 - a) Crane
 - b) Or equal
2. 3 Inches and Larger.
- a. Iron Body, Double Disc.
 - 1) Shall be in conformance with AWWA C500
 - 2) Iron body, bronze mounted with bronze wedge and pin
 - 3) Full pipe area circular opening
 - 4) Minimum 150-psi working pressure, unless noted otherwise
 - 5) Valves with handwheel shall be outside screw and yoke type
 - 6) All valves without handwheels shall be nonrising stem type
 - 7) Manufacturers
 - a) American Darling
 - b) Or equal
3. Resilient Wedge.
- a. Iron Body.
 - 1) Shall be in conformance with AWWA C509
 - 2) Iron body, cast iron wedge with rubber seat permanently bonded to and encasing the wedge

- 3) Rubber bonding process in conformance with ASTM D 429
- 4) Rubber seat shall be polyurethane, SBR, or Buna-N, nick free, resilient, and abrasion resistant
- 5) Minimum 150-psi working pressure, unless noted otherwise
- 6) Valves with handwheel shall be outside screw and yoke type
- 7) All valves without handwheels shall be nonrising stem type
- 8) Manufacturers
 - a) American Darling
 - b) Or equal

J. Mud Valves

1. Stainless steel with resilient seats. Valves shall be non-rising stem type and heavy duty design.
 - a. The body flange, yoke, guides and gate shall be cast of type 316 stainless steel.
 - b. After machining, all castings shall be passivated in accordance with ASTM A-380. Valves which include components welded from stainless steel are not acceptable.
 - c. The resilient seat shall be of SBR rubber and mechanically retained. Resilient seats which are retained to the gate by adhesive or tension are not acceptable.
 - d. Fasteners shall be stainless steel.
 - e. The valve stem shall be one piece with an integral thrust collar and be cast or machined from type 316 stainless steel. Designs which pin a collar to the stem are not acceptable.
 - f. The valve stem shall have Acme threads with the minimum diameters as shown below:

Valve Size	Minimum Stem Diameter
4"	1-1/4"
6"	1-1/4"
8"	1-1/2"
10"	1-1/2"
12"	1-1/2"
16"	1-1/2"
18"	1-3/4"
20"	1-3/4"

- g. The valve shall be capable of withstanding a minimum input torque of 450 foot pounds, without damage to the valve. The valve shall not leak more than one quart per hour, when the valve is closed to a stem torque of 35 foot pounds. The manufacturer shall support leakage and torque testing with a report from an independent test laboratory.
- h. The stem shall be coupled to the extension stem with a stainless steel machined coupling or a cast stainless 2" square operating

nut and retained with a 5/16" stainless steel spring pin. No welded components of stainless are permitted for this connection or to the valve stem. Stems shall be retained with stainless fasteners assembled through holes drilled in the valve guide and yoke and retained with stainless hex nuts. Valve designs which retain the valve stem by threading stainless screws into tapped holes are not acceptable.

- i. The stem shall have a permanently bonded coating to prevent galling with other stainless components. The coating shall be safe for potable water use and capable of enduring a minimum of 15,000 open-close cycles without galling or excessive wear.
- j. The base flange shall be drilled per ANSI 125# standard and have a minimum thickness of 3/4". The base flange shall be machined to provide a smooth seating surface. Mud valves shall be as manufactured by Trumbull Industries, Youngstown, Ohio.
- k. The extension stem shall be type 316 stainless steel, of either schedule 40 pipe or solid round bar. The top nut and bottom couplings of the extension stem shall be either cast or machined from type 316 stainless steel, but not include any welded components.
- l. **Position Indication (Indicating Floorstand or Position Indicator)** The position of the mud valves, from fully open to fully closed, shall be visible at ground level, by means of either a position indicator or an indicating-type floorstand, as shown on the drawings.
- m. **Indicating Floorstand** (If a floorstand is shown on the drawings). The pedestal shall be cast of type 316 stainless steel and have a vertical indicating slot. The indicating slot shall be covered with a Lexan window and sealed. A bronze indicator shall travel on a threaded stem to indicate the position of the valve. The floorstand shall be operated by a 14" diameter handwheel of type 316 stainless. The word "OPEN" shall be cast in the pedestal at the top of the indicating slot. A "CLOSED" tag will be field mounted to the pedestal, to indicate the closed position of the valve. Floorstands fabricated by welding flanges to pipe shall not be accepted. The coupling used to connect the floorstand stem to the extension stem shall be stainless steel, type 316. Where a floor is not directly over the valve and extension stem, position indicators or floorstands shall be supported by a cast stainless wall bracket mounted to the side wall. Wall brackets shall contain a plate designed to support the floorstand.
- n. **Position Indicator** (If a floorstand is not shown on the drawings): Unless floorstands are shown on the drawings, position indicators shall be installed with all mud valves. An extension stem shall be provided by the manufacturer of the position indicator. The extension stem shall connect to a 2" square nut on the valve and extend up through the position indicator, terminating in a 2" square nut, operable by a standard waterworks tee handle wrench. The position of the valve, from fully open to fully closed, shall be easily identified at ground level. The movement of the indicating arrow shall be visible

through a window covering a minimum of 300 degrees of the circumference of the indicator. The scale plate shall be clear polycarbonate with characters and numerals that are a minimum of 3/16" to facilitate identification by the operator. Where a floor is not directly over the valve and extension stem, position indicators shall be supported by a cast stainless wall bracket mounted to the side wall. Wall brackets shall contain a plate designed to support the position indicator. Where there is a floor directly over the valve and extension stem, the position indicator shall be installed in a cast iron floor adapter. The adapter shall have internal opposing flat sides to match the flat sides of the position indicator, to prevent rotation of the position indicator during operation. The adapter shall be provided with a bronze bushing to support and center the extension stem. The bronze bushing shall be retained in the cast iron floor adapter by 2 stainless steel screws and drilled to an inside diameter 1/16" larger than the outside diameter of the extension stem. Where it is desirable to prevent foreign material from passing onto the position indicator or into the basin below, a debris shield shall be installed into the cast iron floor adapter. The debris shield shall be of non-corrosive material and designed to fit tightly inside of the cast iron floor adapter. The position indicator shall be of the planetary gear design. The sun gear, planet gear and ring gears will be constructed of non-corrosive Delrin. All Delrin components shall be white in color, to enhance visibility. The scale plate will be clear polycarbonate. Housings of carbon steel or aluminum will not be accepted. Fasteners shall be stainless steel. The top scale plate shall have markings representing the number of turns, contain the word "Closed", and a directional arrow. The markings shall be permanently recessed, embossed or engraved in the scale plate. The use of adhesive labels is not acceptable. The "open" line shall be marked on a transparent polycarbonate window, which will be field adjusted to the exact number of turns of each valve. After calibration, the position of the adjustable "open" window shall be secured to the top surface of the scale plate by the outside diameter of three stainless button head cap screws. Position indicators that are factory calibrated without the valve, rather than calibrated to the valve they are used with, are not acceptable (If a floorstand is not shown on the drawings): Unless floorstands are shown on the drawings, position indicators shall be installed with all mud valves. An extension stem shall be provided by the manufacturer of the position indicator. The extension stem shall connect to a 2" square nut on the valve and extend up through the position indicator, terminating in a 2" square nut, operable by a standard waterworks tee handle wrench. The position of the valve, from fully open to fully closed, shall be easily identified at ground level. The movement of the indicating arrow shall be visible through a window covering a minimum of 300 degrees of the circumference of the indicator. The scale plate shall be clear polycarbonate with characters and numerals that are a minimum of 3/16" to facilitate identification by the operator. The position

indicator shall be sealed with (2) Neoprene O-rings. The position indicator shall not admit more than 0.5 ounce of water, after 7 days of submergence. The position indicator shall be cycle tested by the manufacturer, to insure successful operation of 1 million revolutions. Drop testing shall be performed by dropping an 18 # weight from 4 feet, to insure accidental impact will not crack or damage the position indicator. The manufacturer shall support submergence, cycle and impact testing with a report from an independent test laboratory.

- o. **Stem Guides:** Stem Guides shall be constructed of cast stainless steel, type 316. Stem guides fabricated by welding stainless steel shall not be permitted. Stem guides shall include a bronze bushing with an inside diameter 1/16" larger than the outside diameter of the extension stem and shall be retained with two stainless steel screws. The stem guide shall be of the adjustable design for plumb alignment. The adjusting bolt and washer shall be type 316 stainless. Stem guides shall be spaced so that the unsupported length between extension stems shall not exceed 7 feet. Mud valves shall be operated with extension stems, stem guides and either position indicators or indicating floorstands, as shown on the valve schedule or drawing.
- p. Provide Stem guide with Handwheel.
- q. Manufacturer.
 - 1) Trumbull
 - 2) Troy Valve
 - 3) Or equal

K. Plug Valves

1. Eccentric, nonlubricated. (Water, NPW, Sump Discharge)
 - a. Body shall be iron or semisteel.
 - b. Valves rated for 150 psi working pressure unless noted otherwise in the Valve Schedule or on the drawings.
 - c. Port opening shall not be less than 80 percent of full pipe area.
 - d. Buna-N coated, tight sealing plug.
 - e. Buna-N seats, except Viton or ethylene propylene terpolymer (EPT) for air service.
 - f. Top and bottom bearings of noncorrosive material.
 - g. All buried valves and valves 6 inches and larger shall have enclosed gear operators.
 - h. Manufacturers.
 - 1) Clow
 - 2) DeZurik
 - 3) Homestead
 - 4) Or equal
2. Full Port (Wastewater and Sludge)
 - a. Body and Cover. Valve bodies and covers shall be cast iron ASTM A 126, Class B.
 - b. Valves rated for 150 psi working pressure unless noted otherwise in the Valve Schedule or on the drawings.
 - c. Plug. Valve plugs shall be cast ASTM A 126, Class B or ductile iron. The entire plug face shall be covered with Buna N rubber compound.
 - d. Seat Ring. Seat rings shall be solid, one-piece, raised surface seat of welded nickel or 304 stainless steel to conform to plug face.
 - e. Packing. Multiple ring v-type packing material shall be self-adjusting and renewable.
 - f. Bearings. Sleeve type bearings shall be utilized in both the upper and lower trunnions. Bearing material shall be stainless steel or PTFE phenolic backed Teflon.
 - g. Manufacturer.
 - 1) Dezurik Model PEF 100% Port Eccentric Plug Valve
 - 2) Valmatic Model 5600R (Flanged) or 5700R (MJ)
 - 3) Or equal

L. Pressure-Reducing Valves

1. Pressure-reducing valves shall be hydraulically operated, pilot controlled, diaphragm type globe valve.
 - a. Valve shall maintain an adjustable downstream pressure regardless of fluctuations in flow rate and shall close tight when a pressure reversal occurs.
 - b. Valve shall have a single removable seat and resilient disc.

- c. Pilot control shall be direct acting, adjustable, spring loaded, normally open diaphragm valve, designed to permit flow when controlled pressure is less than spring setting.
- d. Valve shall have iron body with bronze trim.
- e. Manufacturers.
 - 1) Watts
 - 2) Fischer
 - 3) Or equal

M. Pressure Relief Valves (PRV)

- 1. Hydrostatic.
 - a. Valves shall be designed to operate on a hydrostatic differential.
 - b. Floor type valves shall be cast iron body with resilient seat.
 - c. Wall type valves shall be flanged, Stainless steel body, bronze mounted, with resilient seat.
 - d. Valves shall come complete with corrosion resistant strainer, strainer plug, and tapped flange wall pipe.
 - e. Manufacturers.
 - 1) Clow
 - 2) Trumbull
 - 2) Or equal

N. Yard Hydrants

- 1. Type 1 - Nonfreeze, Post Type, Hydrants with 2-inch Hose Nozzle.
 - a. Connection.
 - 1) 2-inch iron pipe straight inlet thread, universal type
 - 2) 2-inch outlet thread nozzle, 11-1/2 threads per inch
 - b. Materials.
 - 1) Stock and Base. Cast iron
 - 2) Top, Slide, and Handle. Cast iron
 - 3) Nozzle, Nipple, Screw, and Tee. Brass
 - 4) Valve Body, Stem, and Ring. Brass
 - 5) Washers. Leather
 - c. Required Features.
 - 1) Handle. Ball wheel
 - 2) Field serviceable without digging up hydrant
 - 3) 2-inch size Andrews cam and groove, male adapter with 2-inch female end threaded with National Pipe Taper Threads, 11-1/2 threads per inch. Male adapters shall be brass, Type A, part No. 200-A, as manufactured by the Dixon Valve and Coupling Company. Provide and install one male adapter on each yard hydrant installed.
 - 4) 2 inch Andrews can and groove, reducing coupler, with 1 1/2 inch male end threaded with American Standard Taper Threads, 11-1/2 threads per inch. Reducing coupler shall be aluminum, part No. 2015-B, as manufactured by Dixon Valve and Coupling Company. The male threads shall be compatible with 1-1/2-inch iron pipe hose threads, 11-

- 1/2 threads per inch. Provide one reducing coupler for every yard hydrant installed.
- d. Depth of Bury. As shown on drawings.
 - e. Manufacturer and Model.
 - 1) For Flushing Water. Murdock Model M-200
 - 2) Or equal

2.3 OPERATORS

A. Manual

- 1. Shall be enclosed gear or traveling nut type as noted in the Valve Schedule with no external moving parts.
- 2. Operating force shall not exceed 40 pounds.
- 3. Provide chainwheel operators on manually operated valves more than 60 inches (1500 mm) above floor. Extend chains to 36 inches (900 mm) above finished floor elevation. Where valves are above aisles, provide 1/2-inch stainless steel hook bolt to tie chains to sides to keep chain out of walking area. See Paragraph 2.4. J Chainwheel Operators in this specification for additional requirements.

B. Electrical

- 1. General. The electric operators shall conform to the following specifications. The operator shall be the open or close only type (O/C) or modulating type (MOD) as specified. Modulating type operators shall be designed to hold the valve in the intermediate position between fully open and fully closed without creeping or fluttering.
- 2. Drive Motor. Drive motor shall be of sufficient size to open or close valve against maximum differential pressure when voltage to the motor terminals is 90 percent of nameplate rating. Electric actuators shall be sized to provide one and one-half times the maximum torque required to operate the gate or valve. Drive motor shall be specifically designed for operator service and shall be of totally enclosed, nonventilated construction, with permanently lubricated ball bearings. Drive shall have Class F insulation. The drive motor shall be provided with a thermostatically controlled heater. The power source to the motor shall be 480 volt, 3 Phase or as shown on Contract Drawings. Note: Flow Control Valves for the Diffused Aeration Header Drops, and the NPW Flush Valves in the Ejector Tunnels) will be 120 VAC, 1 Phase). Provide thermal switches, embedded in motor windings to protect against overheating. Provide NEMA 4X enclosure.
- 3. Limit Switches. Limit switches and the limit switch drive mechanism shall be an integral part of operator. Limit switches shall be adjustable, allowing for trip points from fully open to fully closed positions of valve travel. Limit switches shall be geared to, and actuated by, the driving mechanism whether in motor drive or manual (handwheel) operation. Operator shall have provisions for mounting at least eight (four N.O., four N.C.) additional limit switches which shall be housed in an integral housing to the operator. Limit switch compartment to have no exposed electrical connections. Use proximity style limit switches wherever possible. Provide a NEMA Type 4X enclosure.
- 4. Torque Switches. Each operator shall have an opening torque switch and a closing torque switch. Torque switches shall have a range of adjustment and be responsive to

opening or closing loads such that switches operate to protect valve and operator from damage when there is valve obstruction during opening or closing.

5. Handwheel and Declutching Mechanism. Declutching mechanism shall operate valve by means of permanently attached auxiliary handwheel. Declutch assembly and handwheel may be used to operate valve when electrical power is not available. Handwheel shall require no more than 40 pounds of rim pull. Actuation of motor shall automatically return the operator to the electric mode. Handwheel is not to rotate while operator is in the electric mode. Electric mode can be overridden locally by holding declutch lever down and rotating handwheel manually.
6. Motor Controller. A NEMA or IEC rated reversing motor controller with either overload relays in each phase or a thermal relay responsive to motor winding temperature, or both, shall be provided. Each opening and closing contactor shall be equipped with auxiliary contacts and mechanical linkages such that controller shall be electrically and mechanically interlocked. Controller shall be completely wired to 600 volt terminal blocks or plug assemblies in a minimum NEMA 4X or ingress protection (IP) 65 rated housing which is integral to operator. Valve travel time shall be 60 seconds from the fully open to fully closed position. All internal wiring in the housing shall be to terminal strips or plug assembly, and all limit and torque switches shall be wired to these terminals. Include a control transformer with a minimum volt-ampere rating of 2.5 times the volt-ampere load of the motor contactor coil. The control transformer shall have fuse protection on the primary and secondary side circuits.
7. Open-Close Operators (O/C). The valve control shall be provided with local selector switches or push buttons (Open/Stop/Close) and (Remote/Off/Local) and two indicating lights for Open (Red) and Closed (Green) position. Lights shall be lit in the mid travel position and shall be LED type.
8. The local switches shall be provided on the limit switch compartment. A mechanical dial for local position indication shall be provided.
9. Modulating Requirements. Modulating operators shall include a proportional position servo amplifier. The proportional position servo amplifier shall be designed to accept a 4-20 milliamperes direct current (mA_{dc}) input signal. The unit shall contain the following control functions.
 - a. Span. This function shall calibrate the position feedback potentiometer to cause the full rotation of the output shaft to correspond to the full 0 to 100 percent range of the signal from the set point controller.
 - b. Zero. This function shall calibrate the position feedback potentiometer to cause the travel of the output shaft to be properly centered.
 - c. Gain. This function shall control the rate at which the motor speed increases as the error signal increases.
 - d. Dead Band. This function shall control the magnitude of error signal that occurs before the motor begins to rotate to prevent hunting.

The control module shall be furnished with two feedback potentiometers for use in balancing the control circuit and for remote indication. The position feedback

potentiometer shall be provided with antibacklash gearing or shall be operated directly from the valve shaft as required to minimize hysteresis to within 1 degree. Modulating type electrically operated valve shall include valve position transmitter. The output signal from the valve position transmitter shall be 4-20 mA dc. The valve control shall be provided with selector switches to allow local open/close operation or automatic modulating control from the remote 4-20 mA dc signal. The selector switches shall be provided on the limit switch compartment. A mechanical dial for local position indication shall be provided.

10. Local Controls. The valve control shall be provided with local switches for local/remote and open/stop/close operation. The local switches shall be provided on the limit switch compartment. A mechanical dial for local position indication shall be provided.
11. Gear Box Assembly. Gear box is to be completely filled with lubricant, allowing operator to be installed in any position. Operator design shall accommodate removal of motors without loss of lubrication.
12. Actuators shall be Limitorque Type MX, Rotork IQ, or equal.
13. Manufacturer.
 - a. Rotork - Model IQ (Multi-turn or IQT Quarter Turn Valves)
 - b. E.I.M.
 - c. Limitorque.
 - d. Bettis.
 - e. Or equal.

2.4 ACCESSORIES (All Valves Except Sluice Gates)

A. Valve Boxes

1. All buried valves shall be provided with valve boxes.
2. Valve boxes shall be standard, adjustable, heavy pattern, cast iron extension type, three piece, screw type, and with 5 1/4 inch inside diameter.
3. Valve boxes shall be of sufficient length to extend from valve to finished grade. Provide extension stems, guides, and floor stands where required.
4. Tops shall be set at established grades and valve box cover shall be marked with pipe function.

Valve Size	Base
4" and smaller	round, 8" in height, 10-7/8" diameter at bottom
6" and 8"	round, 11" in height, 14-3/8" diameter at bottom
10" through 16"	oval, 9-1/2" in height, 21" by 12-1/2" diameter at bottom
18" and 20"	oval, 10" in height, 25-1/2" by 16" diameter at bottom
24"	dome, 5" in height, 15" diameter and 17" square

flange at bottom

B. Curb Boxes

1. Type 1.
 - a. Type. Cast iron, extension type, Minneapolis Pattern.
 - b. Size. Inside diameter of upper section shall be 2 inches.
 - c. Provide stationary rod, lid, and plug.
 - 1) The stationary rod shall extend to 6 inches below finish grade
 - d. Manufacturer.
 - 1) Mueller H-10304
 - 2) Or equal
2. Type 2.
 - a. Type. Cast iron, Buffalo type.
 - b. Size. Inside shaft diameter shall be 2 1/2 inches.
 - c. Provide lid.
 - d. Manufacturer.
 - 1) Mueller H-10350, size 93-E
 - 2) Star 94E
 - 3) Or equal

C. Floor Boxes

1. Floor boxes shall be cast or ductile iron construction with cover.
2. Floor boxes shall be of the bronze bushing type.
3. Boxes shall be designed for installation in floors and slabs as shown.
4. Include with all valves where operating nut is at concrete slab.

D. Floor Stands

1. Floor stands shall be cast iron or ductile iron, right angle type, crank operated, straight or offset as required, and rigidly anchored, and shall include position indicator for open and field set full close position.
2. Floor stands shall be nonrising type unless noted otherwise.
3. Operators shall turn counterclockwise to open.
4. Single or double gear reduction shall be provided as required.
5. Antifriction bearings shall properly support both opening and closing thrust to floor stand.
6. Floor stand shall operate the valve or gate under all operating conditions with 40 pound maximum pull on the crank.
7. All components shall be enclosed in a cast iron or ductile weatherproof housing with positive mechanical seals to exclude moisture and dirt and prevent lubricant leakage.
8. Lubrication fittings shall be furnished for all gears and bearings.
9. Floor stand pedestal shall position the input shaft approximately 30 inches above the base.
10. A permanently attached or cast arrow with the word "OPEN" on the floor stand shall be furnished indicating the direction of rotation to open the valve or gate.
11. Floor stands shall be suitable for occasional submergence.

E. Extension Stems

1. Constructed of extra strength steel rod for buried valves and Type 304 stainless steel rod for the stems inside structures and buildings.
2. Length shall be as required for proper operation of the valve or as specified in the valve schedule.
3. Extension stems shall be securely fastened to the valve stem.
4. Extension stems for buried valves shall extend to within 3 1/2 feet of finished grade unless noted otherwise.

F. Stem Guides

1. Constructed of cast iron or stainless steel with bronze bushing.
2. Guide shall be of adjustable design for plumb alignment.
3. Guide shall be complete with stainless steel anchor bolts.
4. Spacing as required to support stem but shall not exceed 8 feet.

G. Operating Nuts

1. Operating nuts shall be provided for all valves and as called for in the Valve Schedule.
2. All buried valves shall have cast iron or ductile iron operating nuts.
3. All operating nuts shall be 2 inches square.

H. Lever Type Operators

1. For valves located less than five feet above operating floor, provide levers on 4-inch diameter or smaller, quarter-turn valves, and provide handwheels on all other valves, unless otherwise shown or specified.
2. Lever operators are only applicable to manual operation of one-quarter valves under 4-inch diameter that satisfy maximum allowable 40 pound pull force needed to unseat and operate valve. Lever shall be capable of being fixed in any intermediate position.

I. Handwheel Operators

1. Conform to applicable AWWA standards.
2. Material of Construction: Ductile iron, or cast aluminum.
3. Arrow indicating direction of opening and word "OPEN" shall be cast on trim of handwheel.
4. Maximum handwheel diameter: 2.5 feet.
5. Manual operators shall be enclosed gear or traveling nut type with hand wheel as noted in the Valve Schedule with no external moving parts.
6. Operators shall be sized for 40 pound pull force.
7. Provide chainwheel and chain for valves where centerline of valve stem is greater than five (5) feet above floor.

J. Chainwheel Operators

1. Install chainwheel operators on manually operated valves more than 60 inches (1500 mm) above floor. Extend chains to 36 inches (900 mm) above finished floor elevation.

Where valves are above aisles, provide 1/2-inch stainless steel hook bolt to tie chains to sides to keep chain out of walking area.

2. Chainwheel and chain guides shall be cast from Type 316 investment casting stainless steel and passivated in accordance with ASTM A-389 after burrs and sharp edges are removed. Chainwheel shall be recessed groove, pocket type made out of Type 316 stainless steel. Chainwheel shall be direct mounting to valve stem with adapter or pinned to valve stem.
3. Provide welded link chain of Type 316L stainless steel with smooth. Chain that is crimped or has links with exposed ends is unacceptable.
4. Provide geared operators where required to position chainwheels in vertical.
5. Provide secondary restraint to protect personnel operating an overhead valve in the event the chainwheel should separate from the valve and fall to the ground. The components shall be 316 SS including eyebolt, wire rope cable, and cable clips. A locking jam nut shall secure an eyebolt threaded into the top half of the chainwheel guide. Manufacturer shall provide test results demonstrating the restraint shall be capable of supporting 200 pounds from a fall of 4 feet above. Restraint shall be manufactured by Trumbull Industries, Youngstown, Ohio, or approved equal.

K. Valve Wrenches

1. Wrenches shall be of T-bar design with socket.
2. Length shall be sufficient to comfortably operate valves.
3. See Valve Schedule for quantity but provide at least one fixed bar type and one sliding bar type for close quarters.

L. Hose Stations Assemblies

1. Rubber Multi-purpose Hose:
 - a. Rubber shall be premium quality multipurpose Nitrile hose that is recommended for abusive industrial applications in diameters and lengths as shown on plans. Hose shall be oil resistant, suited for potable water applications.
 - b. Rubber hose shall be reinforced with spiral synthetic yarn to provide excellent kink resistance. Reinforced for excellent kink and abrasion resistance, and suited for use in ambient air temperatures of -20F to 190F.
 - c. Length of hose shall be 50 ft unless noted otherwise.
 - d. Manufacturers: Hose Craft, Reelcraft, Flexcraft or equal.
2. Wall Mount Hose Holder Bracket:
 - a. Provide heavy duty wall bracket for holding specified amount of hose. Provide 316 stainless steel anchor bolts and fasteners to attach holder to wall, and be twice the weight of the hose materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspection

1. Verify job conditions and intended valve service before ordering each valve.
2. Inspect for damage to valve resulting from shipping and handling prior to installation.

3. Remove debris from inside piping system before installation.

3.2 PREPARATION

A. Handling

1. Handle valves and accessories with care.
2. Comply with the manufacturer's instructions.

3.3 INSTALLATION

A. Procedures

1. Install in accordance with manufacturer's instructions.
2. Install operators for most convenient access. All valve operator access shall be located only after coordinated with the Owner's operation personnel and the Engineer/Architect.
3. Install plumb and level.
4. Install free from distortion.
5. Install with proper support and restraint.

3.4 FIELD QUALITY CONTROL

A. Inspection

1. Verify conformance with manufacturer's shop drawings.
2. Verify conformance with manufacturer's instructions.
3. Report defects in workmanship, materials, and performance.

3.5 ADJUSTING

A. Procedures

1. Follow manufacturer's instructions.
2. Adjust stops and friction clamps for proper operation.

3.6 DEMONSTRATION

A. General

1. Demonstrate proper operation under actual service conditions.
2. Valves that have moving internal mechanisms designed to operate without manual operation shall have functions demonstrated for a minimum of three repeat cycles. This includes air release valves, air and vacuum breaker valves, pressure reducing valves, back pressure valves, check valves, pressure relief valves, surge anticipator, and surge relief valves.
3. All valves shall be demonstrated to not leak under maximum design operating pressures when operated for a minimum of three repeat cycles of open and close during the operational demonstration period.

3.7 MAINTENANCE

A. Contractor's Responsibility

1. Conform to manufacturer's recommended procedures.
2. Provide initial lubrication and maintenance.
3. Perform maintenance until the installation is accepted by the Owner.

PART 4 - VALVE SCHEDULE

- 4.1 **GENERAL.** The Valve Schedule is for the convenience of the Contractor and the omission of any valve does not release the Contractor from the responsibility to furnish and install all the valves required by the drawings.
- 4.2 **SIZES.** Only valves 3 inches and larger are included in the Valve Schedule. Valves integral to or specified with other equipment, valves bid as part of unit price items, and valves to be furnished under plumbing, heating, or other sections of the specifications are not included.
- 4.3 **VALVE WRENCHES.** Provide six valve wrenches. Three wrenches shall be fixed bar type and three shall be sliding bar type.
- 4.4 **ABBREVIATIONS**

A. Valves and Gates

AG	Angle Valve
AR	Air Release
AV	Air and Vacuum Valve Assembly
BA	Ball Valve
BF	Butterfly Valve
CK	Check Valve
CA	Combination Air Valve
CS	Curb/Corporation Stop
FM	From Equipment Manufacturer
GA	Gate Valve
MU	Mud Valve
PRV	Pressure Relief Valve
PL	Plug Valve
SI	Slide Gate
SL	Sluice Gate
TS	Telescoping Valve
TV	Tapping Valve

B. Operators

CW	Chainwheel
EL	Electric
ES	Extension Stem
HC	Hand Crank
HW	Hand Wheel
HY	Hydraulic

LE	Lever
LW	"L" Wrench
ON	Operating Nut
PN	Pneumatic
FS	Floor Stand

C. Ends

FL	Flange
GR	Grooved
LG	Lug
MJ	Mechanical Joint
PO	Push On
SC	Screw
WF	Wafer

4.5 VALVE SCHEDULE

A. Not Used

END OF SECTION

(SAMPLE COPY)
Waste Disposal Agreement for Projects in the City of Canton

Items 1, 3 - 9 are optional and discretionary to the undersigned

THIS WASTE AGREEMENT, made this _____ day of _____ 20____, by and between _____ (called "Contractor"), and _____ of _____ (called "Land Owner"), concerning a certain construction contract between the Contractor and _____ in the City of Canton, OH for the _____ (project), as follows:

1. **MANNER OF WASTING:** Land Owner grants to Contractor the exclusive right to place dirt, earth, rock, topsoil, subsurface, unsuitable and/or other excess material (called "waste material") upon the area described in the following paragraph without requirement, limit, or restriction as to depth, amount, manner, or time.
2. **WASTE AREA:** The property upon which Contractor is permitted to place material is commonly known as _____ (address).
3. **TITLE TO WASTE AREA:** The Land Owner warrants that it has title to and the right to contract for placement of waste material in said area and agrees to defend and indemnify Contractor against any claim, suit, or damage arising out of such title or right to contract.
4. **ACCESS AND USE:** Land Owner hereby grants Contractor the right of ingress and egress to the waste area in locations to be selected by Contractor for all purposes necessary to the complete fulfillment of this agreement, and the right of quiet enjoyment in the intended use of such area.
5. **PAYMENT:** Contractor agrees to pay and Land Owner agrees to accept as full and final compensation for all rights granted and covenants contained herein and all claims of every nature the sum of _____ payable
6. **BASIS OF MEASUREMENTS:** It is mutually agreed that measurement of the amount of materials wasted, where required, shall be made on the following basis: _____ and said measurement shall be binding upon the parties hereto for all purposes.
7. **DAMAGES:** Land Owner hereby waives any and all claims for damage to the waste area and to the area of ingress and egress except as specifically noted herein.
8. **RELEASE:** Upon receipt of final payment hereunder, and provided all terms of this agreement have been fulfilled, Land Owner hereby releases Contractor from further liability of any kind or nature hereunder.

WITNESSES:

CONTRACTOR:

Authorized Signature & Title

LANDOWNER:

Signature

9. **ENTIRE AGREEMENT:** It is agreed that the terms and conditions of this agreement are fully covered in the foregoing, and that any oral or written statements made by either party, or agents claiming to represent either party, not set forth herein, are not binding on the parties and are not considered as part of this Agreement.
10. **DISCLAIMER:** The City of Canton is not a party to the here above agreement. The Contractor and Landowner shall indemnify and save harmless the City of Canton from any claim that may arise from the here above agreement. The waste material is the property of the Contractor, not the City of Canton.

Appendix C

CITY OF CANTON, OHIO

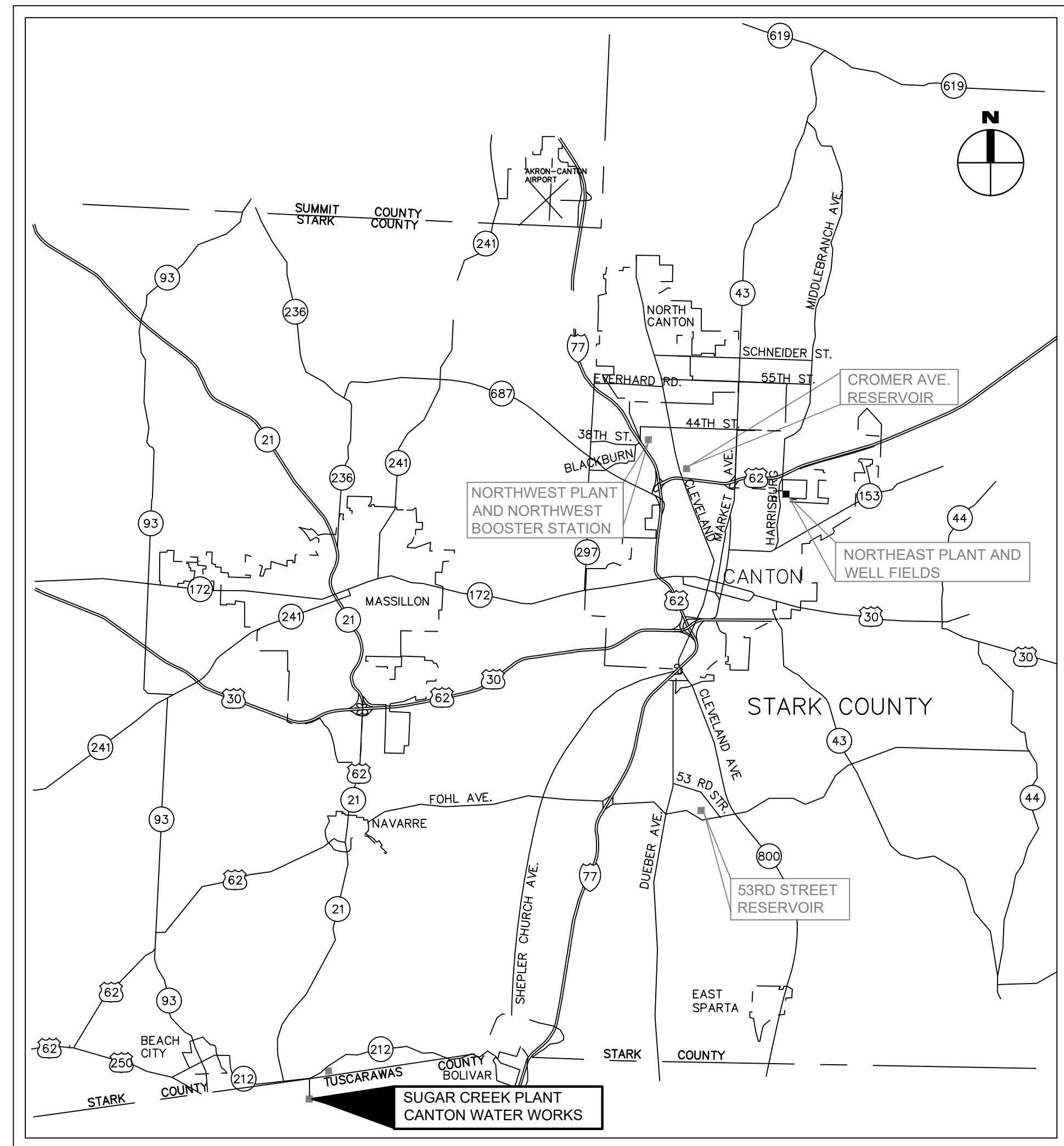
SUGAR CREEK WATER TREATMENT PLANT

FILTER BACKWASH DECHLORINATION FACILITY

JANUARY 2021

BURGESS & NIPLE
100 WEST ERIE STREET
PAINESVILLE, OHIO 44077

CITY OF CANTON
SUGAR CREEK
WATER TREATMENT PLANT
FILTER BACKWASH
DECHLORINATION FACILITY



LOCATION MAP

SUGAR CREEK WATER TREATMENT PLANT
9520 DOLPHIN STREET
STATE ROUTE 212
STRASBURG, OH
TUSCARAWAS COUNTY

CANTON CITY OFFICIALS:

MAYOR: THOMAS M. BERNABEI
DIRECTOR OF PUBLIC SERVICE: JOHN HIGHMAN
CANTON WATER DEPT. SUPERINTENDENT: TYLER S. CONVERSE


MEMBERS OF CANTON CITY COUNCIL:

COUNCIL PRESIDENT	WILLIAM SHERER II
WARD 1	GREG HAWK
WARD 2	BRENDA KIMBROUGH
WARD 3	JASON SCAGLIONE
WARD 4	CHRIS SMITH
WARD 5	ROBERT FISHER
WARD 6	KEVIN HALL
WARD 7	JOHN MARIOL II
WARD 8	PETE FERGUSON
WARD 9	FRANK MORRIS
AT LARGE	BILL SMUCKLER
AT LARGE	JAMES BABCOCK
AT LARGE	CHRISTINE SCHULMAN

INDEX OF SHEETS	
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3	GENERAL NOTES
4	DECHLORINATION BUILDING LOCATION PLAN AND GRADING
5	CHEMICAL FEED LINE, PROCESS FLOW DIAGRAM, HYDRAULIC PROFILE
6	PROCESS DECHLORINATION BUILDING
7	ARCHITECTURAL ELEVATIONS
8	STRUCTURAL STD CONC DETLS, GEN NOTES, DESIGN CRITERIA
9	STANDARD CONCRETE DETAILS
10	STANDARD PROCESS PIPING DETAILS
11	MISCELLANEOUS STRUCTURAL AND ARCHITECTURAL DETAILS
12	STATEMENT OF SPECIAL INSPECTIONS
13	MISCELLANEOUS SITE DETAILS
14	SITE GRADING AND PAVEMENT DETAILS
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E-2	ELECTRICAL SITE PLAN AND DETAILS
E-3	ELECTRICAL LIGHTING PLAN, WIRING DIAGRAMS, AND SCHEDULES

PLAN APPROVALS:

THIS PROJECT IS APPROVED BY THE CITY OF CANTON WATER DEPARTMENT THIS 14 DAY OF January, 2021.


TYLER S. CONVERSE,
WATER DEPARTMENT SUPERINTENDENT
P.O. BOX 7904
2664 HARRISBURG ROAD NE
CANTON, OHIO 44705

PLANS PREPARED BY:


CARL M. SEIFRIED, P.E./OHIO E-38583
DATE: January 15, 2021

UNDERGROUND UTILITIES
CONTACT BOTH SERVICES
CALL TWO WORKING DAYS
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1-800-362-2764
(TOLL FREE)

OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY

OIL & GAS PRODUCERS PROTECTIVE
SERVICE CALL: 1-800-925-0988

NO.	DESCRIPTION	DATE

JOB NO: PR58982
DATE: JAN. 2021
DESIGNED BY: CMS
DRAWN BY: GCB
CHECKED BY: CMS
APPROVED BY: CMS
SCALE: NONE

TITLE SHEET

ABBREVIATIONS

ADF	AVERAGE DAILY FLOW	MGD	MILLION GALLONS PER DAY
AGG.	AGGREGATE	MH	MANHOLE
APPROX.	APPROXIMATE	MFR.	MANUFACTURE(ER)
ASPH.	ASPHALT	MTL.	MATERIAL(S)
AVR	AIR VACUUM RELEASE VALVE	MAX.	MAXIMUM
B OR B/L	BASE LINE	MECH.	MECHANIC(AL)
BM	BENCH MARK	MJ	MECHANICAL JOINT
BIT.	BITUMINOUS	MGD	MILLION GALLONS PER DAY
BLK.	BLOCK	MIN.	MINIMUM
BPV	BACKPRESSURE VALVE	MISC.	MISCELLANEOUS
BLKG.	BLOCKING	N	NORTH OR NORTHING
BLDG	BUILDING	NaHSO3	SODIUM BISULFITE
BV	BALL VALVE	NE	NORTHEAST
		N.T.S.	NOT TO SCALE
		NW	NORTHWEST
CI	CAST IRON	O.D.	OUTSIDE DIAMETER
C.I.P.CONC.	CAST-IN-PLACE CONCRETE	OC	ON CENTER
CB	CATCH BASIN		
CEM.	CEMENT	PNT.	PAINT(ED)
CL	CENTERLINE	PVMT.	PAVEMENT
C-C OR C/C	CENTER TO CENTER	PE	PEDESTAL
CLD	CENTERLINE DITCH	PKF	PK NAIL FOUND
CLR	CLEAR	PKS	PK NAIL SET
CONC.	CONCRETE	PT.	TANGENT POINT
CMP	CORRUGATED METAL PIPE	PE	POLYETHYLENE OR PLAIN END
CMU	CONCRETE MASONRY UNIT	PVC	POLYVINYL CHLORIDE
CONN.	CONNECTION	PVCO	POLYVINYL CHLORIDE MOLECULARLY ORIENTED
CONST.	CONSTRUCTION	PCF	POUNDS PER CUBIC FOOT
CONT.	CONTINUOUS	PLF	POUNDS PER LINEAL FOOT
CO	CLEAN OUT	PROP.	PROPOSED
CPVC	CHLORINATED POLYVINYL CHLORIDE	PRV	PRESSURE REDUCING VALVE
CFM	CUBIC FEET PER MINUTE	PSF	POUNDS PER SQUARE FOOT
CFP	CHEMICAL FEED PUMP	PSI	POUNDS PER SQUARE INCH
CF	CUBIC FOOT	P/L OR PL	PROPERTY LINE
CY	CUBIC YARD	RCP	REINFORCED CONCRETE PIPE
CTS	COPPER TUBING SIZE	REQ'D	REQUIRED
CV	CHECK VALVE	RPBP	REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY
DET.	DETAIL	R/W	RIGHT OF WAY
DIA.	DIAMETER	S	SOUTH
DIM.	DIMENSION	SAN	SANITARY SEWER
D.T.	DRAIN TILE	SE	SOUTHEAST
DWL'S	DOWELS	SHT.	SHEET
DWG.	DRAWING	SPEC.	SPECIFICATION(S)
DR.	DRIVE OR DIMENSION RATIO	SWLK	SIDEWALK
DI	DUCTILE IRON	SQ.	SQUARE
DIP	DUCTILE IRON PIPE	SF	SQUARE FEET
		SY	SQUARE YARD
E	EAST OR ELECTRIC OR EASTING	SS	STAINLESS STEEL
EA	EACH	STD.	STANDARD
EASE	EASEMENT	STA.	STATION
EF	EACH FACE	S.D.	STORM DRAIN
ELEC.	ELECTRIC(AL)	STS	STORM SEWER
EL. OR ELEV.	ELEVATION	SW	SOUTHWEST
EOC	EDGE OF CURB	TEL.	TELEPHONE
EOP	EDGE OF PAVEMENT	TEMP	TEMPORARY
EQPT.	EQUIPMENT	THK.	THICK(NESS)
EW	EACH WAY	TOC.	TOP OF CASTING
EWH	ELECTRIC WATER HEATER	TYP.	TYPICAL
EX. OR EXIST	EXISTING	T&B	TOP AND BOTTOM
EXP	EXPANSION	UGT	UNDERGROUND TELEPHONE
EXT.	EXTERIOR	UGE	UNDERGROUND ELECTRIC
		U.N.O.	UNLESS NOTED OTHERWISE
FO	FIBER OPTIC	VIT. OR VCP	VITRIFIED CLAY PIPE
FRP	FIBRE-REINFORCED PLASTIC	V	VERTICAL
FT	FEET OR FOOT	VTR	VENT THROUGH ROOF
FH	FIRE HYDRANT	W	WEST/WIDTH
FPVC	FUSIBLE POLYVINYL CHLORIDE	WG	WATER GAGE
		WH	WATER HEATER OR WALL HYDRANT
GAL	GALLON	WTR	WATER
GPM	GALLONS PER MINUTE	W/L	WATERLINE
GPH	GALLONS PER HOUR	WM	WATER MAIN
G	GAS	W/S	WHITE STRIPE
GT	GAS TEST	W/	WITH
GEN	GENERAL	W/O	WITHOUT
GR OR GRAV	GRAVEL	YH	YARD HYDRANT
HDD	HORIZONTAL DIRECTIONAL DRILL		
H	HEIGHT		
HDPE	HIGH DENSITY POLYETHYLENE		
HOR.	HORIZONTAL		
HP	HORSEPOWER OR HIGH POINT		
HPPP	HIGH PRESSURE PETROLEUM PRODUCTS PIPELINE		
HSE	HOUSE		
I.D.	INSIDE DIAMETER		
INSUL.	INSULATE		
INT.	INTERIOR		
INV.	INVERT		
IP	IRON PIN		
IPS	IRON PIN SET		
IPF	IRON PIN FOUND		
L	LENGTH		
LB	POUND		
LF	LINEAL FEET		

SYMBOLS

	EXISTING FENCE		GAS MARKER
	RIGHT-OF-WAY		WATER MARKER, WATER METER
	PROPERTY LINE, PROPERTY PIN		ELEC. PULL BOX, ELEC. PED. BOX
	EXISTING UNDERGROUND TELECOMMUNICATIONS		LAMP POST, GROUND LIGHT
	EXISTING UNDERGROUND ELECTRIC		GUY WIRE, CABLE POLE
	OVERHEAD ELECTRIC		POWER POLE
	GUARDRAIL		IRON PIN FOUND, BENCH MARK
	EXISTING GAS LINE, GAS METER, GAS SERVICE VALVE		MAILBOX, SIGN
	EXISTING STORM SEWER, CATCH BASIN, MANHOLE		TREE, BUSHES
	EXISTING LARGE DIAMETER STORM SEWER CROSSING		TELECOMMUNICATIONS PEDESTAL
	EXISTING SANITARY SEWER AND SANITARY MANHOLE		MAIL BOX
	EXISTING WATERLINE, FIRE HYDRANT, SERVICE WITH SERVICE VALVE, LINE VALVE AND WATER MANHOLE.		YARD DRAIN
			TWIST TIMER
			THERMOSTAT

SCHEMATIC PIPING SYMBOLS

	UNION
	REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY
	REDUCER/INCREASER
	UP
	DOWN
	AIR RELEASE VALVE
	BACKPRESSURE VALVE
	GATE VALVE
	BALL VALVE
	CHECK VALVE
	AIR VACUUM RELEASE VALVE
	HOSE BIBB OR WALL HYDRANT
	PRESSURE REDUCING VALVE
	HOSE BIBB OR WALL HYDRANT
	EXISTING PIPE
	NEW PIPE

BURGESS & NIPLE
100 WEST ERIE STREET
PAINESVILLE, OHIO 44077

CITY OF CANTON
SUGAR CREEK
WATER TREATMENT PLANT
FILTER BACKWASH
DECHLORINATION FACILITY

NO.	DESCRIPTION	DATE

JOB NO:	PR58982
DATE:	JAN. 2021
DESIGNED BY:	CMS
DRAWN BY:	GCB
CHECKED BY:	CMS
APPROVED BY:	CMS
SCALE:	NONE

SYMBOLS AND ABBREVIATIONS

GENERAL NOTES AND UTILITIES

- 1. THE TERM "CONTRACTOR" AS USED IN THESE GENERAL NOTES, SHALL REFER TO THE CONTRACTOR OF CONTRACT, AS APPROPRIATE.
2. THE LOCATION OF KNOWN EXISTING UNDERGROUND UTILITIES ARE SHOWN ON THE PLANS AND ARE BELIEVED TO BE ESSENTIALLY CORRECT.
3. ALL EXISTING UTILITIES, SERVICES, POLES, AND CONNECTIONS SHALL BE PROTECTED AT THE CONTRACTOR'S EXPENSE.
4. THE CONTRACTOR SHALL EXPOSE ALL UTILITIES, OR STRUCTURES PRIOR TO CONSTRUCTION TO VERIFY THE VERTICAL AND HORIZONTAL LOCATION OF THE UTILITY, OR STRUCTURE AND ITS EFFECT ON THE NEW CONSTRUCTION.
5. OSHA PROHIBITS CRANE AND BACKHOE OPERATIONS WITHIN 10 FEET OF ENERGIZED PRIMARY CONDUCTORS.
6. ANY EXISTING PROPERTY CORNER PINS OR MONUMENTS DAMAGED OR DESTROYED BY CONSTRUCTION SHALL BE RESET BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE UPON COMPLETION OF THE PROJECT AND PRIOR TO FINAL PAYMENT.
7. ELEVATION BENCHMARKS ARE SHOWN ON THE PLANS. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING ELEVATIONS AND DIMENSIONS AND MAKE ADJUSTMENTS ACCORDINGLY UNDER THE DIRECTION OF THE ENGINEER.
8. THE CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL CONSTRUCTION DEBRIS INCLUDING BUT NOT LIMITED TO EXCESS SOIL, ROCK, OR ANY OTHER TYPE MATERIALS.
9. ALL DISTURBED AREAS OUTSIDE OF THE WALKS, DRIVES, AND STRUCTURES SHALL BE SEEDED AND MULCHED AFTER THE AREAS HAVE BEEN FINISHED GRADED AND TOPSOIL HAS BEEN ADDED.
10. RESTORE DISTURBED AREAS TO PRECONSTRUCTION CONDITION.
11. CONTRACTOR SHALL PROVIDE ONE MARKUP SET OF AS-BUILT DRAWINGS TO THE OWNER AT THE COMPLETION OF THE PROJECT, THE MARKUP SET MUST BE NEAT AND LEGIBLE AND MUST DOCUMENT ALL DEVIATIONS FROM THE ORIGINAL CONTRACT DOCUMENTS.
12. THE SCALE SHOWN ON THE DRAWINGS IS FOR FULL SIZE SHEETS (22"x34"). UNLESS OTHERWISE NOTED.
13. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEMPORARY UTILITIES AS REQUIRED FOR COMPLETION OF WORK AT ANY NEW OR EXISTING STRUCTURES.
14. ANY EXCAVATION WITHIN A ZONE OF INFLUENCE BENEATH NEW OR REPLACEMENT PAVEMENT, DRIVE AREAS, OR SIDEWALKS SHALL BE BACKFILLED WITH COMPACTED GRANULAR MATERIAL FROM BOTTOM OF EXCAVATION TO UNDERSIDE OF PAVEMENT OR SIDEWALK OR TOP OF ZONE OF INFLUENCE.
15. ODOT CLASS 'C' CONCRETE MIX IS SIMILAR TO SPECIFICATION SECTION 03 30 00 CLASS 'A' MIX.
16. THE CONTRACTOR SHALL NOTIFY UTILITY COMPANIES AT LEAST TWO (2) WORKING DAYS, EXCLUDING SATURDAYS, SUNDAYS AND LEGAL HOLIDAYS, PRIOR TO CONSTRUCTION TO HAVE UTILITIES STAKED, MARKED OR OTHERWISE DESIGNATED IN THE CONSTRUCTION AREA IN SUCH A MANNER AS TO INDICATE THEIR COURSE TOGETHER WITH THE APPROXIMATE DEPTH AT WHICH THEY WERE INSTALLED.
17. INDIVIDUAL STORM, SANITARY, GAS, WATER, ELECTRIC, TELEPHONE AND CABLE SERVICE CONNECTIONS MAY NOT BE SHOWN.
18. IT IS THE RESPONSIBILITY OF THE BIDDER TO MAKE HIS OWN ADDITIONAL SURFACE AND SUBSURFACE INVESTIGATIONS OF THE SITE CONDITIONS PRIOR TO SUBMITTING HIS PROPOSAL IF NECESSARY IN HIS OR HER JUDGMENT.
19. ACCESS TO ALL ADJOINING PROPERTIES SHALL BE MAINTAINED AT ALL TIMES.
20. UNLESS MARKED FOR REMOVAL, SPECIAL CARE SHALL BE TAKEN TO AVOID DAMAGE TO TREES AND THEIR ROOT SYSTEM.
21. PRIOR TO CONSTRUCTION, AUDIO-VIDEO COLOR TAPING SHALL BE COMPLETED PER SPECIFICATION SECTION 01 32 34.
22. RIGHT-OF-WAY AND PROPERTY LINES WERE PREPARED FROM RECORD INFORMATION AND DO NOT REPRESENT A BOUNDARY SURVEY.

- 23. THROUGHOUT THESE DRAWINGS AND THE SPECIFICATIONS, REFERENCES MADE TO THE OWNER, ENGINEER, OR ENGINEER/ARCHITECT SHALL BE INTERPRETED AS THE CITY OF CANTON OR THEIR AUTHORIZED REPRESENTATIVE.
24. THE COST OF RELOCATION, MAKE READY WORK, FEES AND PERMITS, AND/OR SECURING ANY UTILITY POLES AS NECESSARY TO COMPLETE THE WORK SHALL BE INCLUDED IN THE BID PRICE, AND THE CONTRACTOR SHALL COORDINATE ALL PHASES WITH THE POWER COMPANY.
25. THE CONTRACTOR SHALL REMOVE AND REINSTALL CULVERT AND/OR DRAINAGE PIPES AS IS NECESSARY TO FACILITATE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS.
26. THE CONTRACTOR WILL BE REQUIRED TO COORDINATE THE LOCATION OF WATER FROM THE CITY OF CANTON.
27. THE STORAGE OF CONSTRUCTION MATERIALS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, AS APPROVED BY THE ENGINEER.
28. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FROM THE CITY OF CANTON PRIOR TO THE START OF CONSTRUCTION.
29. CONTRACTOR SHALL NOTIFY THE CITY ENGINEER 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITY AND SUBMIT A LIST OF ALL SUBCONTRACTORS.

CONSTRUCTION NOISE

- 1. CONSTRUCTION NOISE ASSOCIATED WITH ANY IMPROVEMENT PROJECT, SHALL BE LIMITED TO LEVELS COMMENSURABLE WITH ADJOINING LAND AND THEIR ASSOCIATED USAGE AS DETERMINED BY THE CITY ENGINEER.
ADVERSE CONSTRUCTION NOISE IMPACTS, ANY POWER-OPERATED CONSTRUCTION-TYPE DEVICE SHALL NOT BE OPERATED BETWEEN THE HOURS OF 7:00 PM AND 7:00 AM, UNLESS AUTHORIZED BY THE CITY ENGINEER.

TRENCH CLOSING AND TEMPORARY TOPPING

- 1. THE CONTRACTOR SHALL BE RESPONSIBLE TO DETERMINE THE NECESSARY LEVELS OF PROTECTION AND SAFEGUARDING OF ALL OPEN TRENCHES, WHEN WORK IS EITHER COMPLETED AT THE END OF THE DAY OR SUSPENDED FOR ANY OTHER REASON.
2. AS A MINIMUM, THE CITY REQUIRES ALL TRENCHES TO BE TOPPED WITH 4" OF ODOT 304 LIMESTONE FOR TRENCHES WITHIN EXISTING ROADWAY PAVEMENTS WHEN THE ROADWAY WILL BE OPENED TO VEHICULAR TRAFFIC PRIOR TO PAVEMENT REPLACEMENT.
3. THE TRENCH TOPPING MATERIAL SHALL BE ROLLED OR OTHERWISE COMPLETED AND BE FINISHED FLUSH WITH THE EXISTING ADJOINING PAVEMENT.
4. THE COST OF ALL TRENCH GRANULAR BACKFILL IS TO BE INCLUDED IN THE PRICE FOR WATERLINE REPLACEMENT.
5. ALL APPLICABLE WATERLINES SHALL BE TESTED AS SPECIFIED IN SPECIFICATION SECTION 01 89 19.
6. ALL WATERLINES AND APPURTENANCES SHALL BE CONSTRUCTED ACCORDING TO CITY SPECIFICATIONS AND ODOT 603 SPECIFICATION EFFECTIVE AT THE TIME OF CONSTRUCTION.
7. BEDDING SHALL BE AASHTO M 43, NUMBERS 56, 57, OR 67 LIMESTONE OR ANGULAR CRUSHED GRAVEL STONE.
8. BACKFILL MATERIAL WITHIN THE RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH ODOT 703.11, TYPE '1' GRANULAR MATERIAL (304 AGGREGATE GRADATION ONLY); DEVIATIONS FROM THIS ARE AS FOLLOWS:
A. NO FOUNDRY SAND, AIR COOLED BLAST FURNACE SLAG, GRANULATED SLAG, OR OPEN HEARTH SLAG SHALL BE PERMITTED.
B. ANY EXCEPTION TO THE TYPE '1' GRANULAR MATERIAL SHALL BE WITH THE SUPPLEMENTAL APPROVAL OF THE CITY ENGINEER.
9. BACKFILL METHODS WITHIN THE RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH ODOT 603; DEVIATION FROM THIS ARE AS FOLLOWS:
A. CONTRACTOR MAY REQUEST TO EXCEED 8" PLACEMENT LIFTS DURING BACKFILL PROCEDURE.
10. BACKFILL MATERIAL AND COMPACTION OUTSIDE THE RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH ODOT 603.

DEWATERING OPERATIONS

- 1. WHEN DEEMED NECESSARY, THE CONTRACTOR MAY INSTALL DEWATERING EQUIPMENT PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
2. THE PROPOSED LOCATION OF WELL POINTS, HEADER PIPE, ELECTRICAL DISTRIBUTION, GENERATORS AND DISCHARGE PIPES, ETC. SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS FOR THE INSTALLATION AND SUBSEQUENT REMOVAL OF DEWATERING EQUIPMENT AS MAY BE NECESSARY PER STATE AND LOCAL GOVERNING AGENCIES.
4. INSTALLATION OF ALL ELECTRICAL EQUIPMENT, INCLUDING GROUNDING AND PROTECTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
5. CONTRACTOR SHALL PROVIDE ALL COMBUSTIBLE ENGINE DRIVEN GENERATORS WITH "HOSPITAL GRADE" MUFFLERS.

DEMOLITION GENERAL NOTES

- 1. OWNER HAS FIRST RIGHT OF REFUSAL ON ALL MATERIAL AND EQUIPMENT REMOVED.
2. ALL ABANDONED ELECTRICAL WIRING AND CONDUITS SHALL BE REMOVED UNLESS OTHERWISE NOTED.
3. SEE SPECIFICATIONS FOR ADDITIONAL DEMOLITION REQUIREMENTS
4. ALL CONCRETE TO BE DEMOLISHED SHALL BE ASSUMED TO BE STEEL REINFORCED THROUGHOUT.
5. CONTRACTOR SHALL FIELD VERIFY LOCATIONS, DIMENSIONS, AND SIZES OF ALL ITEMS BEFORE BEGINNING WORK.

PAVEMENT

- 1. ROADWAYS, DRIVES AND SIDEWALKS DISTURBED BY CONSTRUCTION SHALL BE REPLACED WITH LIKE MATERIAL, SEE DETAIL ON PLANS AND SPECIFICATION SECTION 32 10 01.01.
2. WHERE NECESSARY TO DISTURB ASPHALT OR CONCRETE ROADWAYS OR DRIVES, PAVEMENT SHALL BE SAW CUT IN NEAT STRAIGHT LINES.
3. THE CONTRACTOR WILL BE REQUIRED TO MAINTAIN VEHICULAR TRAFFIC ACCESSIBILITY THROUGHOUT THE ENTIRE SITE DURING CONSTRUCTION.
4. ALL CONCRETE USED FOR ROADWAYS AND DRIVEWAYS INCLUDING APRONS SHALL BE CLASS MS IN ACCORDANCE WITH ODOT 499.
5. THE CONTRACTOR SHALL NOTIFY EACH RESIDENT BY LETTER A MINIMUM OF 48 HOURS IN ADVANCE OF WORK WHICH SHALL LIMIT ACCESS TO THEIR DRIVEWAY.
6. THERE SHALL BE NO ASPHALT BINDER ADJUSTMENT AS STATED IN ODOT 401.20.
7. ANY PAVEMENT STRIPING DISTURBED AS A RESULT OF CONSTRUCTION SHALL BE RESTORED TO MATCH ORIGINAL STRIPING.
8. CONTRACTOR SHALL FURNISH AND APPLY WATER AND/OR CALCIUM CHLORIDE FOR DUST CONTROL AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL

- 1. TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE CITY OF CANTON STANDARDS, AND THESE PLANS AND SPECIFICATIONS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE (IN ACCORDANCE WITH THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES) FOR ALL SIGNING AND TRAFFIC CONTROL DEVICES WITHIN THE WORK AREA.
3. TWO LANES OF TRAFFIC SHALL BE MAINTAINED DURING NON-WORKING HOURS (NIGHTS AND WEEKENDS) AND ALL OPEN EXCAVATIONS SHALL BE COVERED AND/OR BACKFILLED AT THE END OF EACH WORK DAY.
4. ANY TEMPORARY ROADWAY CLOSING MUST BE APPROVED IN WRITING BY THE CITY TRAFFIC ENGINEER AND ANY OTHER PUBLIC AGENCY HAVING JURISDICTION.

PROJECT SAFETY

- 1. THE CONTRACTOR SHALL MAINTAIN A SAFE WORKING ENVIRONMENT AT THE PROJECT SITE AT ALL TIMES. THE CONTRACTOR SHALL PROPERLY SUPPORT AND/OR MAINTAIN ALL EXCAVATIONS PER APPLICABLE SAFETY REQUIREMENTS AND COMPLY WITH ALL OSHA REGULATIONS.
ADEQUATE BARRICADES, WARNING LIGHTS, SIGNS, FENCING, ETC. SHALL BE ERECTED AROUND THE CONSTRUCTION AREA DURING ALL NON-WORKING HOURS TO ALERT PERSONS OF THE POTENTIAL DANGER ASSOCIATED WITH THE AREA UNDER CONSTRUCTION AS WELL AS TO PREVENT ACCESS BY UNAUTHORIZED PERSONNEL TO THE CONSTRUCTION SITE/AREA.
THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THE SAFETY OF THE GENERAL PUBLIC AS WELL AS ALL CONSTRUCTION PERSONNEL.
PUBLIC STREETS SHALL BE KEPT CLEAN AND FREE OF DEBRIS (MUD, STONE, ETC.) AT ALL TIMES.
CONTRACTOR SHALL ALERT ALL LOCAL EMERGENCY AGENCIES (FIRE, POLICE, AMBULANCE, ETC.) OF THE NATURE OF THE PROPOSED PROJECT PRIOR TO BEGINNING AND CONSTRUCTION ACTIVITY. ACCESS FOR EMERGENCY VEHICLES SHALL BE MAINTAINED AT ALL TIMES.

GENERAL & SUB-CONTRACTOR COORDINATION

- 1. FOR MECHANICAL OPENINGS 12" WIDE AND SMALLER THRU NEW AND EXISTING WALLS, HVAC CONTRACTOR SHALL PROVIDE ALL CUTTING AND PATCHING REQUIRED FOR INSTALLATION OF MECHANICAL WORK.
2. FOR MECHANICAL OPENINGS GREATER THAN 12" WIDE IN NEW AND EXISTING WALLS, GENERAL CONTRACTOR SHALL PROVIDE ALL CUTTING AND PATCHING REQUIRED FOR INSTALLATION OF MECHANICAL WORK.
3. MECHANICAL OPENING IS DEFINED AS THE DUCTWORK DIMENSION PLUS INSULATION, THICKNESS AS SPECIFIED.
4. UNLESS OTHERWISE NOTED, THE GENERAL CONTRACTOR IS RESPONSIBLE FOR WORK INVOLVING THE REMOVAL OF EXISTING ELECTRICAL VAULTS FOR BURIED ELECTRICAL CONDUIT AS SHOWN ON PLANS.
5. NEW FIELD MOUNTED INSTRUMENTS ARE TO BE FURNISHED AND INSTALLED BY SYSTEM INTEGRATOR, WIRED BY ELECTRICAL CONTRACTOR UNLESS OTHERWISE NOTED.
6. MAGNETIC FLOW METERS SHALL BE SUPPLIED BY THE SYSTEM INTEGRATOR, WIRED BY THE ELECTRICAL CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR.

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100 WEST ERIE STREET
PAINESVILLE, OHIO 44077

CITY OF CANTON
SUGAR CREEK
WATER TREATMENT PLANT
FILTER BACKWASH
DECHLORINATION FACILITY

Table with 4 columns: NO., DESCRIPTION, REVISIONS, DATE

JOB NO: PR58982

DATE: JAN. 2021

DESIGNED BY: KAS

DRAWN BY: KAS

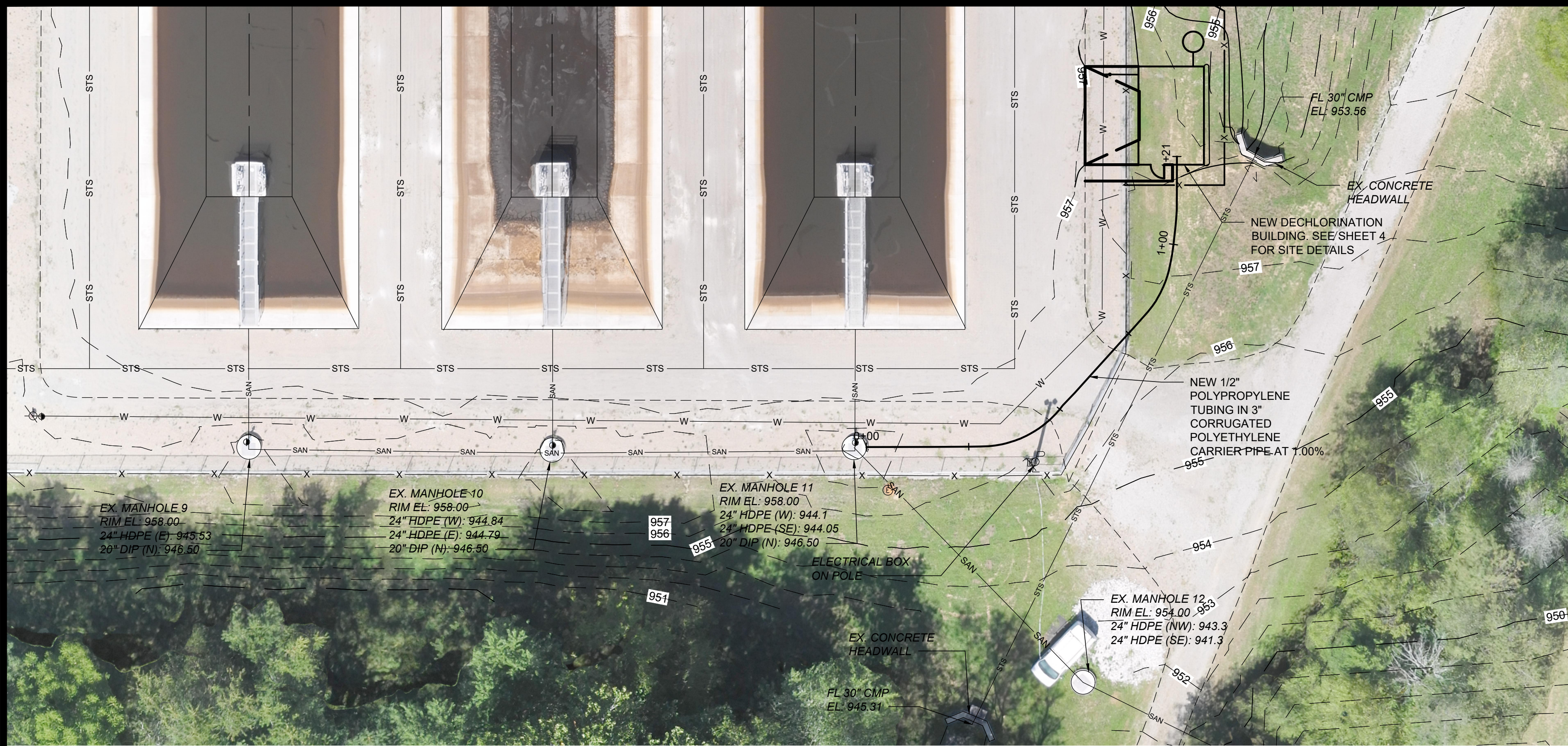
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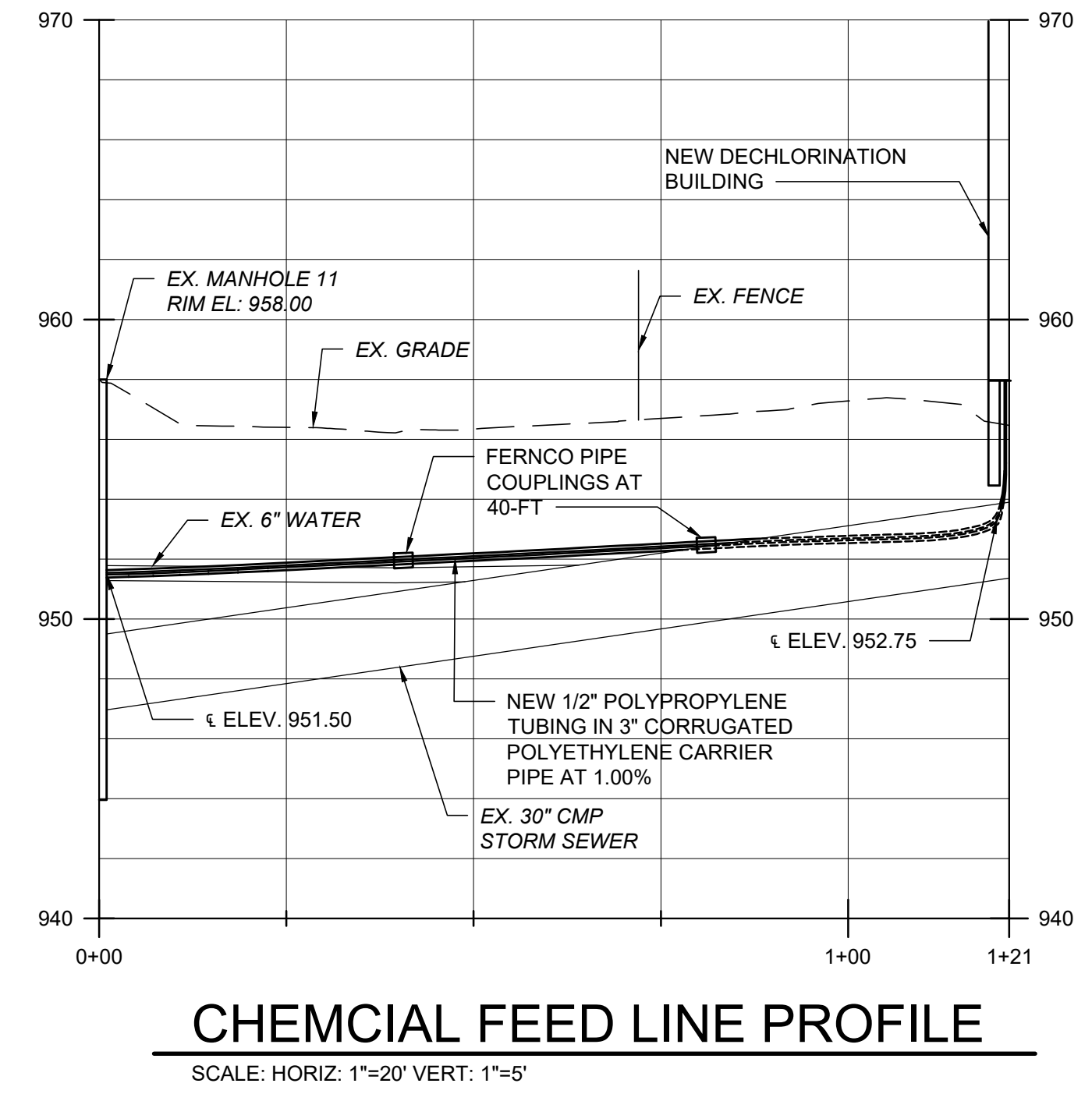
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GENERAL NOTES

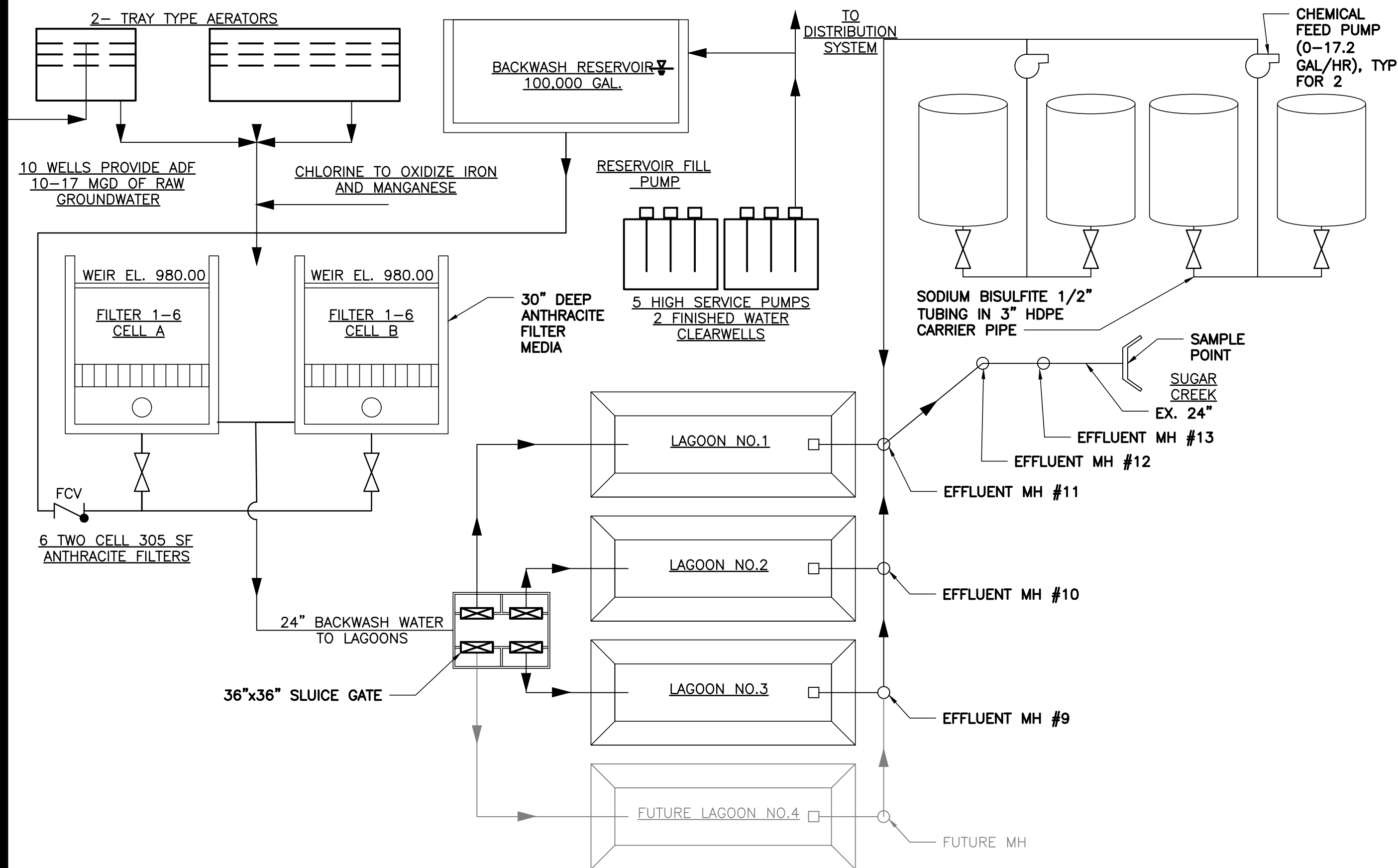
3



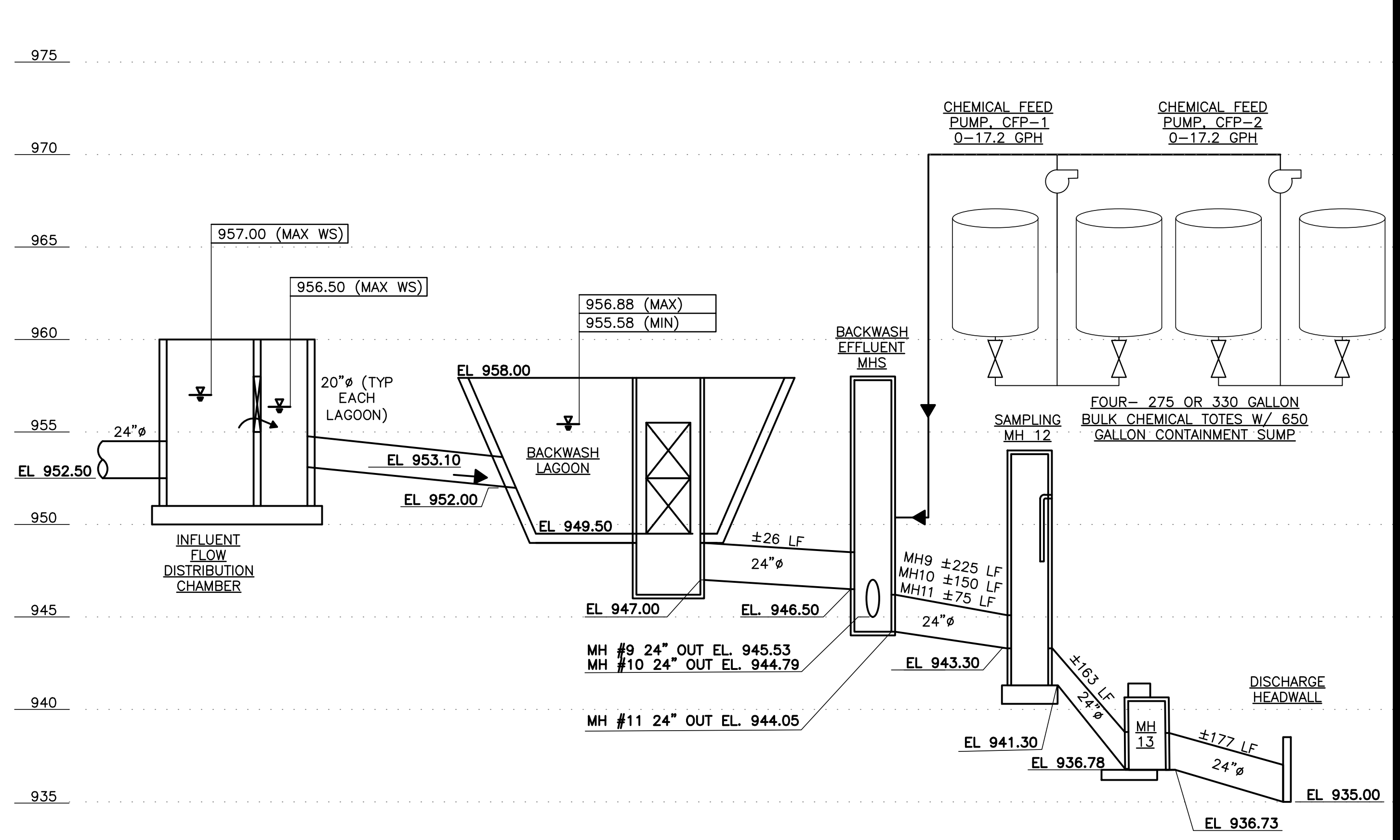
CHEMICAL FEED LINE PLAN
SCALE: 1" = 20'



CHEMICAL FEED LINE PROFILE
SCALE: HORIZ: 1"=20' VERT: 1"=5'



PROCESS FLOW DIAGRAM
SCALE: NONE

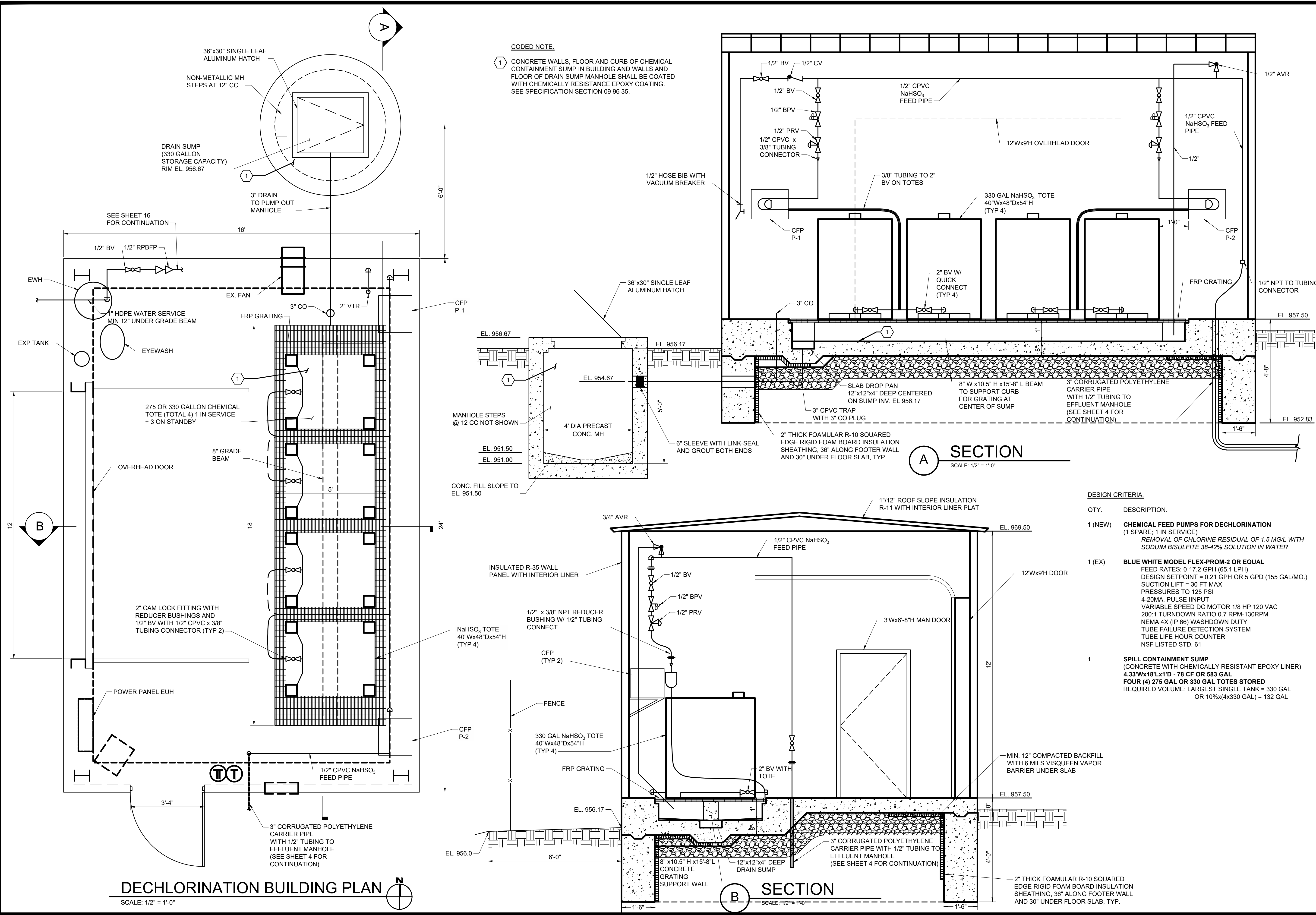


HYDRAULIC PROFILE
SCALE: NONE

NO.	DESCRIPTION	DATE

JOB NO: PR58982
DATE: JAN. 2021
DESIGNED BY: CMS
DRAWN BY: GCB
CHECKED BY: CMS
APPROVED BY: CMS
SCALE: AS NOTED

CHEMICAL FEED LINE, PROCESS FLOW DIAGRAM, HYDRAULIC PROFILE



CODED NOTE:
 ① CONCRETE WALLS, FLOOR AND CURB OF CHEMICAL CONTAINMENT SUMP IN BUILDING AND WALLS AND FLOOR OF DRAIN SUMP MANHOLE SHALL BE COATED WITH CHEMICALLY RESISTANCE EPOXY COATING. SEE SPECIFICATION SECTION 09 96 35.

A SECTION
 SCALE: 1/2" = 1'-0"

B SECTION
 SCALE: 1/2" = 1'-0"

DECHLORINATION BUILDING PLAN
 SCALE: 1/2" = 1'-0"

DESIGN CRITERIA:

QTY:	DESCRIPTION:
1 (NEW)	CHEMICAL FEED PUMPS FOR DECHLORINATION (1 SPARE; 1 IN SERVICE) REMOVAL OF CHLORINE RESIDUAL OF 1.5 MG/L WITH SODIUM BISULFITE 38-42% SOLUTION IN WATER
1 (EX)	BLUE WHITE MODEL FLEX-PROM-2 OR EQUAL FEED RATES: 0-17.2 GPH (65.1 LPH) DESIGN SETPOINT = 0.21 GPH OR 5 GPD (155 GAL/MO.) SUCTION LIFT = 30 FT MAX PRESSURES TO 125 PSI 4-20MA PULSE INPUT VARIABLE SPEED DC MOTOR 1/8 HP 120 VAC 200:1 TURNDOWN RATIO 0.7 RPM-130RPM NEMA 4X (IP 66) WASHDOWN DUTY TUBE FAILURE DETECTION SYSTEM TUBE LIFE HOUR COUNTER NSF LISTED STD. 61
1	SPILL CONTAINMENT SUMP (CONCRETE WITH CHEMICALLY RESISTANT EPOXY LINER) 4.33'Wx18'Lx1'D - 78 CF OR 583 GAL FOUR (4) 275 GAL OR 330 GAL TOTES STORED REQUIRED VOLUME: LARGEST SINGLE TANK = 330 GAL OR 10%x(4x330 GAL) = 132 GAL

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CITY OF CANTON
 SUGAR CREEK
 WATER TREATMENT PLANT
 FILTER BACKWASH
 DECHLORINATION FACILITY

NO.	DESCRIPTION	REVISIONS	
		DATE	

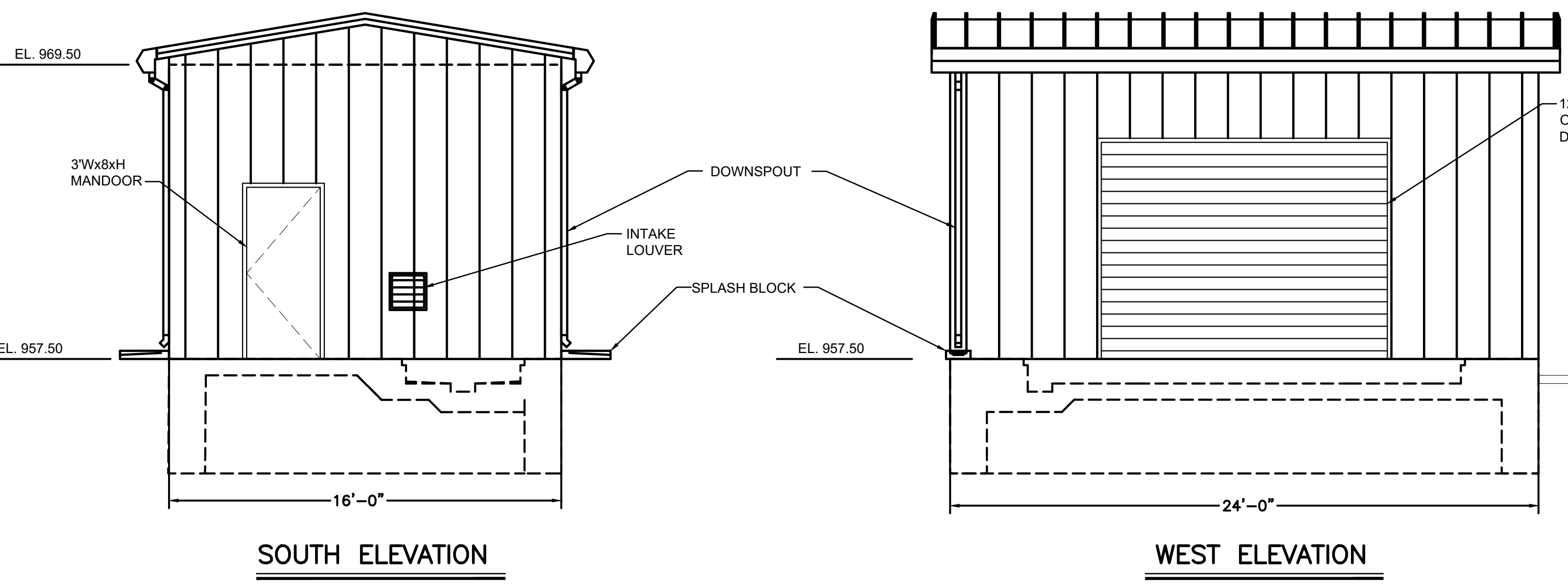
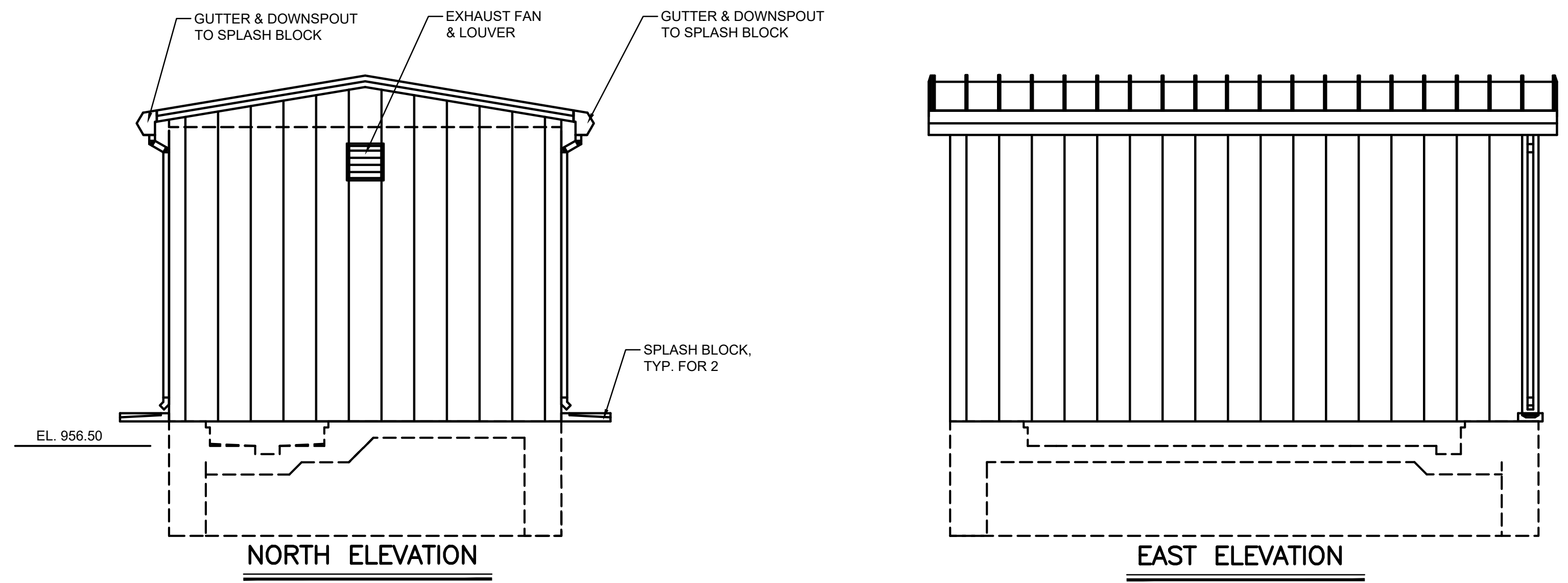
JOB NO: PR59892
 DATE: JAN. 2021
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 SCALE: NONE

PROCESS
 DECHLORINATION
 BUILDING

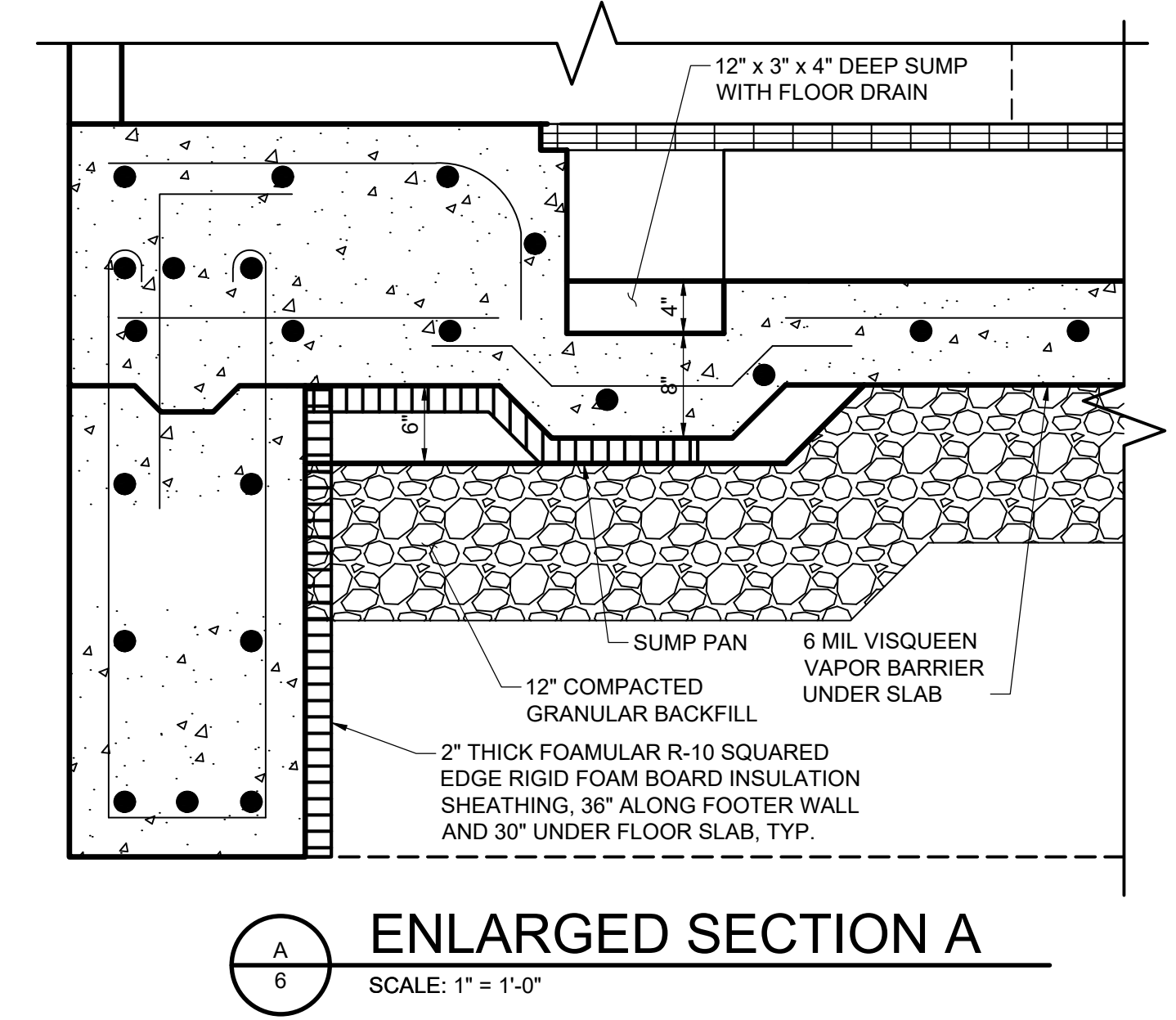
NO.	DESCRIPTION	DATE

JOB NO: PR58982
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SCALE: NONE

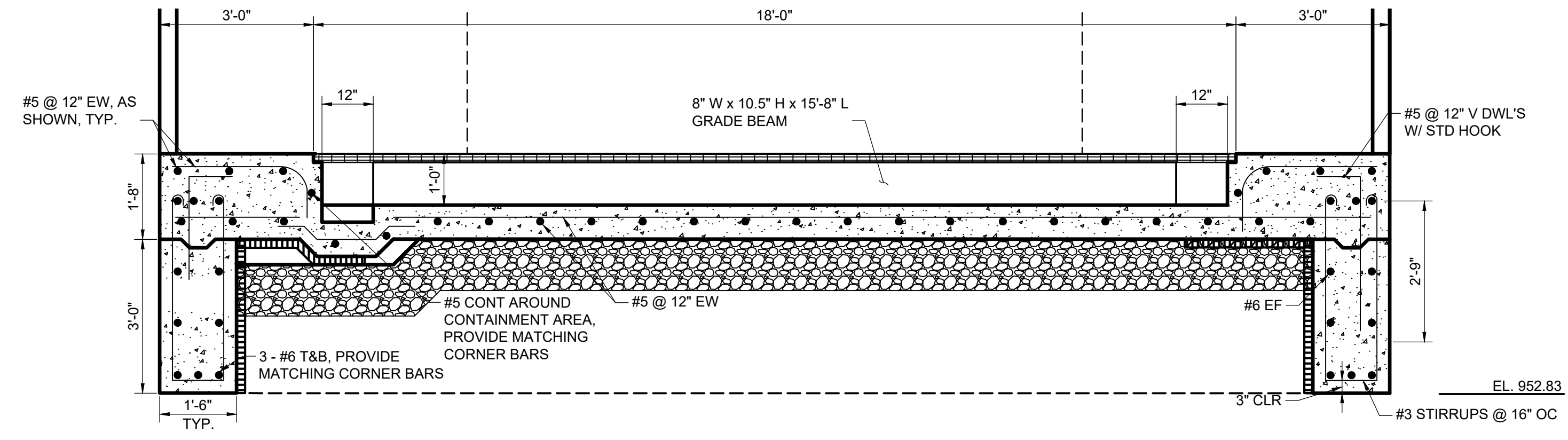
ARCHITECTURAL ELEVATIONS



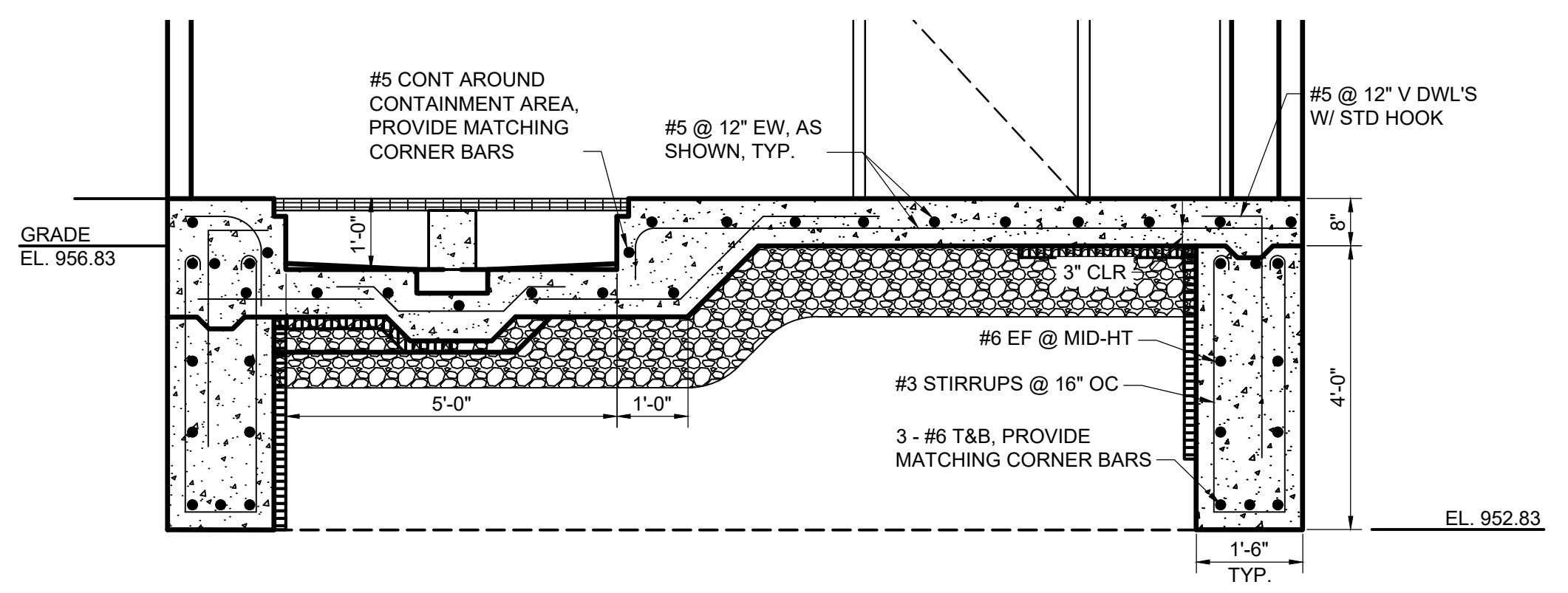
- NOTES:**
- 16'x24' PREFAB METAL BUILDING WITH INNER LINER PLATE, R-13 WALL AND R-19 INSULATION FOR ROOF.
 - PROVIDE CHEMICAL RESISTANT EPOXY COATING OF WALLS, CURB, AND SUMP.
 - SEE SHEET 16 FOR MECHANICAL HC AND PLUMBING DETAILS.



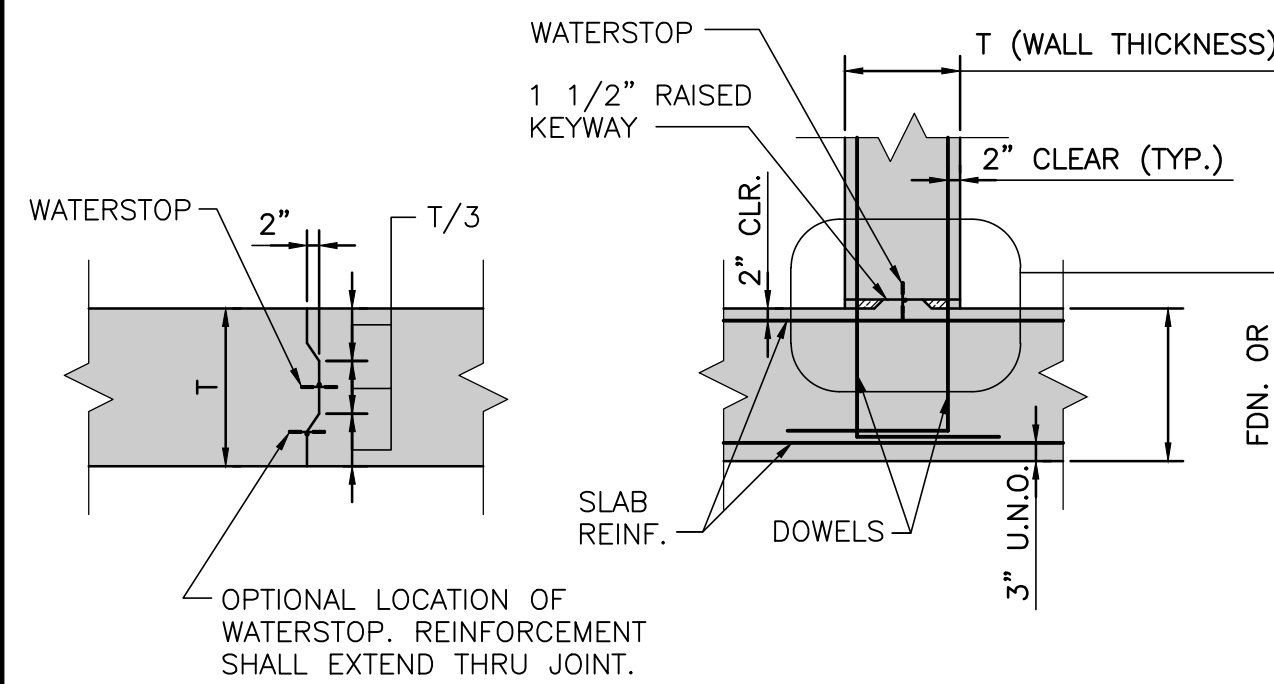
ENLARGED SECTION A
SCALE: 1" = 1'-0"



SECTION A
SCALE: 1/2" = 1'-0"

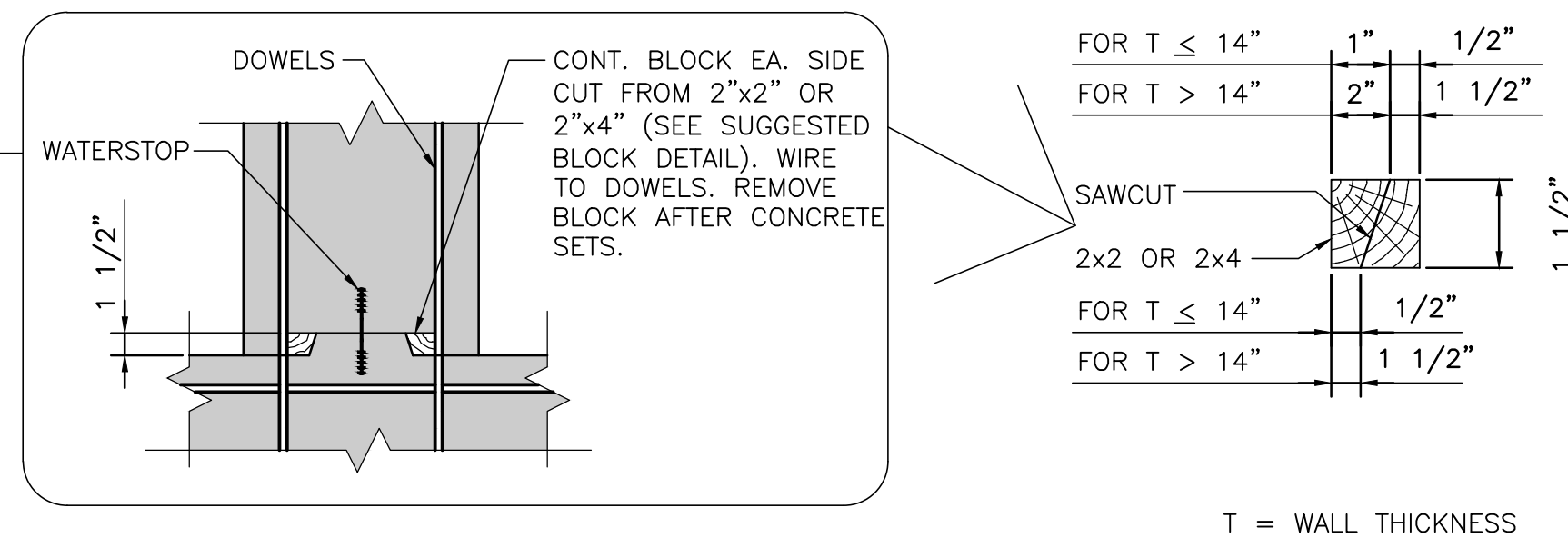


SECTION B
SCALE: 1/2" = 1'-0"



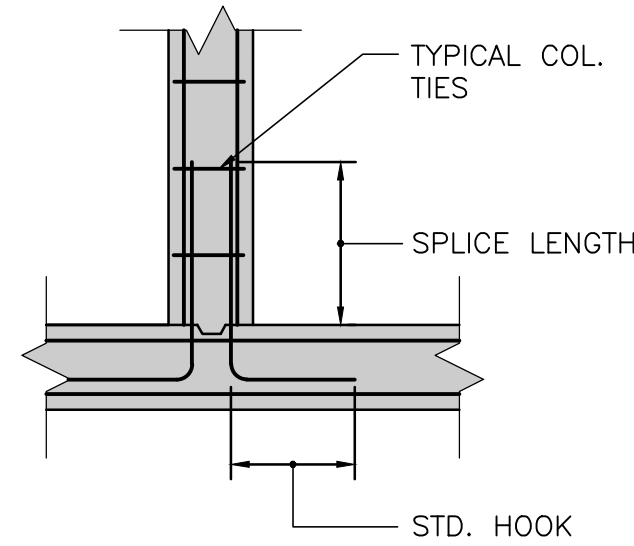
TYPICAL CONSTRUCTION JOINT

WATERSTOP REQUIRED IN ALL CONSTRUCTION JOINTS. ALLOW 12 HOURS TO LAPSE BETWEEN ADJACENT CONCRETE POURS.



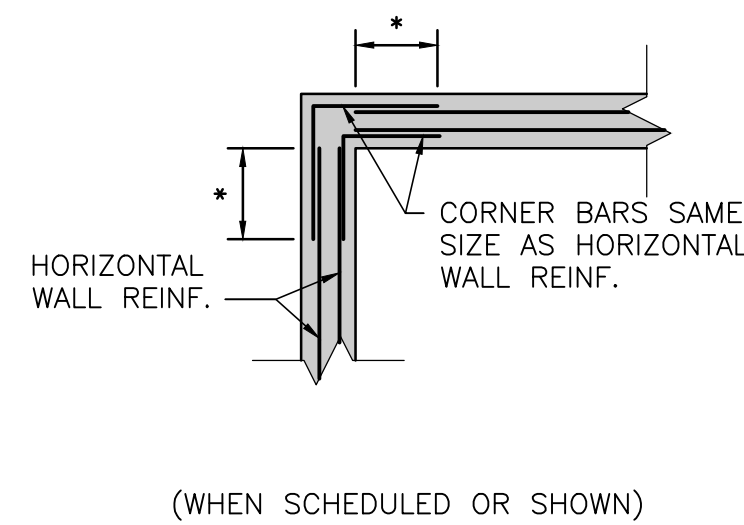
SUGGESTED BLOCK DETAIL

T = WALL THICKNESS



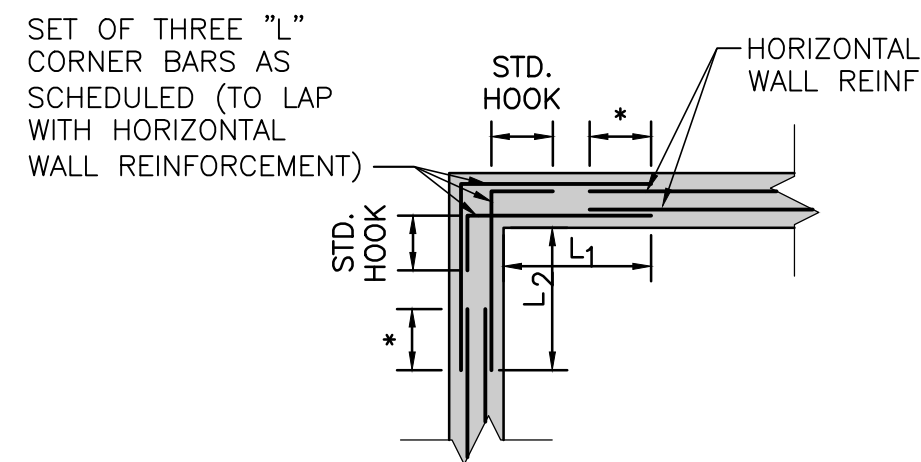
TYPICAL COLUMN/FOOTING DOWEL DETAIL

* SEE NOTE 8 ON THIS SHEET FOR REQUIRED LAP SPLICE



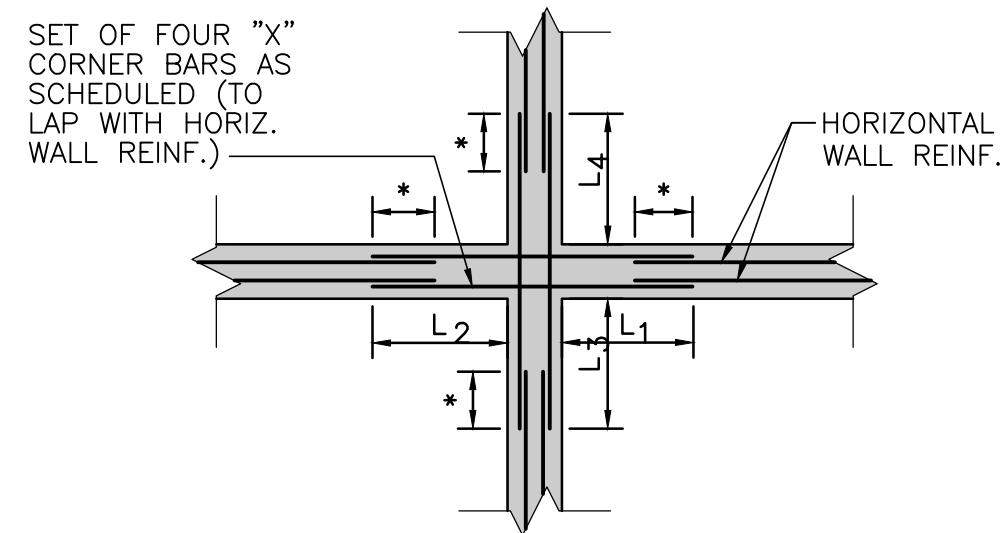
TYPICAL "ELL" CORNER BARS HORIZONTAL WALL BARS, EACH FACE

(WHEN SCHEDULED OR SHOWN)



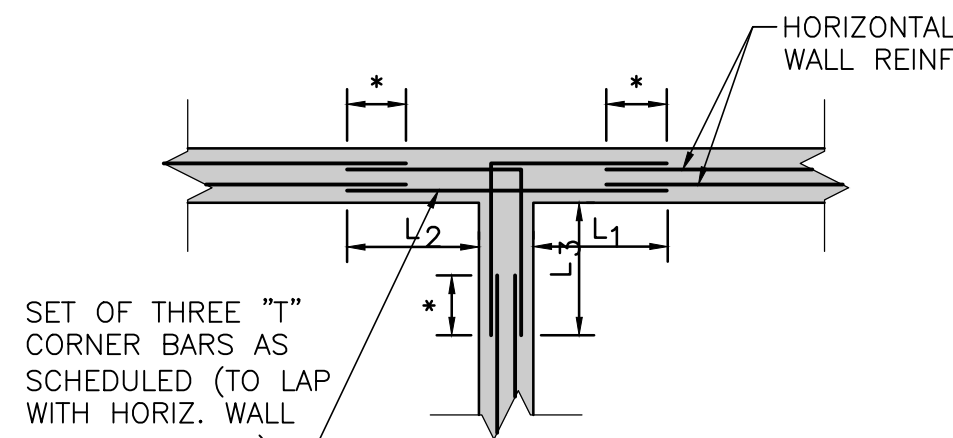
TYPICAL "ELL-TYPE A" CORNER

(REQUIRED WHEN NOT OTHERWISE SHOWN OR SCHEDULED)



TYPICAL "CROSS-TYPE C" CORNER

(REQUIRED WHEN NOT OTHERWISE SHOWN OR SCHEDULED)



TYPICAL "TEE TYPE B" CORNER

(REQUIRED WHEN NOT OTHERWISE SHOWN OR SCHEDULED)

TYPICAL HORIZONTAL CORNER BAR DETAILS

* SEE NOTE 8 ON THIS SHEET FOR REQUIRED LAP SPLICE
L1, L2, L3 AND L4 = SPLICE LENGTH + 12"

MINIMUM LAP SPLICE AND ANCHORAGE DIMENSION TABLE

(4500 PSI CONCRETE)

TOP BARS			OTHER BARS		
BAR SIZE	SPLICE	ANCHORAGE	BAR SIZE	SPLICE	ANCHORAGE
#3	23"	18"	#3	18"	14"
#4	31"	24"	#4	23"	18"
#5	38"	29"	#5	29"	23"
#6	46"	35"	#6	35"	27"
#7	66"	51"	#7	51"	39"
#8	76"	58"	#8	58"	45"
#9	85"	66"	#9	66"	51"
#10	95"	73"	#10	73"	56"
#11	104"	80"	#11	80"	66"

NOTES:

- THIS TABLE IS FOR "LAP CLASS B" AND "CATEGORY 3."
- THIS TABLE SHALL NOT BE USED WHERE CLEAR COVER IS LESS THAN 2" OR WHERE CENTER TO CENTER SPACING IS LESS THAN 6".
- TOP BARS SHALL BE BEAM AND/OR SLAB HORIZONTAL REINFORCEMENT SO PLACED THAT MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE TOP REINFORCEMENT.
- MODIFY THE REQUIRED LENGTH BY THE FOLLOWING FACTOR, WHEN APPLICABLE:
 - LIGHTWEIGHT CONCRETE AGGREGATE x 1.30
 - EPOXY COATED REINFORCEMENT x 1.50
 - BUNDLED BARS: 3 BAR BUNDLE x 1.20
 - 4 BAR BUNDLE x 1.33
- WHEN LAPPING TWO DIFFERENT SIZE BARS, USE THE SPLICE DIMENSION OF THE SMALLER BAR OR THE ANCHORAGE DIMENSION OF THE LARGER BAR. USE WHICHEVER DIMENSION IS LARGER.
- WHERE CADWELD IS NOTED IN THE TABLE, PROVIDE WELDED OR MECHANICAL CONNECTION CAPABLE OF DEVELOPING 125 PERCENT OF YIELD STRENGTH, F_y, OF THE BAR IN TENSION OR COMPRESSION (ACI 318, 12.14.3.2 OR 12.14.3.4).

GENERAL NOTES

- ALL CONCRETE SCHEDULED FOR DEMOLITION SHALL BE ASSUMED TO BE REINFORCED.
- MISCELLANEOUS DETAILS AND NOTES APPLY TO ALL STRUCTURES AND BUILDINGS UNLESS NOTED OTHERWISE.
- DURING CONSTRUCTION, TANKS, BASEMENTS, AND OTHER STRUCTURES, WHETHER THEY BE CONCRETE OR OTHER MATERIAL, CAN BE BUOYANT PRIOR TO BEING LOADED WITH BACKFILL AND SUPERSTRUCTURE. IN THE EVENT THAT THE EXCAVATION OR OTHER AREA AROUND THE STRUCTURE IS IN DANGER OF BEING FLOODED OR THE SURROUNDING GROUND AROUND THE EXCAVATION BECOMES SATURATED, THE CONTRACTOR SHALL PROVIDE SUFFICIENT OPENINGS OR OTHER DEVICES THAT WILL MAINTAIN THE WATER LEVEL ON THE INSIDE AT THE SAME ELEVATION AS THE OUTSIDE AND TAKE OTHER APPROPRIATE MEASURES THAT ENSURES THAT THE STRUCTURES DO NOT FLOAT. THE MEASURES TAKEN SHALL NOT DAMAGE THE STRUCTURES. MEASURES SHALL BE PROVIDED THAT WILL ENSURE PROTECTION OF THE STRUCTURES AGAINST FLOATATION WHEN THE CONSTRUCTION SITE IS UNATTENDED. THE CONTRACTOR WILL BE RESPONSIBLE FOR DESIGN OF A PLAN TO PREVENT ANY DAMAGE DUE TO FLOATATION AND SHALL SUBMIT THE PLAN TO THE OWNER PRIOR TO INITIATION OF CONSTRUCTION. THE CONTRACTOR WILL BE RESPONSIBLE TO IMPLEMENT THE PLAN FOR PROTECTION, AND WILL BE RESPONSIBLE FOR ALL DAMAGES TO STRUCTURES THAT BECOME BUOYANT.
- ALL OUTSIDE EXPOSED CORNERS, INCLUDING CONCRETE COLUMNS, EQUIPMENT PADS, BEAMS, PIER WALLS, AND SLABS SHALL HAVE A 1" X 45° CHAMFER, UNLESS NOTED OTHERWISE.
- REINFORCEMENT STEEL COVER SHALL BE AS GIVEN IN "CONCRETE COVER FOR REINFORCEMENT TABLE".
- IN TWO WAY SOLID SLABS, PLACE SHORT SPAN BARS NEAREST TO THE SURFACE OF THE CONCRETE, UNLESS OTHERWISE SHOWN.
- TEMPERATURE STEEL SHALL BE PLACED FURTHER FROM THE SURFACE OF THE CONCRETE THAN THE MAIN REINFORCING.
- ALL REINFORCING STEEL LAP SPLICES SHALL CONFORM TO THE "MINIMUM LAP SPLICE AND ANCHORAGE DIMENSION TABLE" UNLESS SHOWN OR NOTED OTHERWISE.
- HOOKS, BENDS, SUPPORTS, AND SPACERS SHALL BE IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" (ACI 315).
- REINFORCING BARS SHALL NOT BE BENT IN THE FIELD BY HEATING.
- REINFORCING STEEL NOT SPECIFICALLY SHOWN OR NOTED SHALL BE A MINIMUM OF #5 @ 12" O.C., E.W., E.F.
- CONCRETE BEAMS, GIRDERS, BRACKETS, COLUMN CAPITALS, AND HAUNCHES SHALL BE CONSIDERED AS PART OF THE FLOOR SYSTEM AND SHALL BE PLACED MONOLITHICALLY UNLESS NOTED OTHERWISE.
- VERTICAL BARS IN WALLS AND COLUMNS SHALL EXTEND TO WITHIN 3" OF THE TOP SURFACE OF THE CONCRETE SLAB OR BEAM WHICH RESTS UPON IT, UNLESS NOTED OTHERWISE.
- NO HORIZONTAL JOINTS SHALL BE MADE IN SLABS OR BEAMS. NOT ALL CONSTRUCTION JOINTS THAT ARE REQUIRED HAVE BEEN SHOWN ON THE DRAWINGS. CONSTRUCTION JOINTS ARE REQUIRED AT THE BOTTOM AND TOP OF ALL COLUMNS, ALL TANK, FLUME, BUILDING, AND FOOTER WALLS, WHERE SPECIFICALLY SHOWN ON THE DRAWINGS, AND WHERE CALLED FOR IN THE SPECIFICATIONS. UNLESS SHOWN OTHERWISE, THE MAXIMUM LENGTH OF WALL POURS SHALL NOT EXCEED 40 FEET AND SLAB POURS SHALL NOT EXCEED 40 FEET IN LENGTH OR WIDTH. THE CONTRACTOR MUST SUBMIT TO THE ENGINEER FOR APPROVAL, PRIOR TO ANY REINFORCING STEEL SHOP DRAWINGS SUBMITTALS, A CONSTRUCTION JOINT LAYOUT SHOWING ALL PLANNED CONSTRUCTION JOINTS. ANY MODIFICATIONS TO THE CONCRETE OR REINFORCING STEEL SHOWN ON THE PLANS THAT BECOME NECESSARY TO ACCOMMODATE THE CONTRACTOR'S NEW JOINT LOCATIONS SHALL BE PAID FOR BY THE CONTRACTOR. CONSTRUCTION JOINTS SHALL BE AS DETAILED ON THE STANDARD STRUCTURAL DETAIL SHEET, COMPLETE WITH WATERSTOP AS NOTED.
- WATERSTOP FOR CONSTRUCTION JOINTS SHALL BE PVC SERRATED TYPE WITHOUT CENTER BULB, NOT LESS THAN 6" WIDTH AND 3/8" THICK, WIRESTOP, PAUL MURPHY PLASTIC COMPANY, OR EQUAL WITH ALL JOINTS SPLICED.
- WATERSTOP FOR EXPANSION JOINTS SHALL BE PVC SERRATED TYPE, WITH CENTER BULB NOT LESS THAN 9" WIDE AND 3/8" THICK, WIRESTOP, PAUL MURPHY PLASTIC COMPANY, OR EQUAL WITH ALL JOINTS SPLICED.
- WATERSTOP SHALL BE PROPERLY MITERED AND WELDED AT ALL INTERSECTIONS. LAP JOINTS WILL NOT BE PERMITTED.
- ALL WATERSTOPS SHALL BE PROPERLY SUPPORTED AND WIRED TO REINFORCING TO REMAIN STRAIGHT AND TRUE.
- PROVIDE MOIST CURING BY KEEPING CONCRETE SURFACES CONTINUOUSLY WET FOR A MINIMUM OF SEVEN DAYS.
- SEE SPECIFICATIONS FOR GROUT FILL OR TOPPING (CLASS "D" CONCRETE) FOR TANK BOTTOMS AND FLUMES. GROUT SHALL BE SCREENED BY PROCESS EQUIPMENT WHERE AND WHEN APPLICABLE.
- ALL TANK LEAKS DURING CONSTRUCTION SHALL BE REPAIRED BY INJECTION. NO WATER PLUGS WILL BE ALLOWED.
- PROVIDE SOLID OR NON-CORED MASONRY BEARING FOR ALL STRUCTURAL STEEL BEAMS & ALL CONCRETE BEAMS & SLABS (INCLUDING PRECAST SLABS) BEARING ON MASONRY. TWO COURSES UNDER THE LINE OF BEARING OF ALL STEEL & CONCRETE BEAMS, A MIN. OF 1'-4" EACH SIDE OF THE CENTERLINE OF BEARING.
- WHERE NEW UNIT MASONRY REPLACEMENT OR PATCHING IS REQUIRED WITHIN BOUNDARIES OF EXISTING MASONRY, BRICK SHALL BE TOOTHED IN; AND GLAZED STRUCTURAL TILE AND CONCRETE BLOCK SHALL HAVE CUT VERTICAL JOINTS.
- ALL WELDS SHALL CONFORM TO THE STANDARDS SET FORTH BY THE AMERICAN WELDING SOCIETY (AWS), THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION AND THE ALUMINUM ASSOCIATION.
- ALL ALUMINUM IN CONTACT WITH CONCRETE OR DISSIMILAR METALS SHALL BE COATED WITH TWO COATS OF COAL TAR EPOXY, APPROVED BY THE ENGINEER.
- ALL ANCHORS SHALL BE STAINLESS STEEL.
- BEARING PADS SHALL BE DUROMETER 60 UNLESS NOTED OTHERWISE.
- GENERAL CONTRACTOR TO SUPPLY PADS FOR ALL EQUIPMENT IN ALL SECTIONS.
- FOR STRUCTURAL INSPECTION REQUIREMENTS, SEE DRAWING D-11.

DESIGN CRITERIA: GENERAL

SOILS INVESTIGATION & REPORT:

GEOTECHNICAL ENGINEERING CO.: INTERTEK - PSI
REPORT OF SUBSURFACE EXPLORATION DATED: JUNE 12, 2019
NET ALLOWABLE SOIL BEARING PRESSURES:
FOOTINGS - 2,500 PSF ON NATURAL SOILS OR ENGINEERED FILL
DRILLED SHAFTS/MAT FOUNDATION ON BEDROCK: 5,000 PSF

LATERAL EARTH PRESSURES

CANTILEVERED RETAINING WALLS	50	PCF EFP (ABOVE WATER TABLE)
RESTRAINED RETAINING WALLS	70	PCF EFP
ABOVE WATER TABLE	100	PCF EFP
BELOW WATER TABLE	100	PCF EFP

DESIGN STRENGTHS:

MATERIAL	ITEM	STRENGTH	ASTM SPECIFICATIONS
CONCRETE	CIP	4,500 PSI@28 DAYS	C150, C330, C260, C494, C94
	REBAR	F _y = 60,000 PSI	A615
	WWF	F _y = 60,000 PSI	A185
	PRECAST	5,000 PSI@28 DAYS	C150, C330, C260, C494
TOPPING	WWF	4,000 PSI@28 DAYS	C150, C330, C260, C494
	REBAR	F _y = 60,000 PSI	A185
	STRAND	F _y = 270,000 PSI	A416
	BLOCK	F _m = 2,000 PSI	C90 (GRADE N, TYPE 1)
MASONRY	BRICK	F _m = 2,400 PSI	C216 (GRADE SW, TYPE FBS)
	MORTAR	TYPE S	C270, (PROPORTION SPEC.)
	GROUT	F _m = 2,000 PSI	A476
	JT. REINF.	F _y = 60,000 PSI	A82
STEEL & LINTELS	REBAR	F _y = 60,000 PSI	A615
	WF & I	F _y = 50,000 PSI	A992
	OTHERS	F _y = 36,000 PSI	A36
	PL & BAR	F _y = 36,000 PSI	A36
ALUMINUM	PIPE	F _y = 35,000 PSI	A53 GRADE B, TYPE E OR S
	BOLTS	ANC. ROD F _y = 36,000 PSI	A325 (N) - SNUG TIGHT F1554
	SHAPES		ALLOY 6061-T6
	GRATING		ALLOY 6063

DESIGN LOADS:

MIN. FLOOR DESIGN LIVE LOAD
FLOORS 300 PSF

MIN. ROOF DESIGN LIVE LOAD
FLAT ROOFS (≤ 0.5/12) 25 PSF

MIN. ROOF DESIGN SUPERIMPOSED DEAD LOAD
FLAT ROOFS 18 PSF

ROOF SNOW LOAD: PER OBC 1608
GROUND SNOW LOAD 20 PSF
BASIC FLAT ROOF SNOW LOAD 22 PSF

EXPOSURE COEFFICIENT, C_e 1.0
IMPORTANCE FACTOR, I_s 1.1
THERMAL FACTOR, C_t 1.0
RAIN ON SNOW PER ASCE 7-10 5 PSF

WIND LOADS:

BASIC WIND SPEED V_{ult} 120 MPH
INTERNAL PRESSURE COEFF: +0.18, -0.18
EXPOSURE CATEGORY C

MAIN WIND FORCE RESISTING SYSTEM PRESSURE (MWFRS):	POSITIVE INTERNAL PRESSURE
- WINDWARD WALL	13.5 PSF
- LEEWARD WALL	-16.0 PSF
- SIDE WALL	-20.7 PSF
- ROOF - WINDWARD	-34.2 PSF
- ROOF - LEEWARD	-20.7 PSF

CONCRETE COVER FOR REINFORCEMENT TABLE

SUPPORTED SLABS AND JOISTS:	
FOR DRY CONDITIONS (TOP AND BOTTOM BARS):	
#14 AND #18 BARS	1 1/2 IN.
#11 BARS AND SMALLER	1 1/2 IN.
EXPOSED TO EARTH, WATER, SEWAGE OR WEATHER, OR OVER SEWAGE:	
#5 BARS AND SMALLER	1 1/2 IN.
#6 THROUGH #18 BARS	2 IN.

BEAMS AND COLUMNS:	
FOR DRY CONDITIONS:	
STIRRUPS, SPIRALS AND TIES	1 1/2 IN.
PRINCIPAL REINFORCEMENT	2 IN.
EXPOSED TO EARTH, WATER, SEWAGE OR WEATHER	
STIRRUPS AND TIES	2 IN.
PRINCIPAL REINFORCEMENT	2 1/2 IN.

WALLS:

FOR DRY CONDITIONS:	
#11 BARS AND SMALLER	1 1/2 IN.
#14 AND #18 BARS	1 1/2 IN.
CIRCULAR TANKS WITH RING TENSION	2 IN.
EXPOSED TO EARTH, WATER, SEWAGE OR WEATHER:	
	2 IN.

FOOTINGS AND BASE SLABS:

FORMED SURFACES AND BOTTOMS BEARING ON CONCRETE WORK MAT	2 IN.
UNFORMED SURFACES AND BOTTOMS IN CONTACT WITH EARTH	3 IN.
TOP OF FOOTINGS	2 IN.
OVER TOP OF PILES	3 IN.

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100 WEST ERIE STREET
PAINESVILLE, OHIO 44077

CITY OF CANTON
SUGAR CREEK
WATER TREATMENT PLANT
FILTER BACKWASH
DECHLORINATION FACILITY

NO.	DESCRIPTION	REVISIONS	
		DATE	

JOB NO: PR58982

DATE: JAN. 2021

DESIGNED BY: ABP

DRAWN BY: ABP

CHECKED BY: CMS

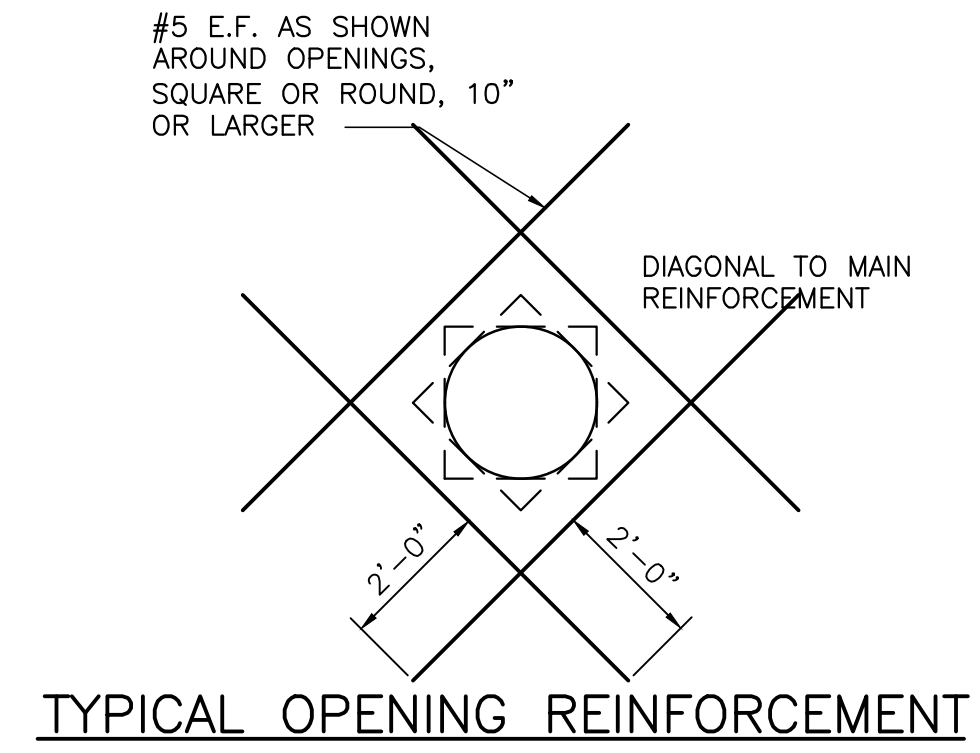
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SCALE: NONE

STRUCTURAL STD
CONC DETLS. GEN
NOTES, DESIGN
CRITERIA

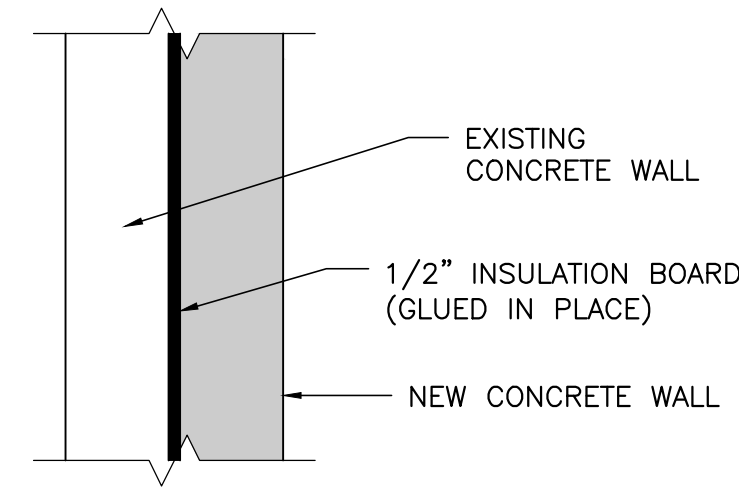
8

SHEET: 8 OF 19



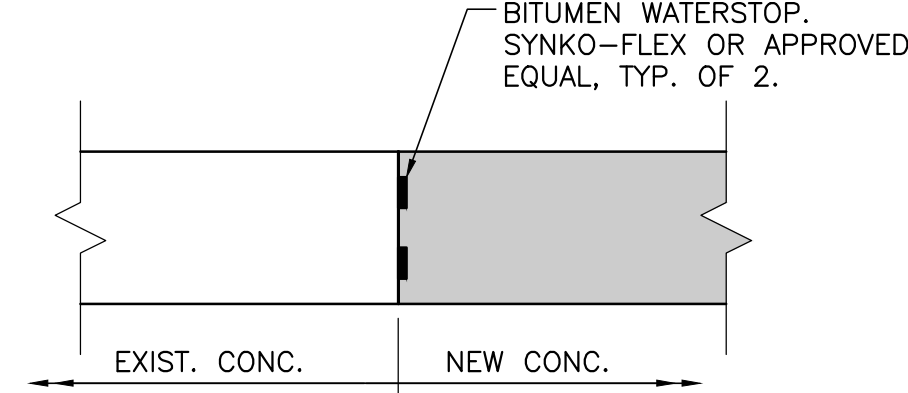
TYPICAL OPENING REINFORCEMENT

12



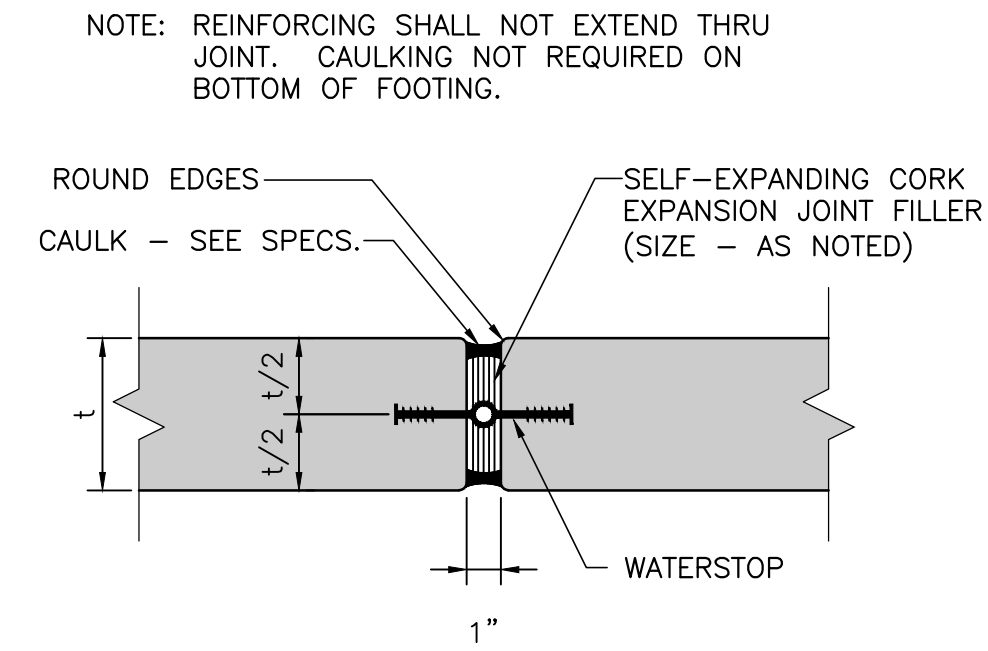
BOND BREAK DETAIL

11



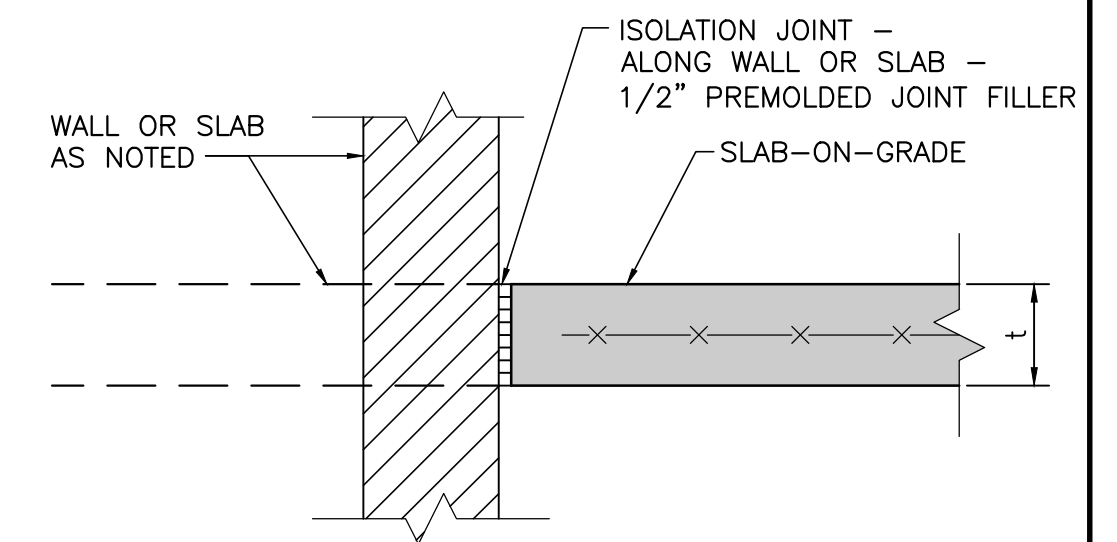
(NEW CONCRETE TO EXISTING CONCRETE)
TYPICAL JOINT DETAIL

10



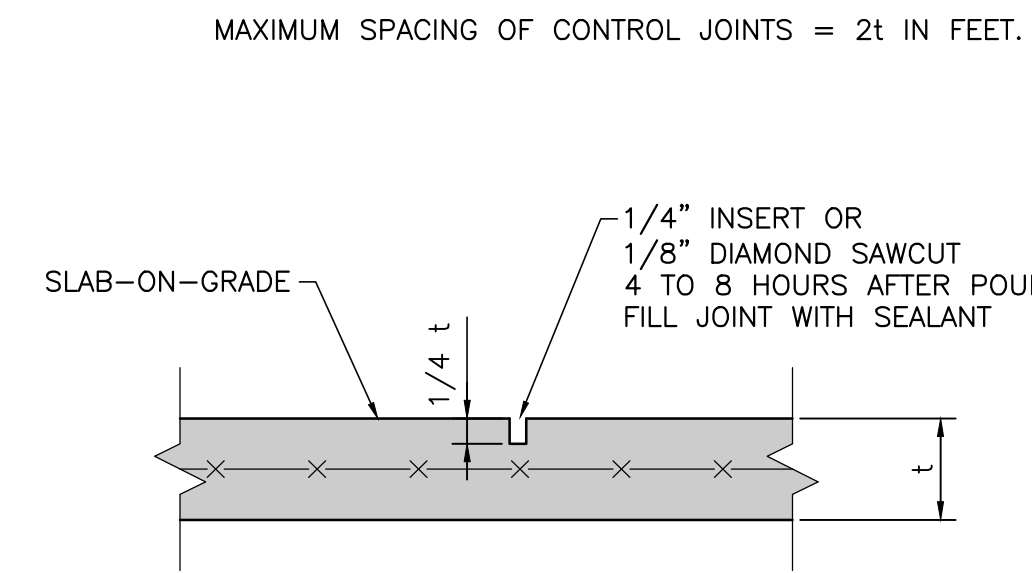
(IN NEW CONCRETE SLABS & WALLS)
TYPICAL EXPANSION JOINT DETAIL

09



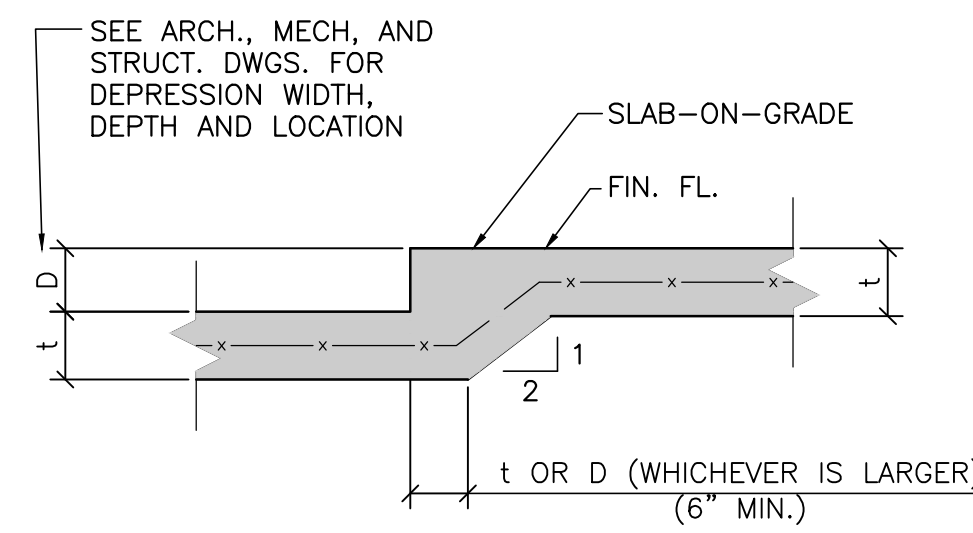
(I.J.)
TYPICAL WALL ISOLATION JOINT DETAIL

08



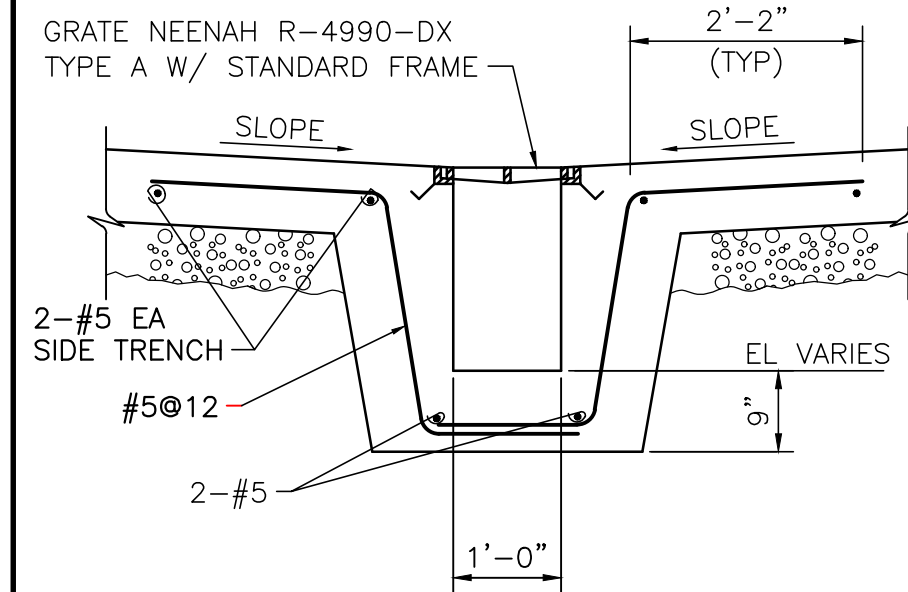
(C.J.)
TYPICAL CONTROL JOINT DETAIL
SAWCUT SLAB AS SOON AS CONDITIONS PERMIT ACCESS TO SLAB.

07



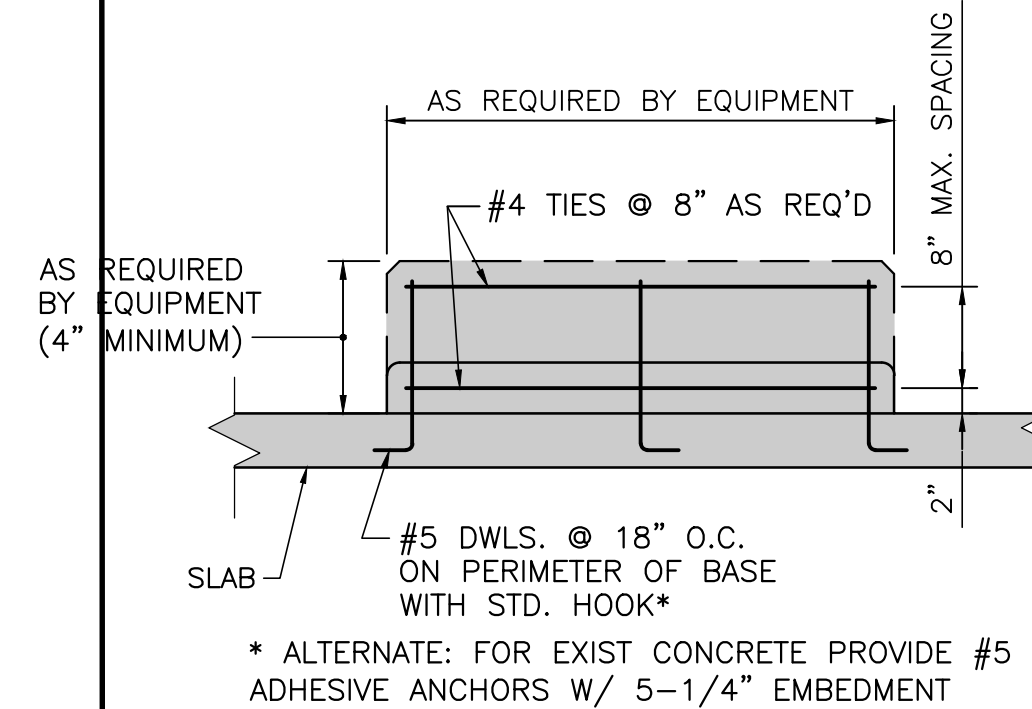
TYPICAL SLAB DEPRESSION DETAIL

06



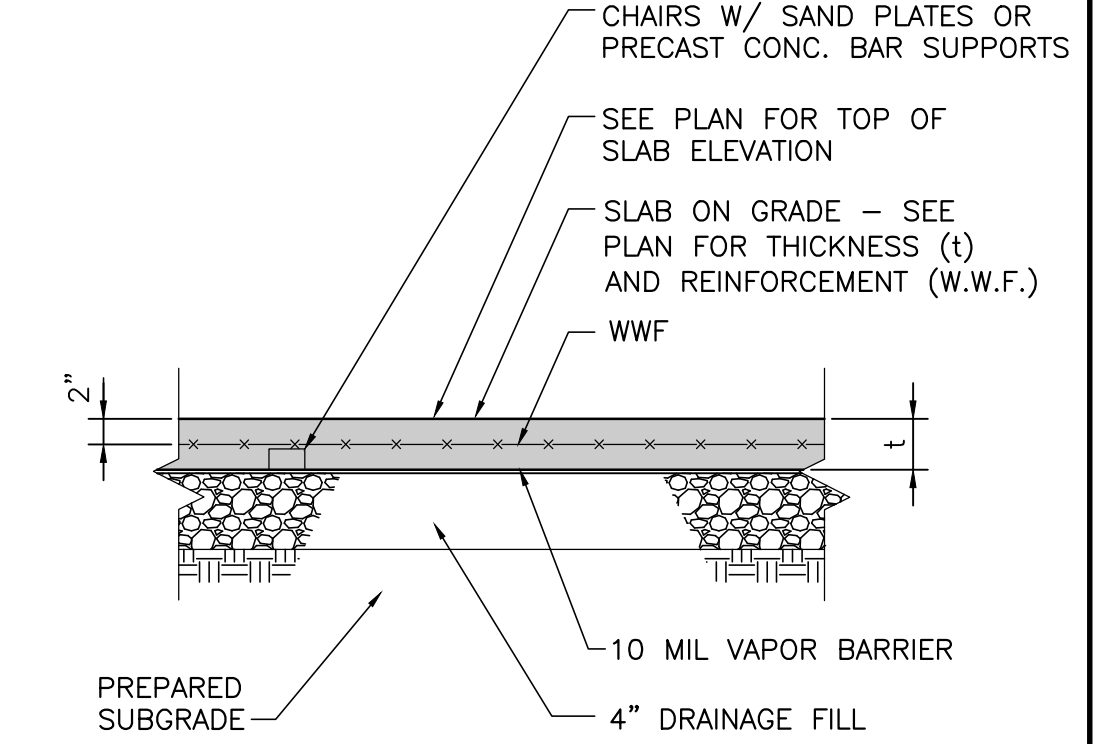
TYPICAL TRENCH DRAIN DETAIL

05



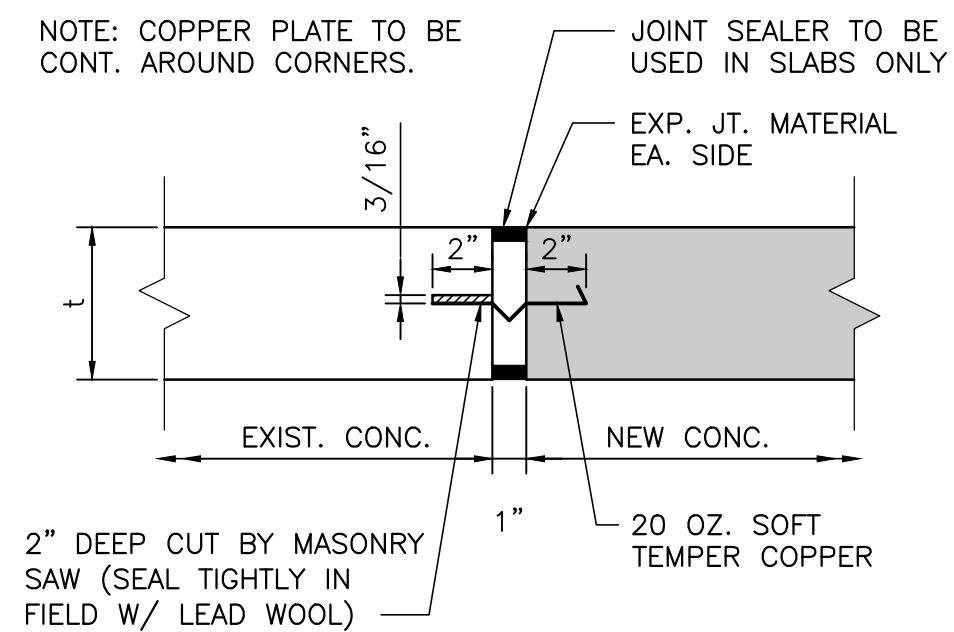
* ALTERNATE: FOR EXIST CONCRETE PROVIDE #5 ADHESIVE ANCHORS W/ 5-1/4" EMBEDMENT
TYPICAL EQUIPMENT BASE

04



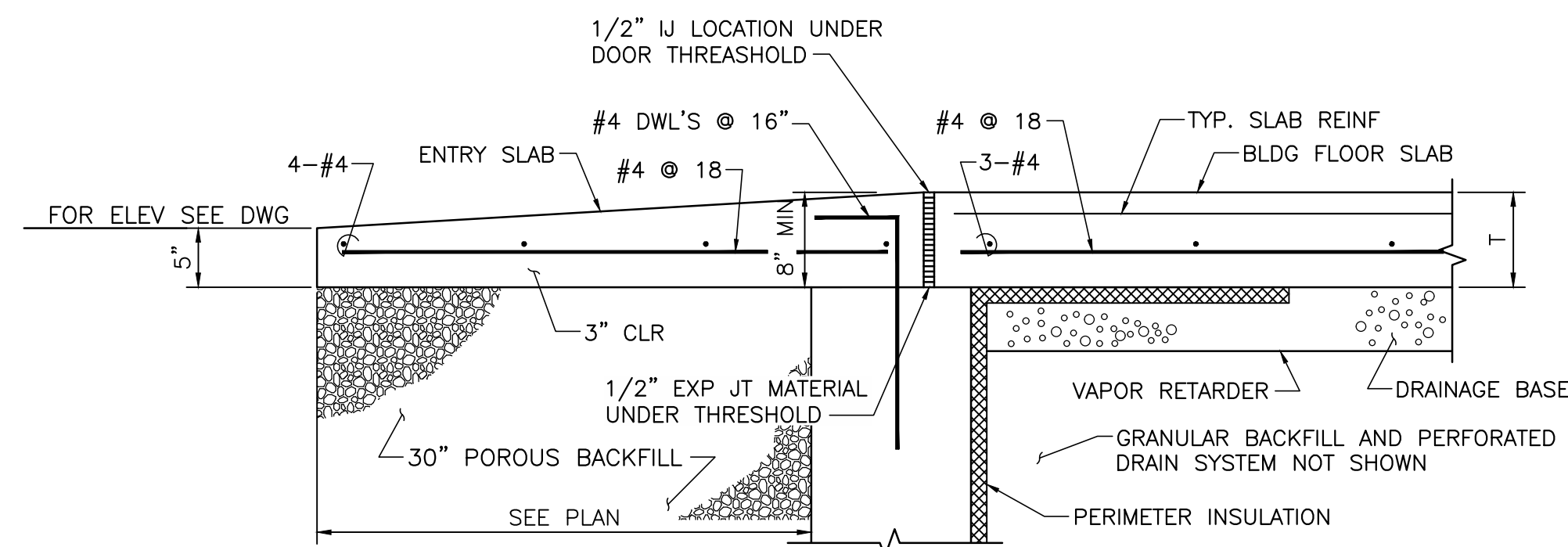
TYP. SLAB-ON-GRADE CONSTRUCTION

03



(NEW CONCRETE TO EXISTING CONCRETE)
TYPICAL EXPANSION JOINT DETAIL

02



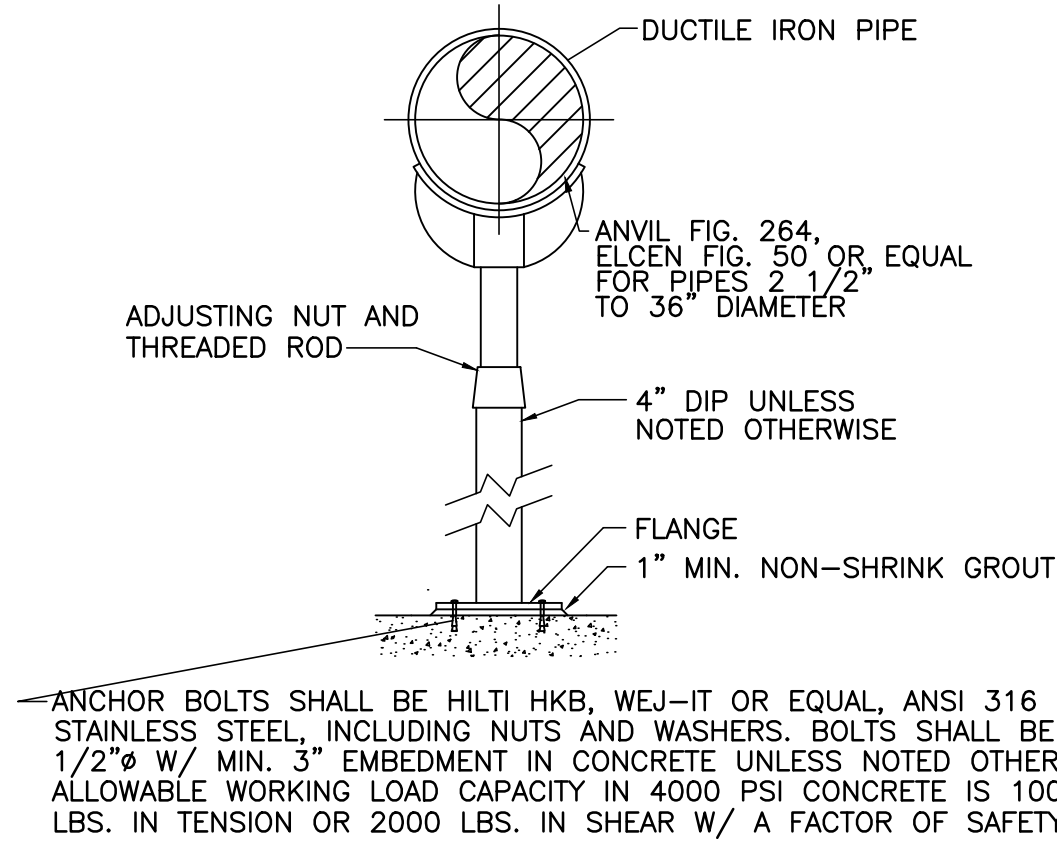
TYPICAL SECTION AT ENTRY DOOR

01

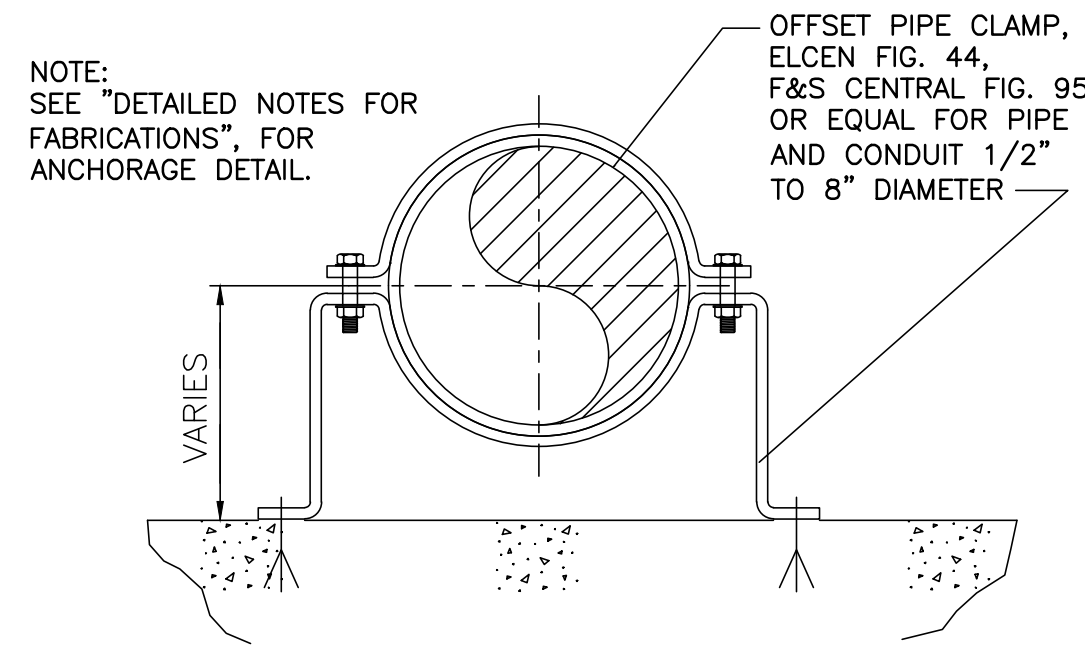
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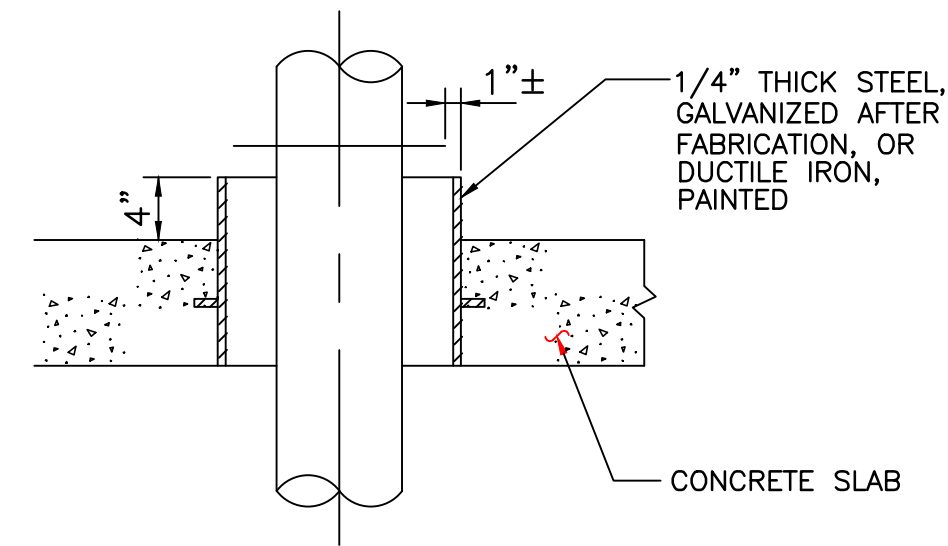
STANDARD CONCRETE DETAILS



PIPE SUPPORT, STEEL ADJUSTABLE SADDLE TYP
SCALE: NONE 10



PIPE CLAMP, OFFSET TYPE
SCALE: NONE 09

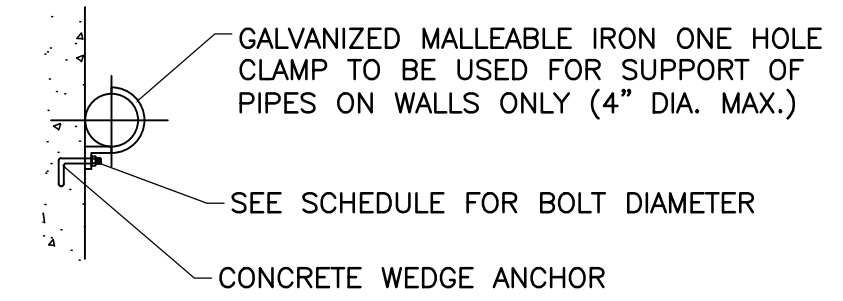


PIPE SUPPORT THRU SLAB
SCALE: NONE 08

DETAILED NOTES FOR FABRICATIONS:

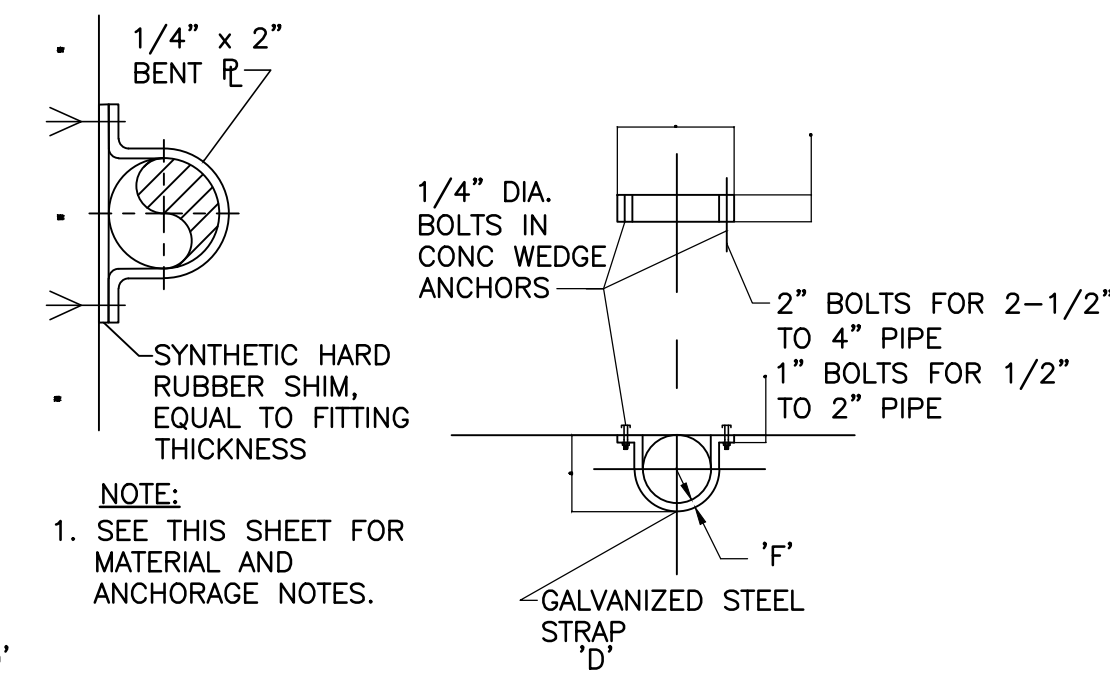
- MATERIALS: MISCELLANEOUS METAL FABRICATIONS SHALL BE WELDED CONSTRUCTION, STEEL OR ALUMINUM. 1/4-INCH THICK, UNLESS NOTED OTHERWISE, WITH CONTINUOUS ALL AROUND 1/4-INCH WELDED CONNECTIONS. STEEL SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION. ALUMINUM SHALL BE COATED WITH TWO COATS OF EPOXY ON SURFACES IN CONTACT WITH CONCRETE OR MASONRY.
- ANCHORAGE: ANCHOR BOLTS SHALL BE HILTI HKB, WEJ-IT OR EQUAL, ANSI 316 STAINLESS STEEL INCLUDING NUTS AND WASHERS. ANCHOR BOLTS SHALL BE 1/2-INCH DIAMETER WITH 4-INCH EMBEDMENT IN CONCRETE, UNLESS NOTED OTHERWISE. ALLOWABLE WORKING LOAD CAPACITY IN 4000 PSI CONCRETE IS 1000 POUNDS IN TENSION OR 2000 POUNDS IN SHEAR WITH A FACTOR OF SAFETY.

DETAILED FABRICATION NOTES
SCALE: NONE 07



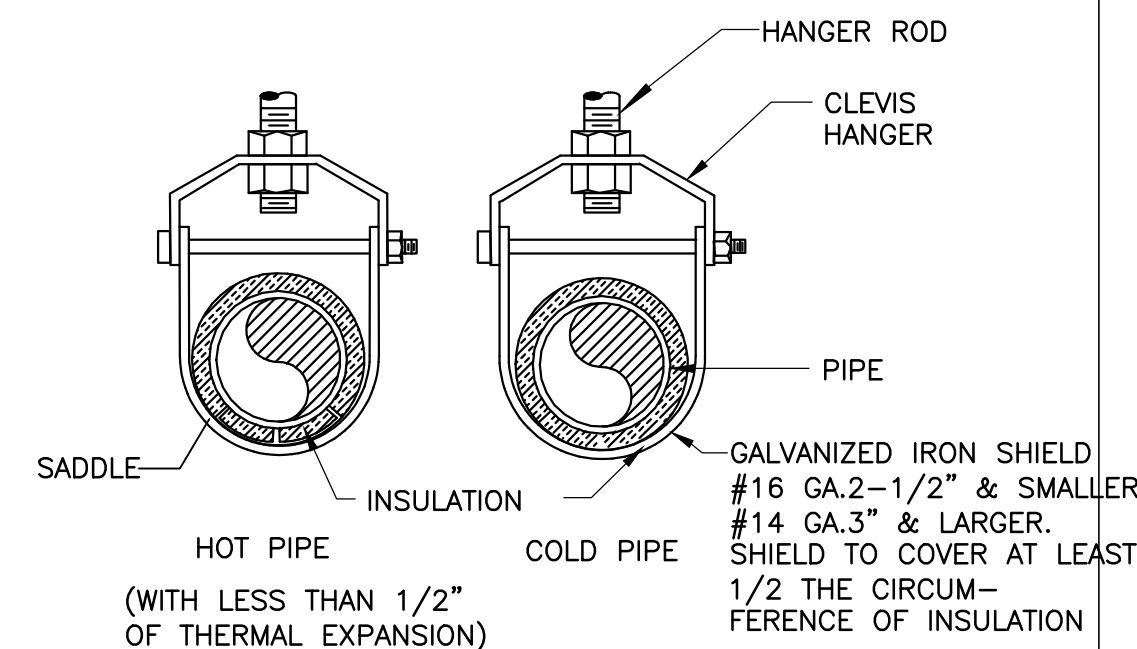
PIPE SIZE	BOLT DIA	PIPE SIZE	BOLT DIA
1/2"	1/4"	2"	5/8"
3/4"	1/4"	2-1/2"	5/8"
1"	1/4"	3"	5/8"
1-1/4"	3/8"	3-1/2"	5/8"
1-1/2"	3/8"	4"	5/8"

TYPICAL WALL CLAMP DETAIL
SCALE: NONE 06

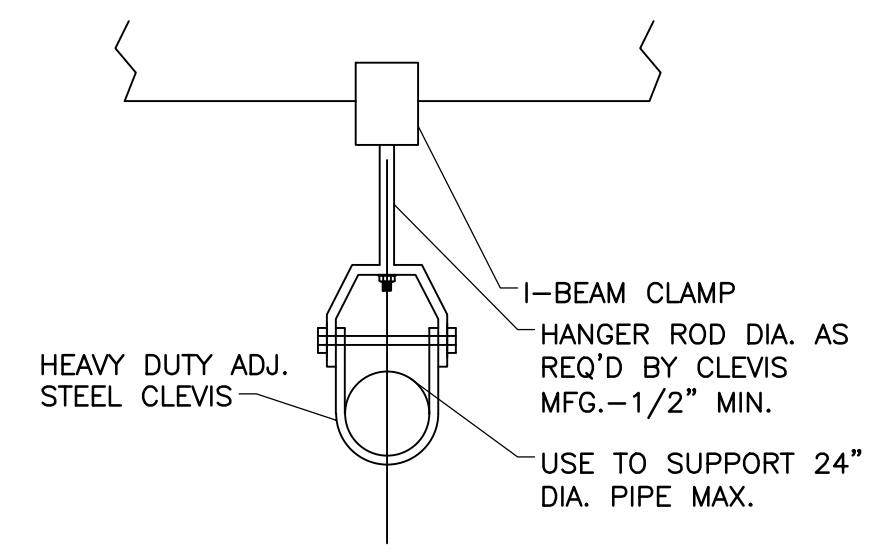


PIPE SIZE	A	B	F	PIPE SIZE	A	B	F
1/2"	3-9/16"	7/8"	3/16"	2"	5-3/4"	1"	1/4"
3/4"	3-7/8"	7/8"	3/16"	2-1/2"	6-1/4"	2"	1/4"
1"	4-1/8"	7/8"	3/16"	3"	6-7/8"	2"	1/4"
1-1/4"	4-9/16"	7/8"	3/16"	3-1/2"	7-3/8"	2"	1/4"
1-1/2"	5-3/16"	1"	1/4"	4"	8"	2"	1/4"
				6"-8"	D+4"	3"	1/4"
				10"-12"	D+4"	4"	1/4"

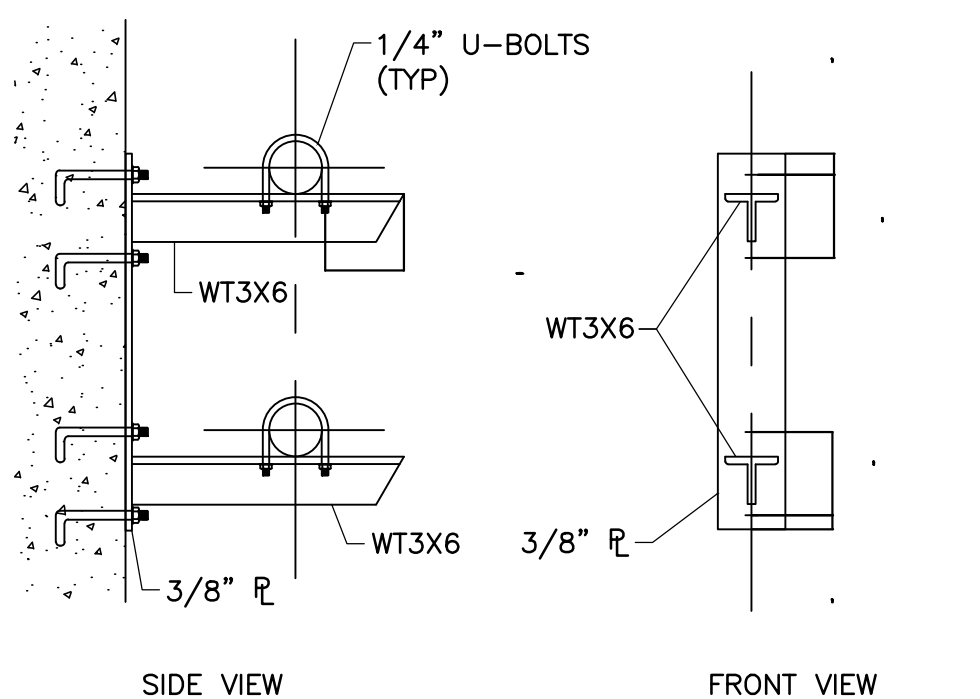
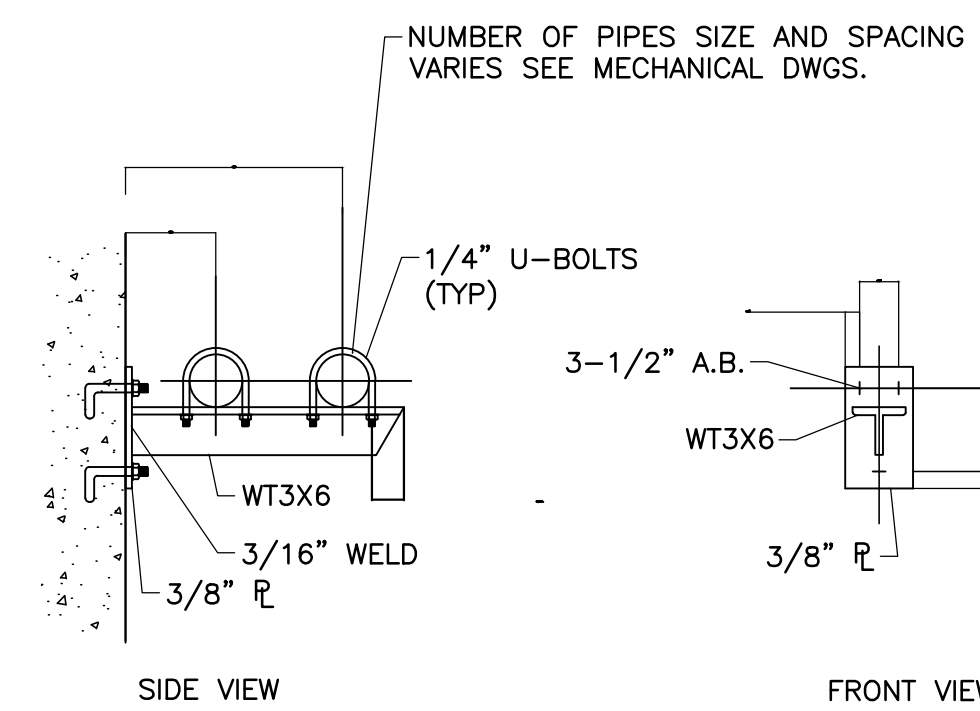
TYPICAL CEILING DETAIL
SCALE: NONE 03



TYPICAL HANGER FOR INSULATED PIPE
SCALE: NONE 05



TYPICAL HANGER DETAIL
SCALE: NONE 04



TYPICAL BRACKET DETAIL
SCALE: NONE 01

TYGON TUBING AND CARRIER PIPE

A. TYGON XL-60 TUBING FOR PERISTALTIC PUMPS.
TUBING SHALL BE DESIGNED FOR USE IN PERISTALTIC PUMP APPLICATIONS. TYGON-BRAND TUBING PUMP TUBING SHALL BE DESIGNED TO PROVIDE A MINIMUM PUMP LIFE OF 500 HOURS CONTINUOUS USE. CONTRACTOR SHALL PROVIDE ONE 50-FOOT ROLL OF TUBING FOR MEET REQUIREMENTS FOR USE WITH THE SODIUM BISULFITE PUMPS SPECIFIED ON THE CONTRACT DRAWINGS FOR THIS PROJECT.

TUBING SHALL HAVE THE FOLLOWING CHARACTERISTICS:

- LOW EXTRACTABLES
- FLEXIBLE AND EXHIBIT SUPERIOR FLEX LIFE.
- UV AND OZONE AND OXYGEN RESISTANT.
- DUROMETER HARDNESS OF (SHORE A): 60
- SUITABLE FOR TEMPERATURE RANGES OF -87 TO +250 DEGREES FAHRENHEIT.
- SHALL MEET FDA AND NSF 51 STANDARDS.
- WALL THICKNESS SHALL BE MINIMUM OF 1/16" AND RATED FOR MINIMUM 10 PSI AT 73 DEGREES F.
- PROVIDE IN UN CUT ROLLS WITH 50 FEET OF TUBING (TOLERANCE +/- 6" PER ROLL)

B. CHEMICAL SOLUTION TUBING - POLYPROPYLENE TUBING
POLYPROPYLENE TUBING SHALL BE PROVIDED TO CARRY SODIUM BISULFITE SOLUTION (35% STRENGTH) UNDER PRESSURE FROM THE PERISTALTIC PUMP DISCHARGE TO THE POINT OF APPLICATION AT THE LOCATIONS SHOWN ON THE PLANS STANDARD BARBED FITTINGS WITH 316 SS BANDS SHALL BE USED TO JOINT THE 1000-FOOT LONG LENGTHS OF TUBING. TUBING SHALL BE RESISTANT TO ACIDS, AND ALKALIS AND SUITABLE FOR THE INTENDED USE DESCRIBED ABOVE.

- TUBING SHALL BE NSF 51/61 LISTED
- NATURAL TRANSLUCENT TUBING SHALL BE PROVIDED TO ALLOW THE VISUAL INSPECTION OF THE CONTENTS. (BLACK TUBING, ALTHOUGH UV RESISTANT IS NOT REQUIRED FOR THIS BURIED APPLICATION).
- FLEXIBLE, ODORLESS, TASTELESS, AND NON-TOXIC AND EXHIBIT SUPERIOR FLEX LIFE.
- UV AND OZONE AND OXYGEN RESISTANT.
- SHALL BE NSF 51/61 LISTED.
- DUROMETER HARDNESS FOR NSF APPROVED IS 76R.
- USE COMPRESSION FITTINGS DESIGNED FOR USE WITH THE I.D./O.D. SIZE OF TUBING BEING PROVIDED.
- SUITABLE FOR TEMPERATURE RANGES UP TO MAXIMUM OF +180 DEGREES FAHRENHEIT.
- I.D SHALL BE 0.500" AND O.D. SHALL BE 0.625 WALL THICKNESS SHALL BE MINIMUM OF 1/16" AND RATED FOR MINIMUM WP 87 PSI AT 73 DEGREES F.
- PROVIDE IN UN CUT ROLLS WITH 100 FEET OF TUBING (TOLERANCE +/- 6" PER ROLL)

C. CARRIER PIPE AND FITTINGS - CORRUGATED PIPE AND FITTINGS
CARRIER PIPE SHALL BE DESIGNED FOR BURIED SERVICE AND INSTALLED WITH BEDDING PER MANUFACTURER RECOMMENDATIONS TO HANDLE H2O TRUCK WHEEL LOADS WITHOUT COLLAPSE OF THE PIPE WALL. THE CORRUGATED SINGLE WALL POLYETHYLENE PIPING IN ROLLS OR PIPE LENGTHS GREATER THAN 20 FEET TO MINIMIZE THE NUMBER OF JOINTS AND FITTING S REQUIRED TO INSTALL THE CARRIER PIPE AS SHOWN ON THE PLANS. ALL SECTIONS SHALL BE JOINED WITH PREFABRICATED PIPE CONNECTORS OR FITTINGS TO PROVIDE WATERTIGHT CONNECTIONS. PIPE SHALL BE LAID ON CONSTANT SLOPE AND OPEN AT THE DISCHARGE END SO THAT ANY MOISTURE, CONDENSATION, OR LEAKAGE DRAINS TO THE LOW END WHERE THE CHEMICAL SOLUTION IS APPLIED. ONCE THE CARRIER PIPE IS INSTALLED A PULL WIRE SHALL BE USED TO PULL IN POLYETHYLENE TUBING. A SPARE PULL WIRE SHALL BE LEFT IN THE CARRIER PIPE FOR FUTURE USE TO REMOVE AND/OR REINSTALL THE TUBING WITHOUT REMOVAL OF THE CARRIER PIPE. PIPE SHALL BE PROVIDED AND INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS FOR MATERIALS AND INSTALLATION.

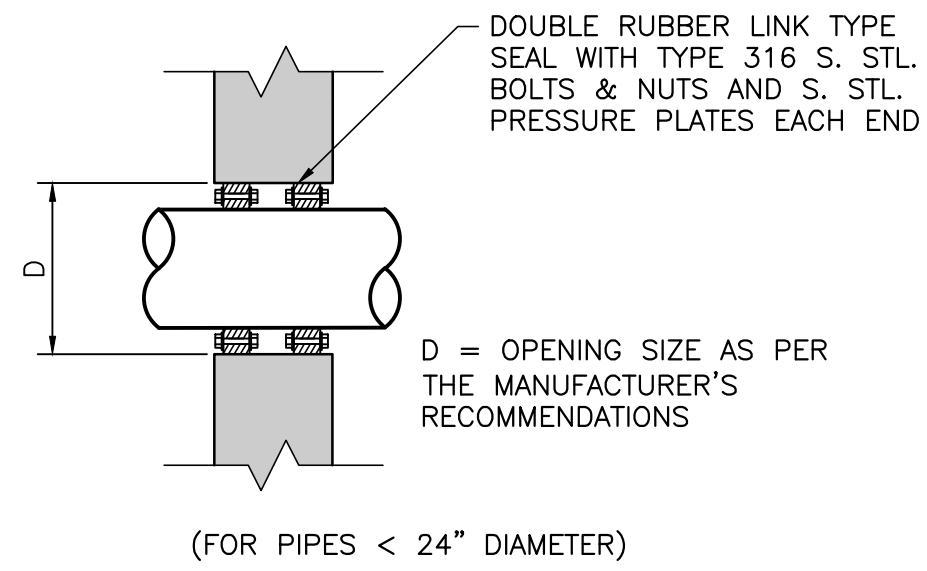
STANDARDS FOR QUALITY ASSURANCE/QUALITY CONTROL.

- AASHTO M252: STANDARD SPECIFICATION FOR CORRUGATED POLYETHYLENE DRAINAGE PIPE: 3" - 10" (76.2MM - 254.0MM)
- ASTM D2321: STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY-FLOW APPLICATIONS
- ASTM D3212: STANDARD SPECIFICATION FOR JOINTS FOR DRAIN AND SEWER PLASTIC PIPES USING FLEXIBLE ELASTOMERIC SEALS.
- ASTM D3350: STANDARD SPECIFICATION FOR POLYETHYLENE PLASTIC PIPE AND FITTINGS MATERIALS
- ASTM F477: STANDARD SPECIFICATION FOR ELASTOMERIC SEALS (GASKETS) FOR JOINT PLASTIC PIPE
- ASTM F405: STANDARD SPECIFICATION FOR CORRUGATED POLYETHYLENE PIPE AND FITTINGS: 3" - 6" (76.2MM - 152.4M)
- MANUFACTURER: PIPE SHALL BE AS MANUFACTURED BY PACIFIC CORRUGATED PIPE, ADS, OR APPROVED EQUAL.

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STANDARD PROCESS PIPING DETAILS



TYPICAL PIPE CLOSURE EXISTING WALLS AND SLABS

07

STRINGERS, HEADERS, & CHAN. SUPPORTS

MATERIAL	SECTION	MAXIMUM SPAN
ALUMINUM	C12x7.41	12'-6"
FRP	10x2 3/4"x1/2" CHANNEL	9'-0"

PLATFORM SUPPORT CHANNELS AND BEAMS

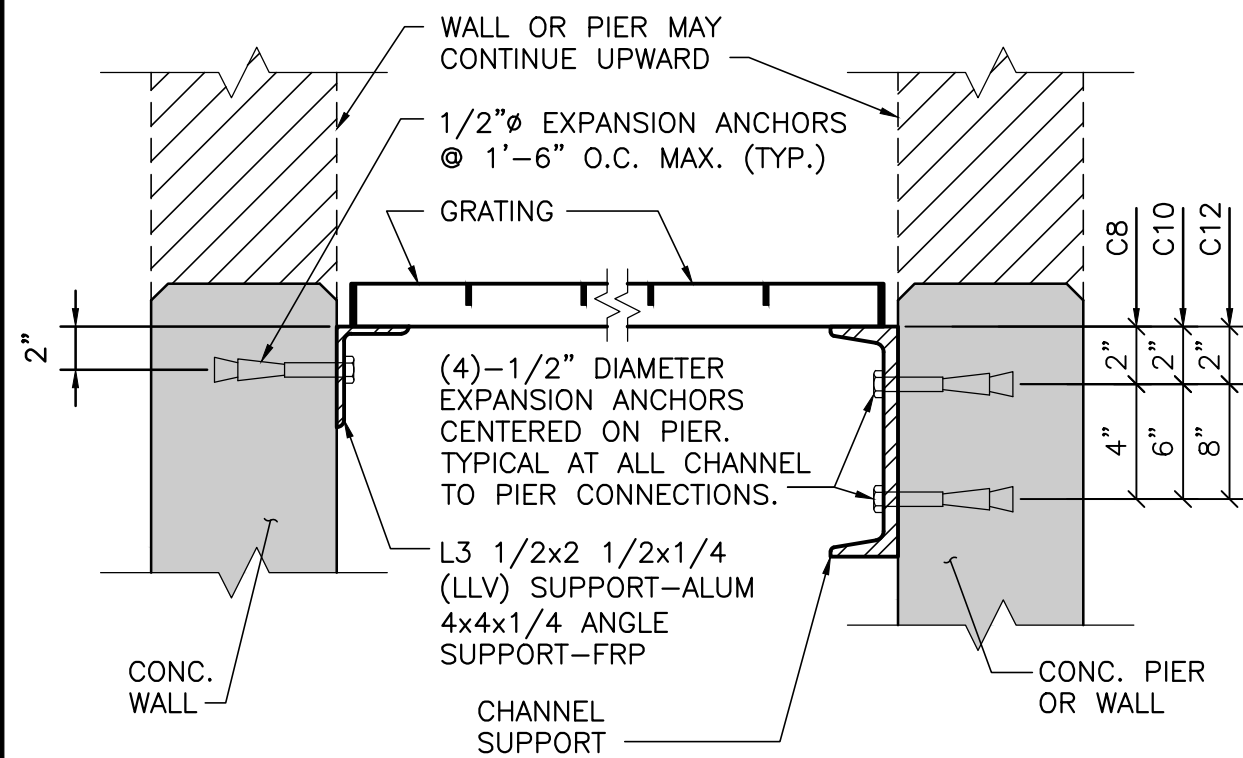
4'-0" WIDE PLATFORMS ASSUMED		
ALUMINUM	C12x7.41	10'-0"
	I 12x11.0	12'-8"
	C10x5.28	8'-6"
	I 10x8.76	11'-3"
	C8x6.48	7'-4"
	I 8x6.35	9'-3"
FRP	10x2 3/4"x1/2" CHANNEL	10'-0" (LAT. BR. @ 5')
	12x12x1/2 WIDE FLANGE	17'-0" (LAT. BR. @ 14')

06

STAIR, GRATING, PLATE & CONNECTION NOTES:

- ALL DETAILS THIS SHEET ARE SIMILAR FOR ALUMINUM, & FIBER REINFORCED POLYMER COMPOSITE MATERIALS (FRP). ALL FRAMING ELEMENTS SHOWN IN EACH DETAIL MUST BE OF THE SAME MATERIAL.
- DESIGN LOADS:
GRATING & PLATES: 250 PSF LL DEFLECTION $\leq L/160$
ALL STAIR FRAMING: 150 PSF LL
STAIR TREADS: LL ABOVE + 300 LB CONCENTRATED LOAD
GUARDRAILS: 50 PLF ANY DIRECTION @ TOP OR 200# CONC LOAD ANY DIRECTION @ TOP
- ALL ALUMINUM STRUCTURAL FRAMING SHAPES AND PLATES SHALL BE ALLOY 6061-T6, U.N.O.
- ALL FRP STRUCTURAL FRAMING SHAPES AND PLATES SHALL BE DYNAFORM, OR EXTREN, OR APPROVED EQUAL PULTRUDED FIBERGLASS VINYLESTER RESIN AND MOLDED THERMOPLASTIC SHAPES.
- ALL ALUMINUM GRATING SHALL BE ALLOY 6063 WITH SERRATED TOP SURFACE.
- ALL FRP GRATING SHALL BE MOLDED OR PULTRUDED FIBERGLASS WITH NON-SKID GRIT TOP SURFACE.
- ALL ALUMINUM STAIR TREADS SHALL BE ALLOY 6063 GRATING WITH SERRATED TOP SURFACE AND ABRASIVE NOSING.
- ALL FRP STAIR TREADS SHALL BE MOLDED OR PULTRUDED FIBERGLASS WITH NOSING AND WITH NON-SKID GRIT AFFIXED TO THE TOP SURFACE.
- ALL ALUMINUM GUARDRAILS SHALL BE TYPE 6063-T5 OR T6. ALL ALUMINUM POSTS SHALL BE TYPE 6063-T6. ALL ALUMINUM HANDRAILS SHALL BE EXTRUDED ALUMINUM.
- ALL FRP GUARDRAILS, POSTS, & HANDRAILS SHALL BE PULTRUDED FIBERGLASS VINYLESTER RESIN AND MOLDED THERMOPLASTIC SHAPES.
- ALL FRAMING CONNECTIONS REQUIRE A MINIMUM OF TWO 5/8" DIA. TYPE 304 S. STL. BOLTS WITH STANDARD HOLES.
- ALL CONCRETE ANCHORS SHALL BE 3/4" DIA. TYPE 304 S. STL. WEDGE STYLE EXPANSION ANCHORS WITH 4 3/4" MIN. EMBEDMENT. USE RAWL-STUD OR HILTI KWIK BOLT, U.N.O.
- ALL MASONRY ANCHORS SHALL BE 3/4" DIA. TYPE 304 S. STL. DROP-IN TYPE EXPANSION ANCHORS. USE RAWL HOLLOW SET DROP-IN, U.N.O.
- ALL ALUMINUM STAIR STRINGERS, PLATFORM BEAMS, HEADERS, AND CHANNEL SUPPORTS SHALL BE C12 x 7.41, U.N.O.
- ALL FRP STAIR STRINGERS, PLATFORM BEAMS, HEADERS, AND CHANNEL SUPPORTS SHALL BE C14 x 3 1/2 x 3/4, U.N.O.

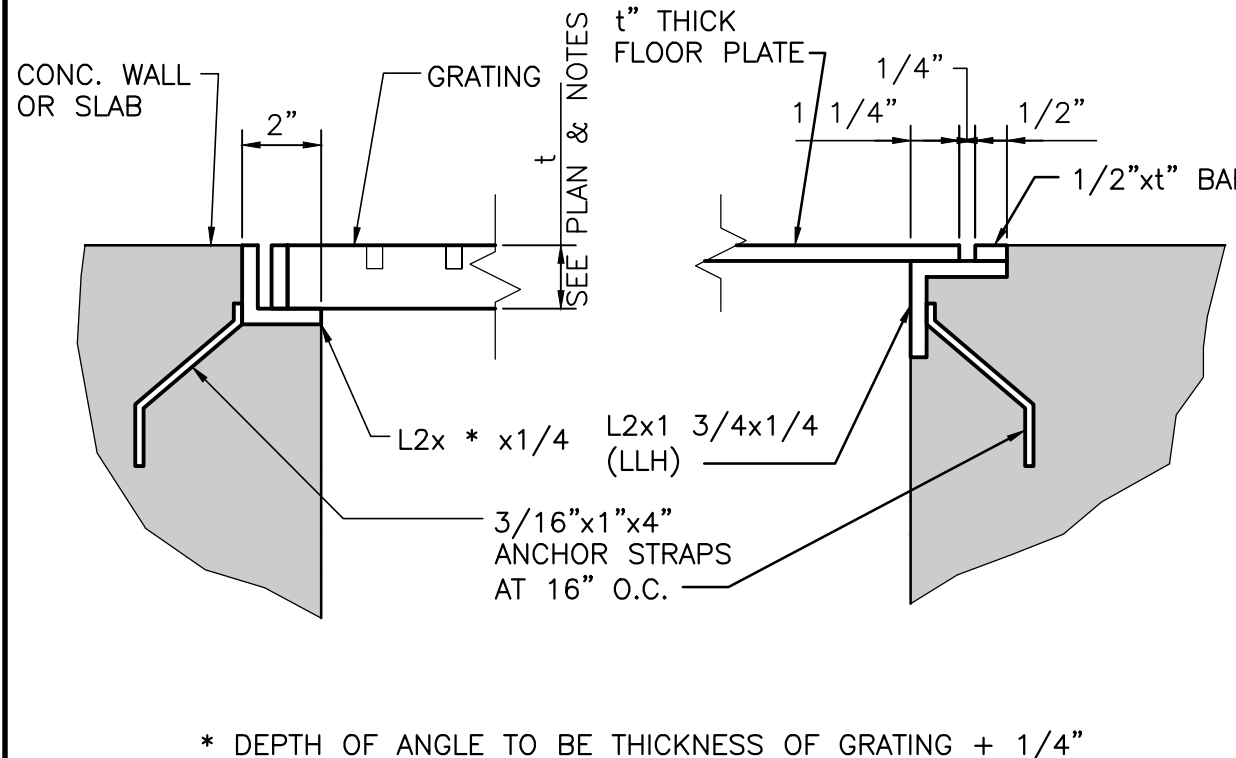
03



GRATING SUPPORT DETAIL

PLATE SUPPORT SIMILAR

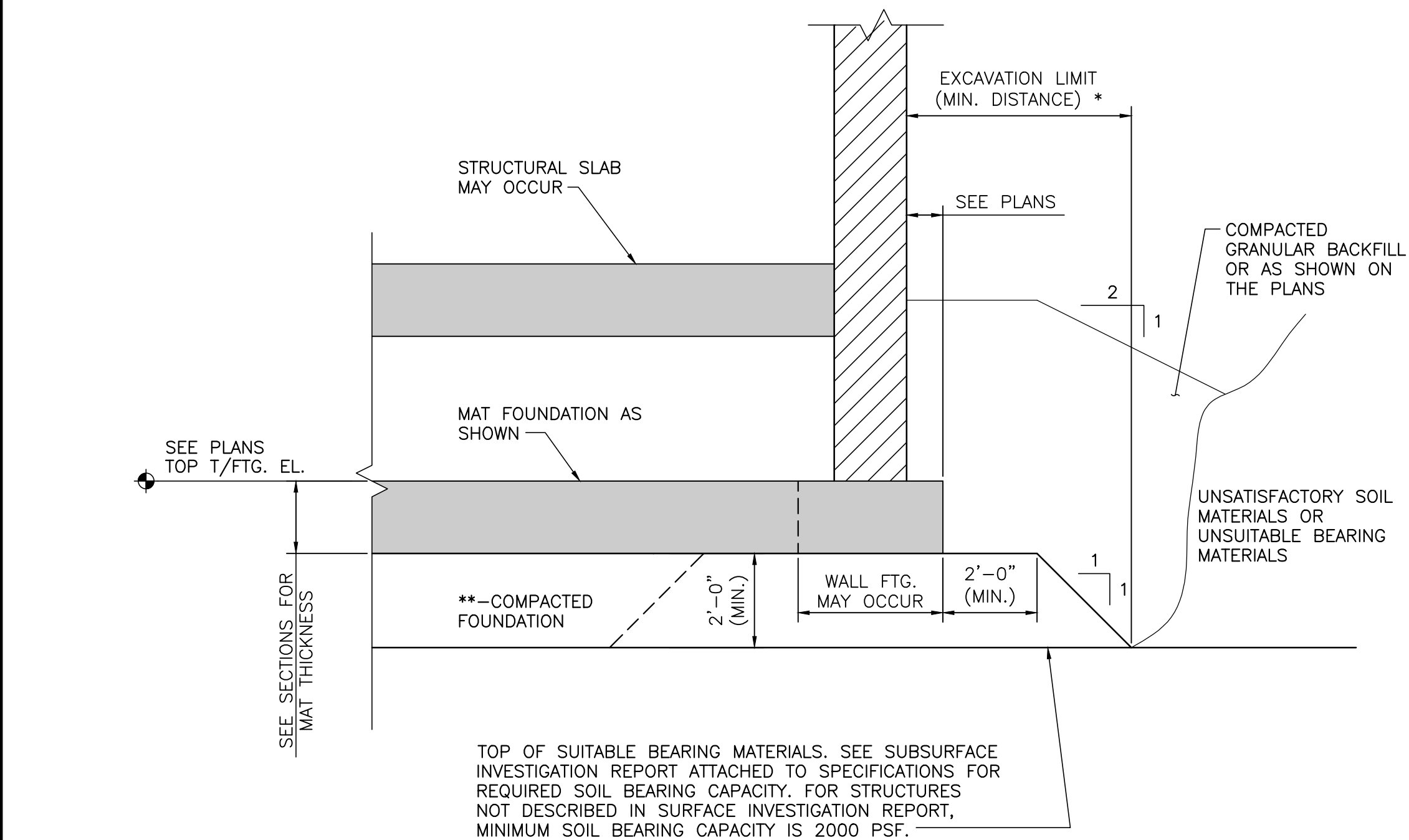
05



GRATING/FLOOR PLATE SUPPORT DETAIL

* DEPTH OF ANGLE TO BE THICKNESS OF GRATING + 1/4"

04

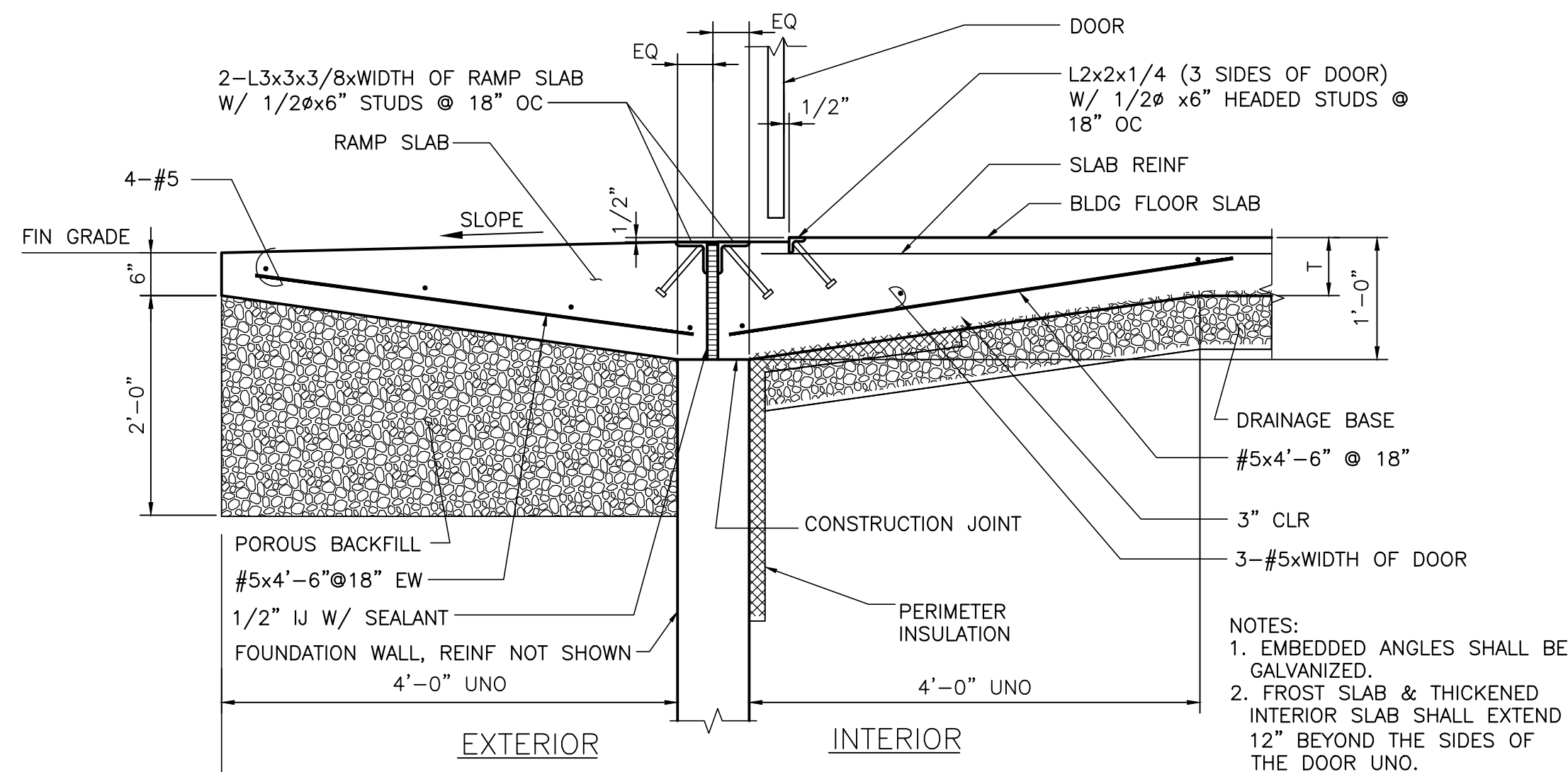


TYPICAL EXCAVATION AND FILL DETAIL

* IN ALL AREAS DESIGNATED TO RECEIVE FOUNDATION MATERIAL, NO EXCAVATION OF EXISTING MATERIAL SHALL BE MADE UNTIL THE EXISTING MATERIAL HAS BEEN INSPECTED AND AUTHORIZED FOR REMOVAL BY THE ENGINEER/ARCHITECT. DEPTH OF REMOVAL SHALL BE AS DIRECTED AND AUTHORIZED BY THE ENGINEER/ARCHITECT.

** COMPACTED FOUNDATION IS NOT REQUIRED IF SUITABLE BEARING MATERIALS ARE ENCOUNTERED AT BOTTOM OF FOUNDATION ELEVATION.

02



TYPICAL SECTION AT OVERHEAD DOOR

01

BURGESS & NIPLÉ
100 WEST ERIE STREET
PAINESVILLE, OHIO 44077

CITY OF CANTON
SUGAR CREEK
WATER TREATMENT PLANT
FILTER BACKWASH
DECHLORINATION FACILITY

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MISCELLANEOUS STRUCTURAL AND ARCHITECTURAL DETAILS

STEEL CONSTRUCTION			
ITEM	TYPE OF INSPECTION	TYPE OF TEST	FREQUENCY
MATERIAL VERIFICATION OF HIGH STRENGTH BOLTS, NUTS, WASHERS AND STRUCTURAL STEEL	VISUAL	IDENTIFY ASTM DESIGNATIONS AND VERIFY COMPLIANCE WITH CONTRACT DOCUMENTS	PERIODIC
BOLTED CONNECTIONS-STEEL TO STEEL, STEEL TO CONCRETE	VISUAL IN ACCORDANCE WITH AISC SPECIFICATIONS	VERIFY CONNECTIONS ARE CONSISTENT WITH CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS	CONTINUOUS
MATERIAL VERIFICATION OF WELD FILLER MATERIALS	VISUAL	IDENTIFY AWS DESIGNATIONS AND VERIFY COMPLIANCE WITH CONTRACT DOCUMENTS	PERIODIC
WELDED CONNECTIONS	VISUAL IN ACCORDANCE WITH AWS D1.1	COMPLETE AND PARTIAL PENETRATION GROOVE WELDS >5/16" SINGLE PASS FILLET WELDS <5/16" ROOF DECK WELDS	CONTINUOUS CONTINUOUS PERIODIC PERIODIC
FABRICATORS		VERIFY EACH FABRICATOR MAINTAINS DETAILED FABRICATION AND QUALITY CONTROL PROCEDURES	

ANCHOR SYSTEMS - POST INSTALLED			
ITEM	TYPE OF INSPECTION	TYPE OF TEST	FREQUENCY
MATERIAL CERTIFICATION	VISUAL	CONFIRMATION ANCHOR AND ADHESIVE TYPE, DIMENSIONS, MATERIAL GRADE, ICC-ESR REPORT	PERIODIC
INSTALLATION	VISUAL	VERIFY COMPLIANCE WITH ICC-ESR AND INSTALLATION WITH MANUFACTURER'S WRITTEN INSTRUCTIONS	CONTINUOUS DURING TASK
TESTING	FIELD TESTING	PERFORM TENSION PULL TEST ON 10 PERCENT OF INSTALLED ADHESIVE ANCHORS	PERIODIC

CONCRETE CONSTRUCTION			
ITEM	TYPE OF INSPECTION	TYPE OF TEST	FREQUENCY
INSPECTION OF REINFORCING STEEL	VISUAL	VERIFY SIZE, COVER, LOCATION, STRENGTH, LAP LENGTHS	PERIODIC
VERIFYING USE OF APPROVED DESIGN MIX	VISUAL	ONSITE REVIEW OF BATCH TICKETS FROM TRUCKS. VERIFY TRUCK TICKETS MATCH APPROVED DESIGN.	PERIODIC
ANCHORS-CAST IN PLACE	VISUAL	VERIFY MATCH WITH CONTRACT DOCUMENTS	PERIODIC
CONCRETE SAMPLING AND TEST STRENGTH	SAMPLING BY TECHNICIAN	SAMPLE PER ASTM C172, MOLD 4 CYLINDERS PER ASTM C31	PERIODIC - SAMPLE EACH DAY OF PLACEMENT AND EVERY 100 CY AFTERWARDS
CONCRETE STRENGTH TESTS	LABORATORY STRENGTH TEST	ASTM C39	CONTINUOUS - TEST 1 CYLINDER AT 7 DAYS AND 2 AT 14 DAYS. TEST ADDITIONAL CYLINDER AS DIRECTED BY ENGINEER
SLUMP, TEMPERATURE, AIR TESTS AND SLUMP FLOW TEST	FIELD TESTING	SLUMP - ASTM C143, TEMPERATURE-ASTM C1064, AIR CONTENT-ASTM C231, C173 OR C138	PERIODIC - TEST EACH DAY OF PLACEMENT AND EVERY 100 CY AFTERWARD AND AS DIRECTED BY ENGINEER
INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TECHNIQUES	VISUAL	VERIFY CURING TECHNIQUES AS SPECIFIED	PERIODIC
INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF CONCRETE MEMBERS BEING FORMED	VISUAL	VERIFY FORMED ITEMS MATCH CONTRACT DOCUMENTS, CONSTRUCTION BULLETINS AND FIELD CHANGES	PERIODIC

SOILS AND FOUNDATIONS			
ITEM	TYPE OF INSPECTION	TYPE OF TEST	FREQUENCY
VERIFY MATERIALS BELOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE DESIGN BEARING CAPACITY	GEOTECHNICAL ENGINEER FIELD OBSERVATIONS AND TESTING	VERIFY REQUIRED BEARING CAPACITY	PERIODIC
VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL	GEOTECHNICAL ENGINEER FIELD OBSERVATIONS AND TESTING	VERIFY EXPOSED SUBGRADE AS EXPECTED PER GEOTECHNICAL REPORT	PERIODIC - PRIOR TO PLACEMENT OF CONCRETE OR FILL MATERIALS
PERFORM CLASSIFICATION AND TESTING OF CONTROLLED FILL MATERIALS	GEOTECHNICAL ENGINEER FIELD OBSERVATIONS AND TESTING	ASTM D698 (STD PROCTOR) AND VISUAL OBSERVATIONS	CONTINUOUS DURING TASK
VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF CONTROLLED FILL	GEOTECHNICAL ENGINEER FIELD OBSERVATIONS AND TESTING	ASTM D698 (STD PROCTOR) AND VISUAL OBSERVATIONS	CONTINUOUS FOR FILL BELOW STRUCTURES. MIN TWO TESTS PER LIFT FOR AREAS UP TO 4,000SF AND ONE ADDITIONAL TEST FOR EACH ADDITIONAL 2,000SF.
PRIOR TO PLACEMENT OF CONTROLLED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PROPERLY PREPARED	GEOTECHNICAL ENGINEER FIELD OBSERVATIONS AND TESTING	VERIFY PROOF ROLLING	PERIODIC

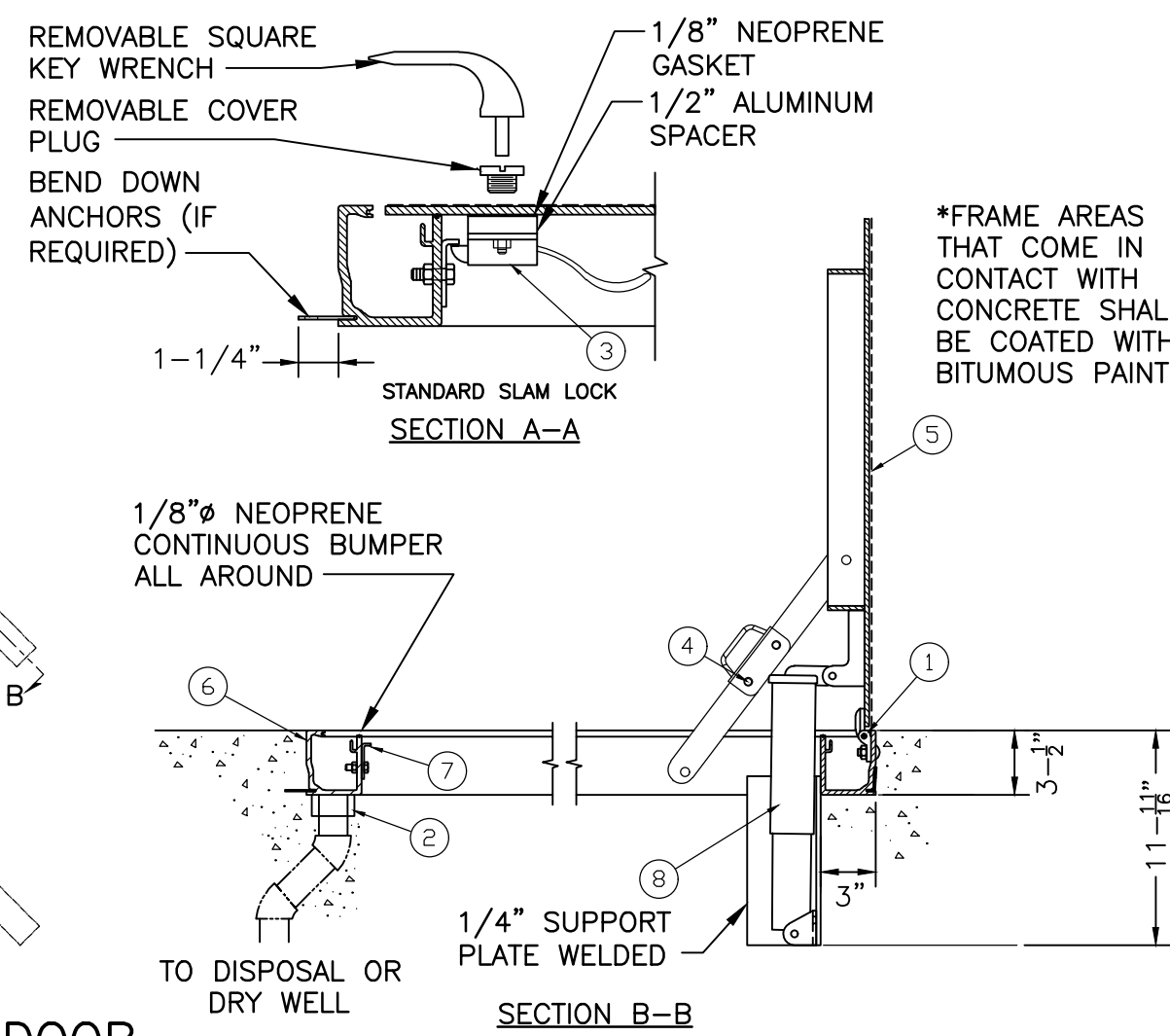
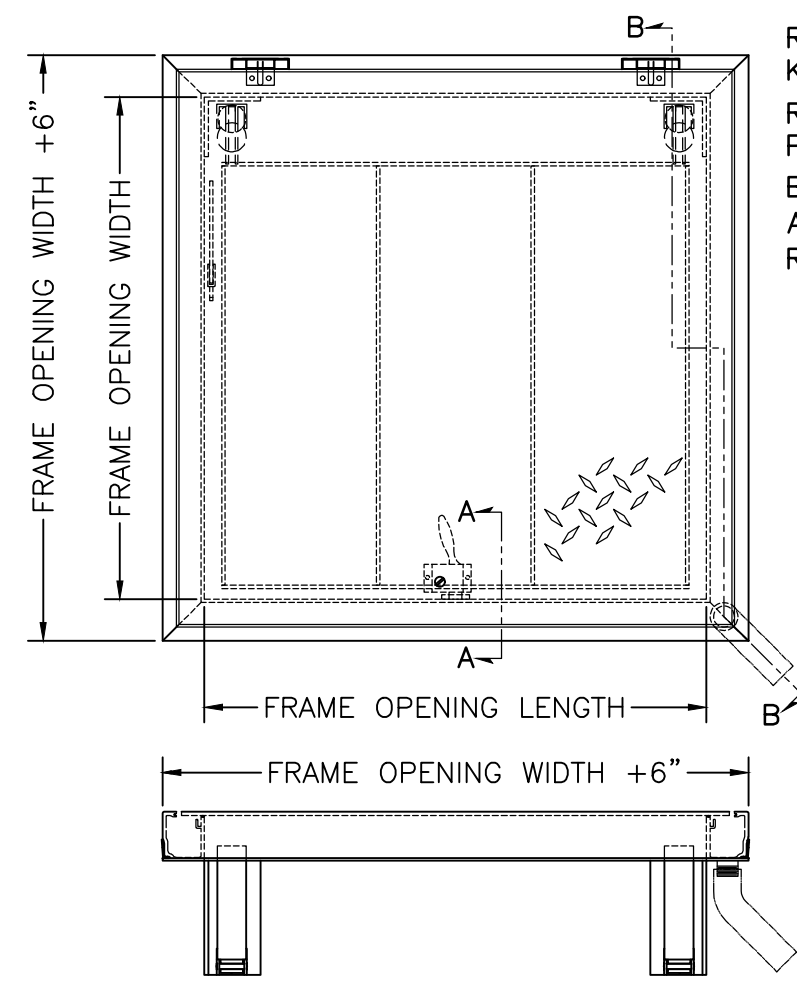
BURGESS & NIPLE
100 WEST ERIE STREET
PAINESVILLE, OHIO 44077

CITY OF CANTON
SUGAR CREEK
WATER TREATMENT PLANT
FILTER BACKWASH
DECHLORINATION FACILITY

NO.	DESCRIPTION	DATE

JOB NO: PR58982
DATE: JAN. 2021
DESIGNED BY: ABP
DRAWN BY: ABP
CHECKED BY: CMS
APPROVED BY: CMS
SCALE: NONE

STATEMENT OF SPECIAL INSPECTIONS



SPECIFICATIONS

1. BILCO HEAVY DUTY FORGED STAINLESS STEEL HINGES WITH STAINLESS STEEL PINS
2. 1-1/2" DRAIN COUPLING
3. STANDARD SLAM LOCK
4. BILCO AUTOMATIC HOLD OPEN ARM
5. 1/4" ALUMINUM DIAMOND PATTERN PLATE COVER
6. BILCO 1/4" ALUMINUM CHANNEL FRAME WITH RECESSED ANCHORS
7. STAINLESS STEEL LOCK STRIKE
8. STAINLESS STEEL SPRING LIFTING MECHANISM

SHOP FINISH:
ALUMINUM: MILL FINISH
HARDWARE: TYPE 316 STAINLESS STEEL (UNLESS OTHERWISE SPECIFIED)

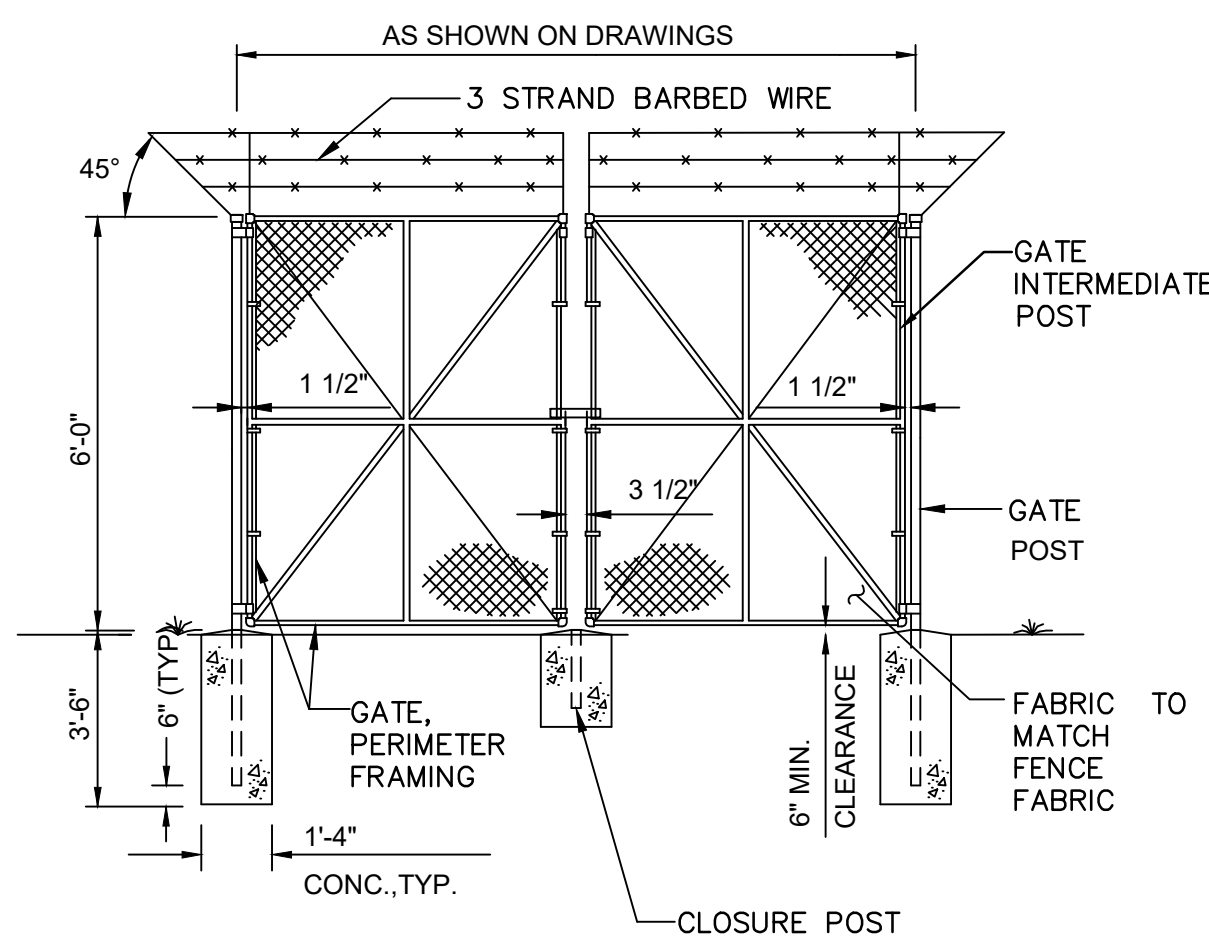
REINFORCED FOR 300 LBS. PER SQ. FT. (1464 kg. PER SQ. METER) LIVE LOAD

INSTALLER NOTES:

- A. USE CAUTION. COVER IS SPRING LOADED. DO NOT REMOVE SAFETY SHIPPING BOLT UNTIL UNIT IS TO BE INSTALLED AND IN NORMAL HORIZONTAL OPERATING POSITION.
- B. BE SURE UNIT IS SET ON SLIGHT PITCH TOWARD DRAIN CORNER.
- C. BEFORE ANCHORING IN PLACE OPEN AND CLOSE DOOR. CHECK TO SEE THAT THE DOOR IN THE CLOSED POSITION RESTS ON THE FRAME ALL AROUND. IF NOT, SHIM UNDER THE FRAME AT THE PROPER CORNER.
- D. DO NOT REDUCE 1 1/2" DRAIN PIPE TO DRY WELL OR DISPOSAL SYSTEM.
- E. BEND DOWN ANCHORS IF REQUIRED

SINGLE LEAF MANHOLE DOOR

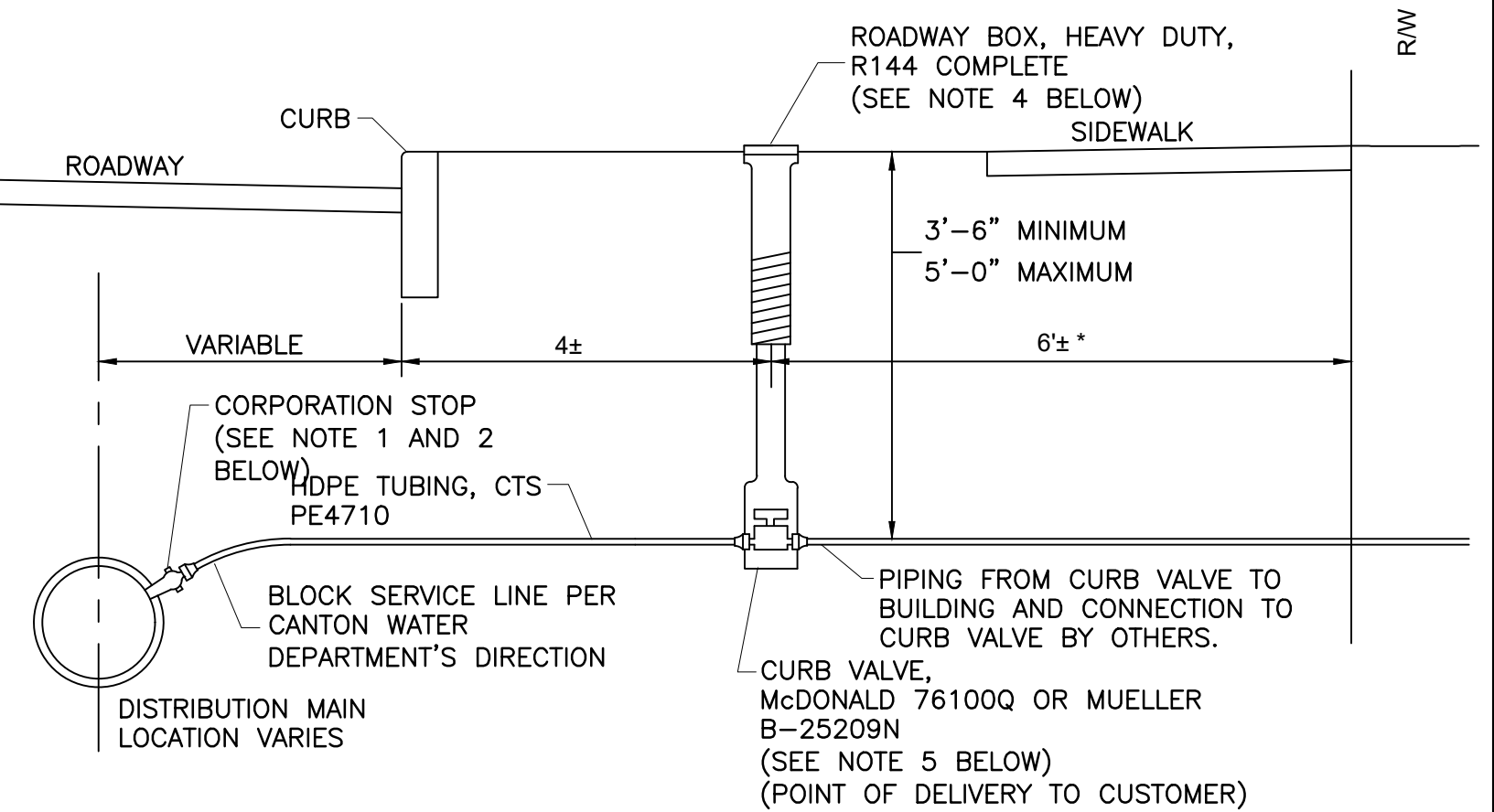
SCALE: NONE



NOTE: SEE SPECIFICATION 32 31 14

DOUBLE SWING GATE DETAIL

SCALE: NONE

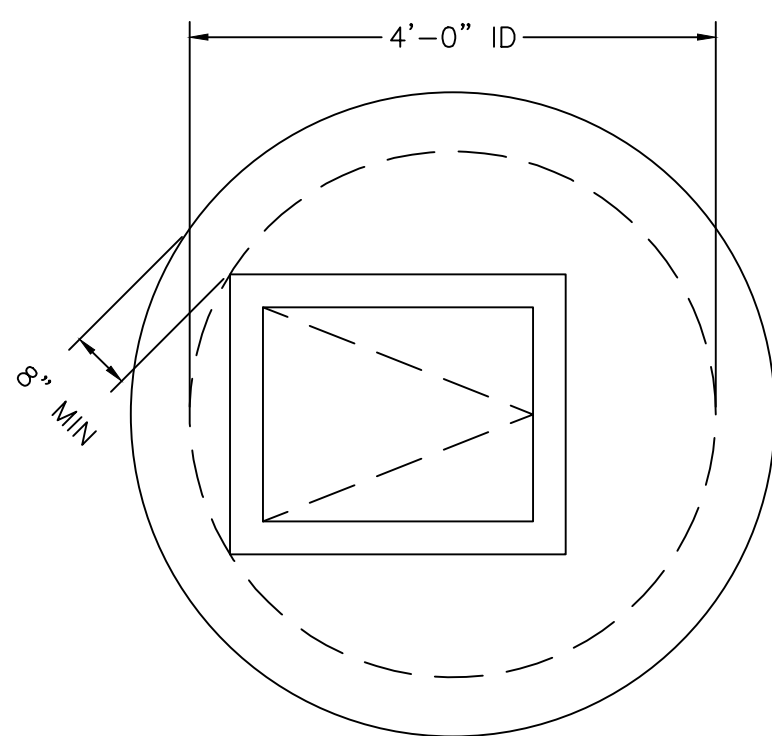


NOTES:

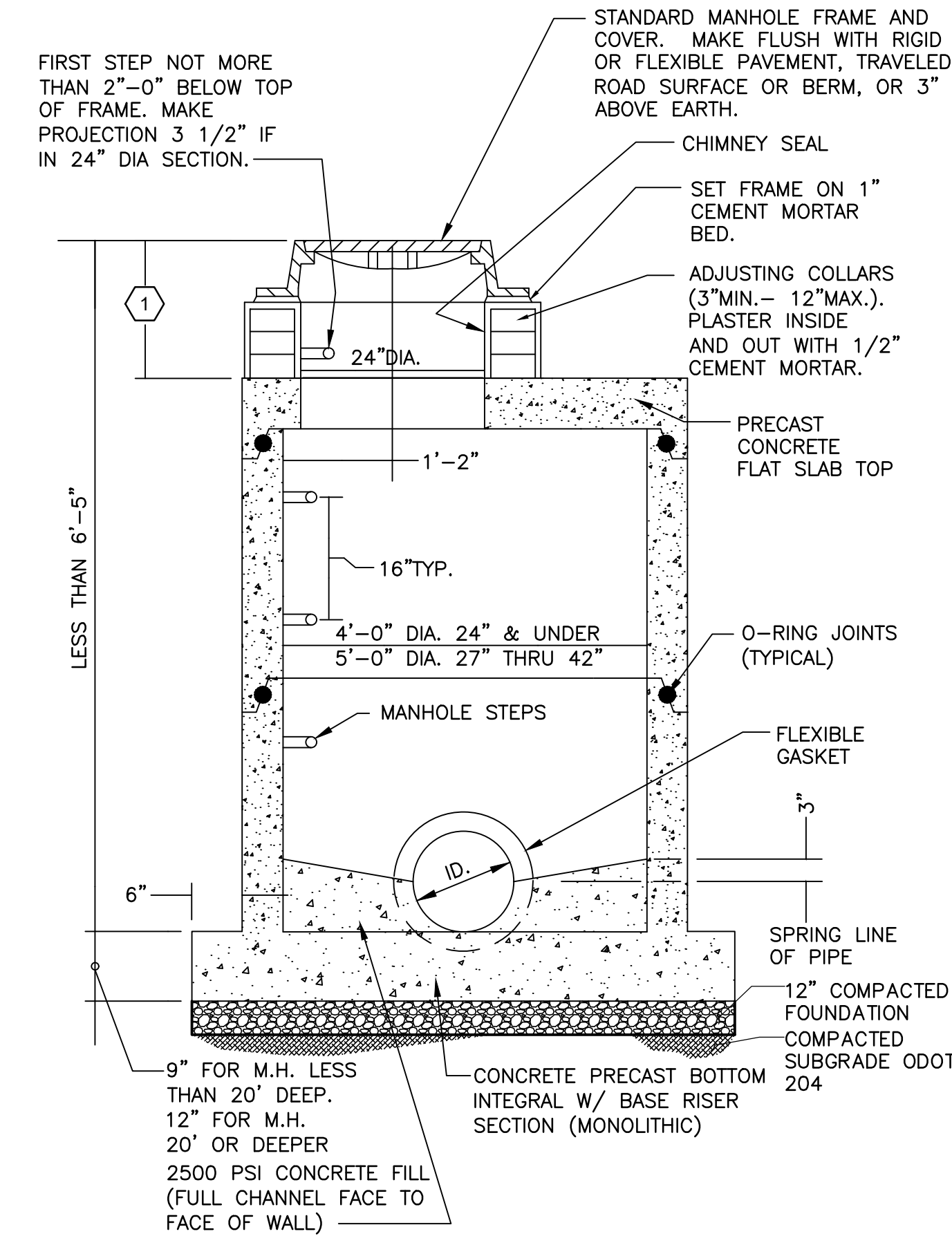
1. MANHOLES SHALL BE PERFECTLY PLUMB.
2. THOROSEAL INSIDE OF SANITARY MANHOLES ONLY, FULL DEPTH (ANY COLOR BUT GRAY).
3. ALL JOINTS AND CONNECTIONS TO BE WATER PLUGGED.
4. ALL MATERIALS SHALL BE AS LISTED IN THE SPECIFICATIONS.
5. ALL PRECAST CONCRETE SHALL BE REINFORCED IN ACCORDANCE WITH THE LATEST REVISIONS OF A.S.T.M. DESIGNATION C-478. ALL PRECAST CONCRETE SECTIONS SHALL BE MANUFACTURED AND FURNISHED AS SOLID SECTIONS WITHOUT LIFT HOLES OF ANY KIND.
6. 1-1/2" FPT DRAIN OUTLET TO SIDE ON MANHOLE LID WITH 1-1/2" CIP PIPE. CENTERLINE OF DRAIN PIPE AT 5" BELOW TOP OF MANHOLE LID.

CODED NOTE:

1. A FLUSH MOUNT FLOOR DOOR CAN BE PROVIDED WHEN NOTED ON PLANS. PROVIDE SINGLE-LEAF EMBEDDED ALUMINUM FLOOR DOOR AND FRAME WITH GUTTER AND 1-1/2" GALVANIZED IRON PIPE DRAIN TO OUTLET SIDE OF PRECAST CONCRETE LID AT 2" ABOVE FINAL GRADE.

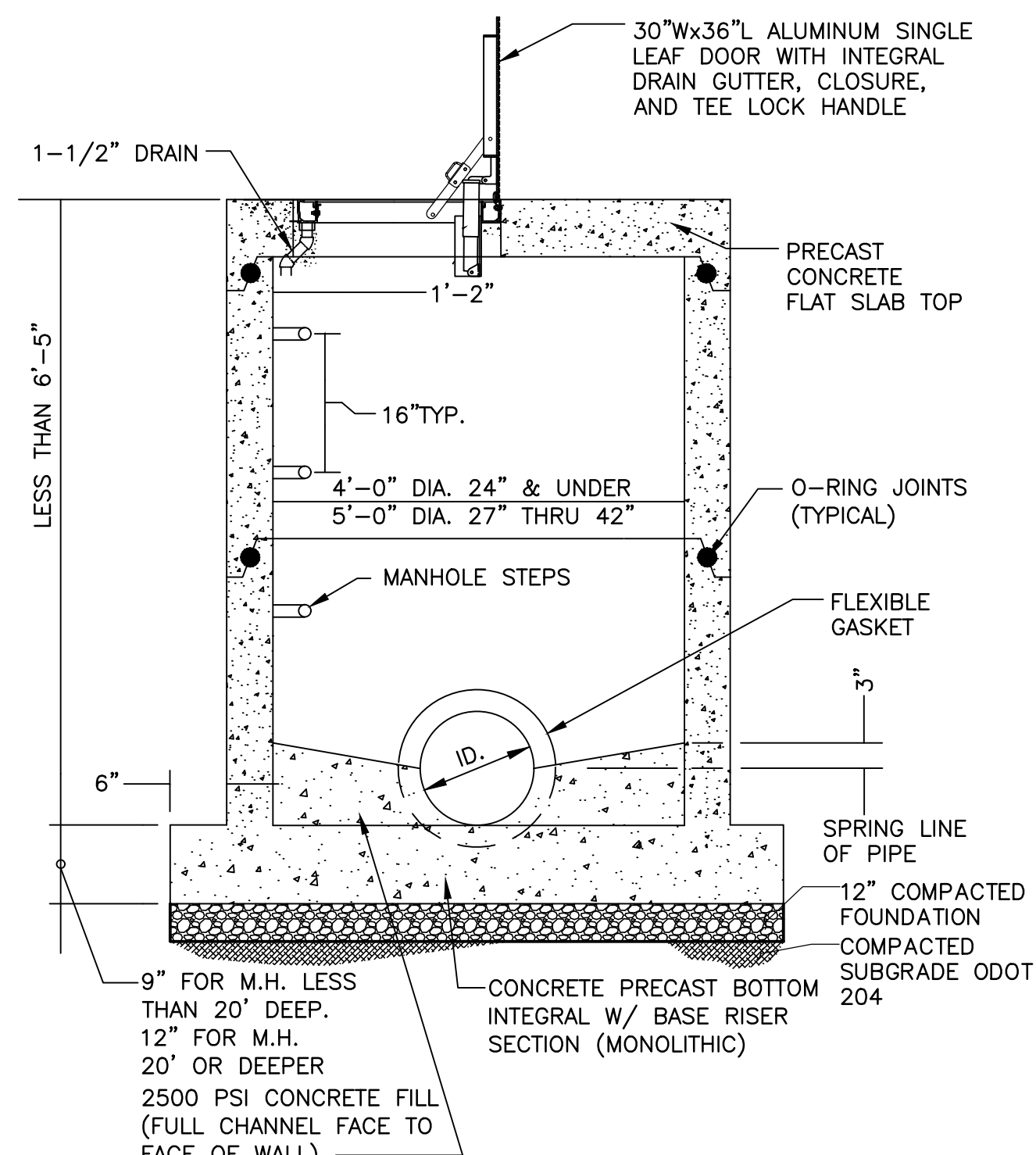


TOP PLAN



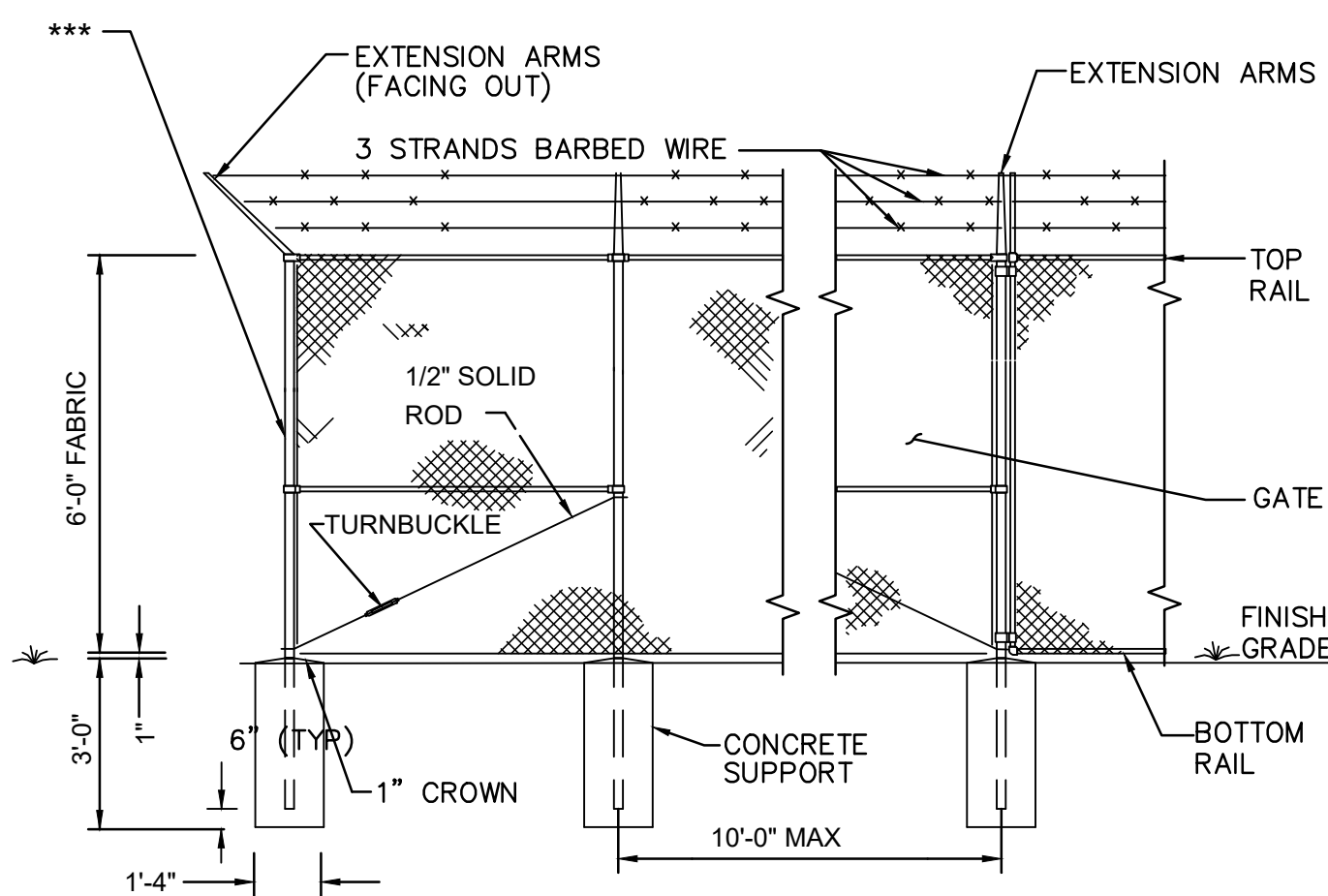
SHALLOW MANHOLE W/ CASTING

SCALE: NONE



FLAT TOP MANHOLE

SCALE: NONE

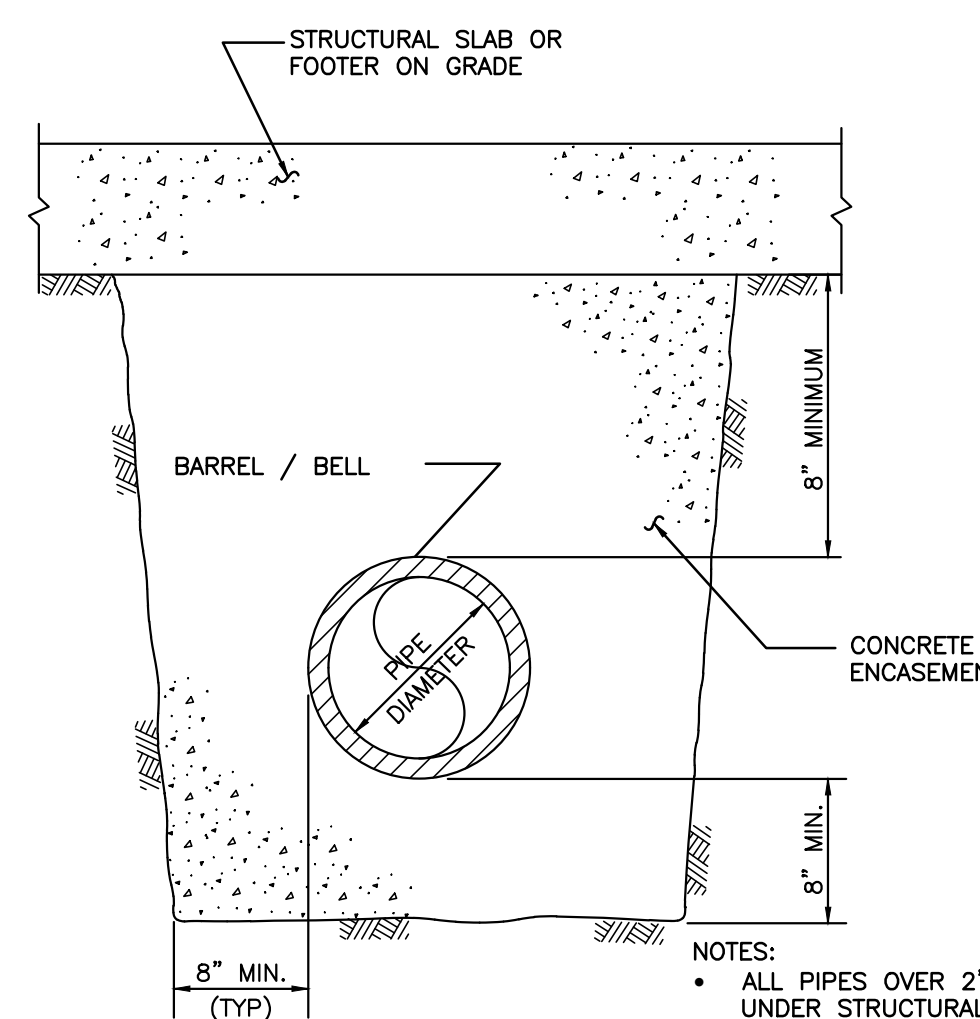


NOTE: SEE SPECIFICATION 32 31 14

CHAIN LINK FENCE DETAIL

SCALE: NONE

***LINE POST SHALL BE C-SECTION AS CALLED OUT IN TABLE 710.03-1 IN ODOT CONSTRUCTION SPECIFICATION MANUAL. END/CORNER POSTS SHALL BE GRADE 1 PIPE.



PIPE ENCASEMENT, CONCRETE

SCALE: NONE

- NOTES:
- ALL PIPES OVER 2" IN DIAMETER, UNDER STRUCTURAL SLABS AND FOOTERS ON GRADE, SHALL BE CONCRETE ENCASED TO BOTTOM OF SLAB UNLESS NOTED OTHERWISE.
 - CONCRETE ENCASEMENT SHALL BE A CLASS C DESIGN MIX IN ACCORDANCE WITH SECTION 03 30 00, "CAST-IN-PLACE CONCRETE."

NOTES:

- 1.) A 1" SERVICE ON A 6" OR 8" MAIN SHALL CONSIST OF A 3/4" TAP WITH A 3/4" X 1" CORP.
- 2.) CORPORATION STOP AND ASSEMBLY SHALL BE AS FOLLOWS:
 - 3/4" X 1" CORP. STOP ON DIP (6" AND 8" MAINS):
INSTALL AT THE 2:00 POSITION, A MUELLER B-25008 CORPORATION STOP COMPRESSION CONNECTION.
 - WITH A 3/4" X 1" CORP. STOP ON PVC C909 (6" AND 8" MAINS):
INSTALL AT THE 2:00 POSITION, A MUELLER B-25008 CORPORATION STOP COMPRESSION CONNECTION AND A FORD, STAINLESS STEEL, EPOXY COATED TAPPING SADDLE (FC202 STYLE).
 - WITH A 1" CORP. STOP ON DIP (MAINS 12" AND UP):
INSTALL AT THE 2:00 POSITION, A MUELLER B-25008 CORPORATION STOP COMPRESSION CONNECTION.
 - WITH A 1" CORP. STOP ON PVC C909 (MAINS 12" AND UP):
INSTALL AT THE 2:00 POSITION, A MUELLER B-25008 CORPORATION STOP COMPRESSION CONNECTION AND A FORD, STAINLESS STEEL, EPOXY COATED TAPPING SADDLE (FC202 STYLE).
 - WITH A 1 1/2" CORP. STOP (ALL MAIN SIZES):
INSTALL AT THE 2:00 POSITION, A MUELLER B-25008 CORPORATION STOP COMPRESSION CONNECTION AND A FORD, STAINLESS STEEL, EPOXY COATED TAPPING SADDLE (FC202 STYLE).
 - WITH A 2" CORP. STOP (ALL MAIN SIZES):
INSTALL AT A 45° ANGLE, A MUELLER H-10003 CORPORATION STOP WITH STANDARD NO LEAD BRASS 45° ELBOW AND A MUELLER H-15428 COMPRESSION MALE WITH INSERT COUPLING. ASSEMBLY SHALL ALSO CONSIST OF A FORD, STAINLESS STEEL, EPOXY COATED TAPPING SADDLE (FC202 STYLE).
- 3.) A SERVICE CLAMP MUST BE USED WHEN THE MAIN SIZE IS 2 INCH OR SMALLER.
- 4.) HEAVY DUTY VALVE BOXES, COMPLETE, MUST BE USED IN PLACE OF ROADWAY BOXES WHEN THE CURB VALVE IS LOCATED IN ROADWAYS OR ASPHALT DRIVES.
- 5.) WHEN CONNECTING A NEW 1" SERVICE TO AN EXISTING 3/4" SERVICE, THE CURB VALVE SIZE SHALL BE A 1" X 3/4" REDUCING CURB VALVE.
- 6.) BRASS REDUCING BUSHINGS OR SWIVEL ELLS WILL NOT BE ALLOWED.
- 7.) APPROVED EQUALS MAY BE USED IN PLACE OF SPECIFIED ITEMS.

TYPICAL WATER SERVICE

(C94)
REV 10/16/2020

BURGESS & NIPLE
100 WEST ERIE STREET
PAINESVILLE, OHIO 44077

CITY OF CANTON
SUGAR CREEK
WATER TREATMENT PLANT
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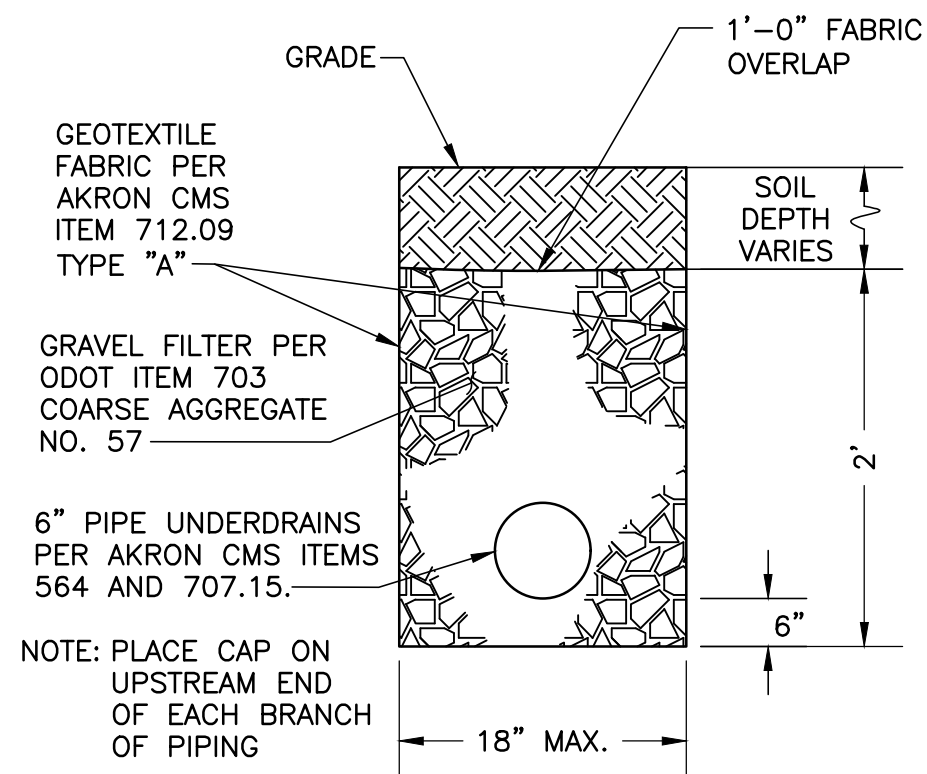
NO.	DESCRIPTION	DATE	REVISIONS

JOB NO: PR58982
DATE: JAN. 2021
DESIGNED BY: CMS
DRAWN BY: GCB
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SCALE: NONE

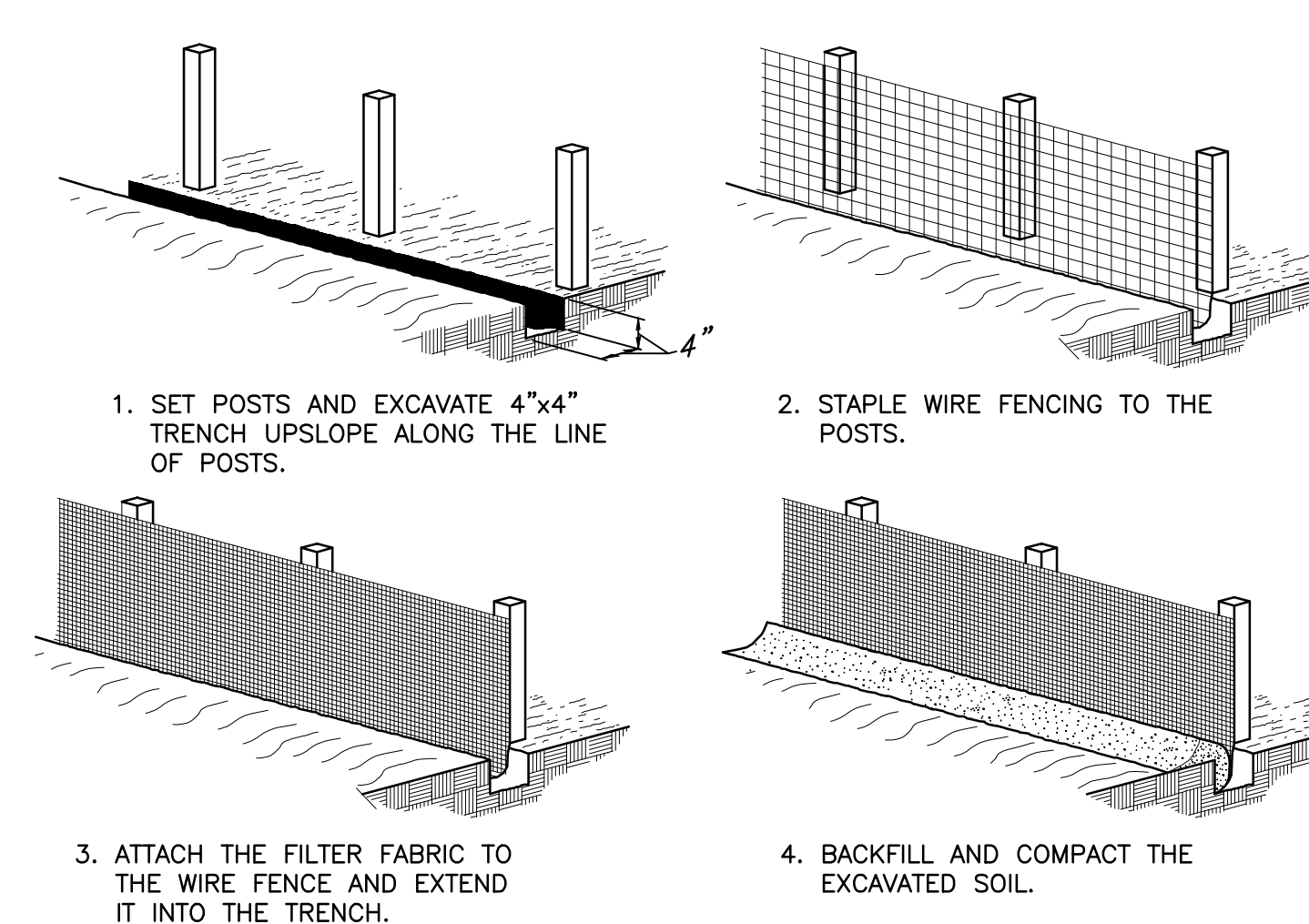
MISCELLANEOUS SITE DETAILS

STORM INLET PROTECTION NOTES

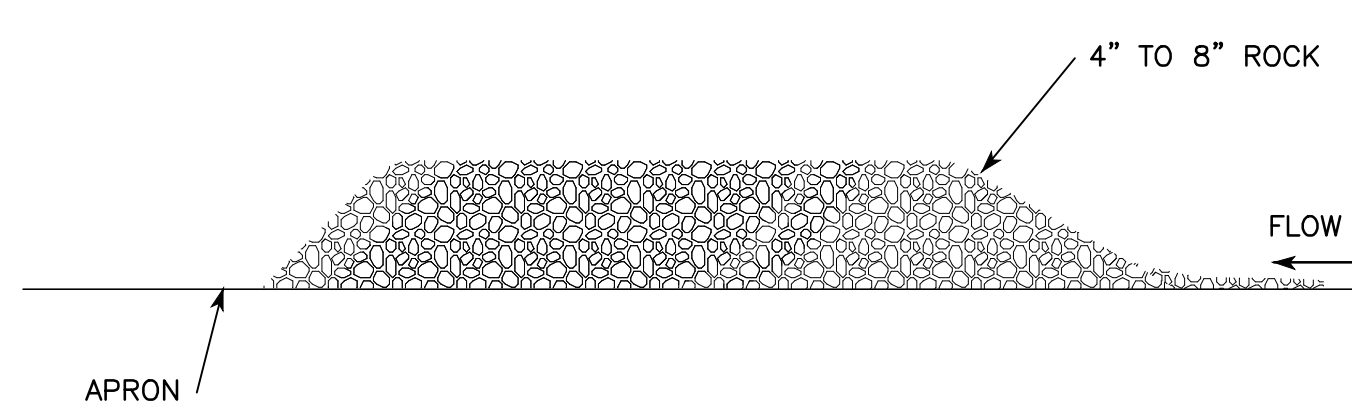
1. INLET PROTECTION SHALL BE CONSTRUCTED EITHER BEFORE UPSLOPE LAND DISTURBANCE BEGINS OR BEFORE THE STORM DRAIN BECOMES OPERATIONAL.
2. THE EARTH AROUND THE INLET SHALL BE EXCAVATED COMPLETELY TO A DEPTH OF AT LEAST 18-INCHES.
3. THE WOODEN FRAME SHALL BE CONSTRUCTED OF 2x4-IN. CONSTRUCTION-GRADE LUMBER. THE 2x4-IN. POSTS SHALL BE DRIVEN 1-FT. INTO THE GROUND AT FOUR CORNERS OF THE INLET AND THE TOP PORTION OF THE 2x4-IN. FRAME ASSEMBLED USING THE OVERLAP JOINT SHOWN. THE TOP OF THE FRAME SHALL BE AT LEAST 6-IN. BELOW ADJACENT ROADS IF PONDED WATER WOULD POSE A SAFETY HAZARD TO TRAFFIC.
4. WIRE MESH SHALL BE OF SUFFICIENT STRENGTH TO SUPPORT FABRIC WITH WATER FULLY IMPOUNDED AGAINST IT. IT SHALL BE STRETCHED TIGHTLY AROUND THE FRAME AND FASTENED SECURELY TO THE FRAME.
5. GEOTEXTILE SHALL HAVE AN EQUIVALENT OPENING SIZE OF 20-40 SIEVE AND BE RESISTANT TO SUNLIGHT. IT SHALL BE STRETCHED TIGHTLY AROUND THE FRAME AND FASTENED SECURELY. IT SHALL EXTEND FROM THE TOP OF THE FRAME TO 18-IN. BELOW THE INLET NOTCH ELEVATION. THE GEOTEXTILE SHALL OVERLAP ACROSS ONE SIDE OF THE INLET SO THE ENDS OF THE CLOTH ARE NOT FASTENED TO THE SAME POST.
6. BACKFILL SHALL BE PLACED AROUND THE INLET IN COMPACTED 6-INCH LAYERS UNTIL THE EARTH IS EVEN WITH NOTCH ELEVATION ON ENDS AND TOP ELEVATION ON SIDES.
7. A COMPACTED EARTH DIKE OR A CHECK DAM SHALL BE CONSTRUCTED IN THE DITCH LINE BELOW THE INLET IF THE INLET IS NOT IN A DEPRESSION AND IF RUNOFF BYPASSING THE INLET WILL NOT FLOW TO A SETTLING POND. THE TOP OF EARTH DIKES SHALL BE AT LEAST 6-INCHES HIGHER THAN THE TOP OF THE FRAME.



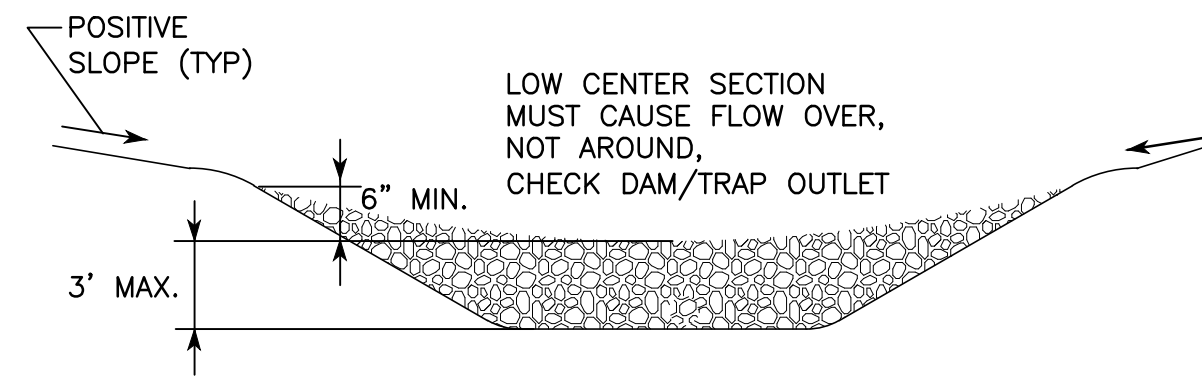
DRAIN PIPE TRENCH DETAIL
SCALE: NONE



TYPICAL FILTER FABRIC FENCE
SCALE: NONE



SEDIMENT TRAP / CHECK DAM OUTLET PROFILE
NOT TO SCALE



CROSS SECTION
NOT TO SCALE

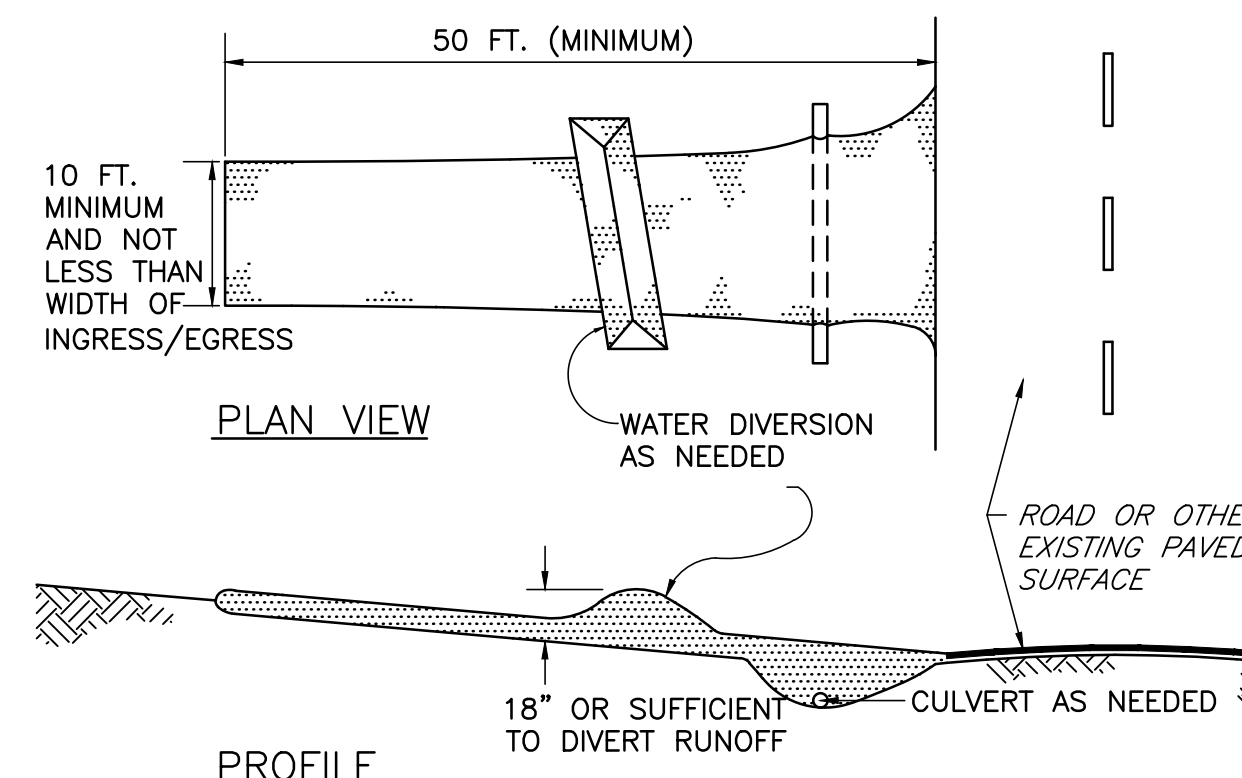
MITIGATIVE MEASURES - EROSION/SEDIMENT CONTROL

1. SITE CLEARING AND GRUBBING SHALL NOT COMMENCE UNTIL SUCH TIME THAT THE CONTRACTOR IS PREPARED TO START CONSTRUCTION. REMOVE ONLY THOSE TREES, SHRUBS, AND GRASSES THAT MUST BE REMOVED FOR CONSTRUCTION OF ACTUAL FACILITIES; PROTECT THE REST TO PRESERVE THEIR AESTHETIC, HABITAT, AND EROSION CONTROL VALUES.
2. IMMEDIATELY FOLLOWING SITE AND ACCESS CLEARING, TEMPORARY EROSION AND SEDIMENTATION CONTROLS SHALL BE INSTALLED. THEY WILL BE MAINTAINED IN EFFECTIVE OPERATING CONDITION DURING CONSTRUCTION UNTIL FINAL SEEDING AND SITE RESTORATION OCCURS.
3. AT THE WTP CONSTRUCTION SITE, INSTALL SEDIMENT BASINS AND DIVERSION DIKES BEFORE DISTURBING THE LAND THAT DRAINS INTO THEM.
4. DIVERSION CHANNELS WILL BE CONSTRUCTED AROUND THE WTP CONSTRUCTION SITE TO COLLECT RUNOFF AND PREVENT SILT AND OTHER ERODIBLE MATERIALS FROM ENTERING LOCAL DRAINAGE COURSES. DIVERSION CHANNELS WILL FLOW TO TEMPORARY SEDIMENT BASINS, AND ARE TO BE STABILIZED THROUGH SEEDING, RIP-RAPPING, OR LINING THEM WITH PLASTIC.
5. EXISTING TOPSOIL WILL BE STOCKPILED AND REPLACED UPON FINAL GRADING OF THE WTP CONSTRUCTION SITE.
6. EXTENSIVE AREAS OF STOCKPILED TOPSOIL AT THE WTP CONSTRUCTION SITE ARE TO BE PROTECTED THROUGH THE USE OF TEMPORARY SEEDING AND MULCHING OR COVERING SUCH AS WITH ANCHORED STRAW MULCH. SILT BARRIERS WILL BE INSTALLED DOWN GRADIENT OF THESE AREAS ON CONTOUR AND WITH THEIR ENDS UP SLOPE OF THE CONTOUR TO PREVENT SILT LADEN RUNOFF FROM ENTERING WATERWAYS OR STORM SEWERS. WITHIN 15 DAYS OF COMPLETION OF CONSTRUCTION, ANY REMAINING SOIL MUST EITHER BE REMOVED OR PERMANENTLY STABILIZED.
7. SILT FENCES SHOULD BE TRENCHED SIX TO TWELVE INCHES DEEP, THE FABRIC LAID IN THE TRENCH, AND THE SOIL PROPERLY BACKFILLED INTO THE TRENCH TO PREVENT UNDERCUTTING.
8. WHERE TRENCH EXCAVATION OCCURS PARALLEL TO ANY WATERWAY, A VEGETATED BARRIER SHOULD BE MAINTAINED BETWEEN THE STREAM AND THE CONSTRUCTION SITE. ALL TRENCH SPOILS WILL BE STOCKPILED ON THE SIDE OF THE TRENCH AWAY FROM THE WATERWAY, AND A LINE OF SILT BARRIERS WILL BE ESTABLISHED ALONG THE EDGE OF CONSTRUCTION ON THE CONTOUR BETWEEN THE TRENCH AND THE WATERWAY.
9. LAYING OF PIPE IN TRENCHES SHOULD OCCUR SO AS TO MINIMIZE THE AMOUNT OF DISTURBED AREA. ALL TRENCHES ARE TO BE BACKFILLED AND COMPACTED IMMEDIATELY AFTER PIPE INSTALLATION. IMMEDIATELY FOLLOWING THE BACKFILLING OF THE TRENCH, THE GROUND SURFACE WILL BE ROUGH GRADED TO THE EXISTING CONTOURS TO ALLOW FOR PROPER DRAINAGE, AND WILL BE SEEDDED AND/OR MULCHED IN STAGES TO PREVENT EROSION.
10. ANY DISTURBED AREA THAT WILL NOT BE ACTIVELY UNDER CONSTRUCTION FOR A PERIOD OF 15 DAYS OR MORE WILL BE TEMPORARILY STABILIZED IMMEDIATELY BY SEEDING AND MULCHING OR BY ANCHORED STRAW MULCH.
11. AS CONSTRUCTION IS COMPLETED, PERMANENTLY STABILIZE EACH DISTURBED AREA IN STAGES WITH PERENNIAL VEGETATION INSTALLED ACCORDING TO NATURAL RESOURCES CONSERVATION SERVICE (OR EQUIVALENT) STANDARDS AND SPECIFICATIONS. AFTER FINAL SOIL SETTLING OVER THE SANITARY SEWER, OUTFALL SEWER, AND FORCE MAIN ALIGNMENTS, THE CONTRACTOR SHALL BRING THE TRENCH BACK TO GRADE IF NECESSARY, PLACE TOPSOIL, AND FINE GRADE, SEED, FERTILIZE, AND MULCH ALL AREAS DISTURBED BY ACTIVITIES ASSOCIATED WITH THE CONSTRUCTION OF THAT SECTION OF PIPE. FINAL GRADING WILL BE CONSISTENT WITH PRE-CONSTRUCTION TOPOGRAPHY FOR DRAINAGE AND AESTHETIC REASONS.
12. SLOPES EXCEEDING 15 PERCENT OR THAT TEND TO BE UNSTABLE REQUIRE SPECIAL TREATMENT SUCH AS WATER DIVERSION BERMS, SODDING, OR THE USE OF JUTE OR EXCELSIOR BLANKETS.
13. WHEN BORROW MATERIAL IS OBTAINED FROM OTHER THAN COMMERCIAL OPERATED SOURCES, EROSION OF THE BORROW SITE WILL BE SO CONTROLLED BOTH DURING AND AFTER COMPLETION OF THE WORK THAT EROSION WILL BE MINIMIZED AND SEDIMENT WILL NOT ENTER STREAMS OR OTHER BODIES OF WATER. WASTE OR DISPOSAL AREAS AND CONSTRUCTION ROADS SHALL BE LOCATED AND CONSTRUCTED IN A MANNER THAT WILL KEEP SEDIMENT FROM ENTERING STREAMS. TEMPORARY EROSION CONTROL BARRIERS AND LIMITED SITE CLEARING WILL BE USED AS NEEDED.
14. IF WORK IS SUSPENDED FOR ANY REASON, THE CONTRACTOR SHALL MAINTAIN THE SOIL EROSION AND SEDIMENTATION CONTROLS IN GOOD OPERATING CONDITION DURING THE SUSPENSION OF THE WORK. ALSO, WHEN SEASONAL CONDITIONS PERMIT AND THE SUSPENSION OF WORK IS EXPECTED TO EXCEED A PERIOD OF ONE MONTH, THE CONTRACTOR SHALL SEED, FERTILIZE, AND MULCH ALL DISTURBED AREAS LEFT EXPOSED WHEN THE WORK IS STOPPED.
15. INSTALL THE ABOVE EROSION AND SEDIMENT CONTROL MEASURES, AS APPROPRIATE, REFERRING TO NATURAL RESOURCES CONSERVATION SERVICE OR EQUIVALENT STANDARDS AND SPECIFICATION FOR PARTICULAR TECHNIQUES. THESE MEASURES ARE TO BE MAINTAINED IN EFFECTIVE WORKING CONDITION DURING CONSTRUCTION AND UNTIL ALL DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.
16. ARCHAEOLOGICAL/HISTORICAL RESOURCES. CONTRACTORS AND SUBCONTRACTORS ARE REQUIRED UNDER OHIO REVISED CODE SECTION 149.53 TO NOTIFY THE OHIO HISTORICAL SOCIETY AND THE OHIO HISTORIC SITE PRESERVATION BOARD OF ARCHAEOLOGICAL DISCOVERIES LOCATED IN THE PROJECT AREA, AND TO COOPERATE WITH THOSE ENTITIES IN ARCHAEOLOGICAL AND HISTORIC SURVEYS AND SALVAGE EFFORTS IF SUCH DISCOVERIES ARE UNCOVERED WITHIN THE PROJECT AREA.

CONTACT: OHIO HISTORIC PRESERVATION OFFICE
PHONE: 1 (614) 297-2470

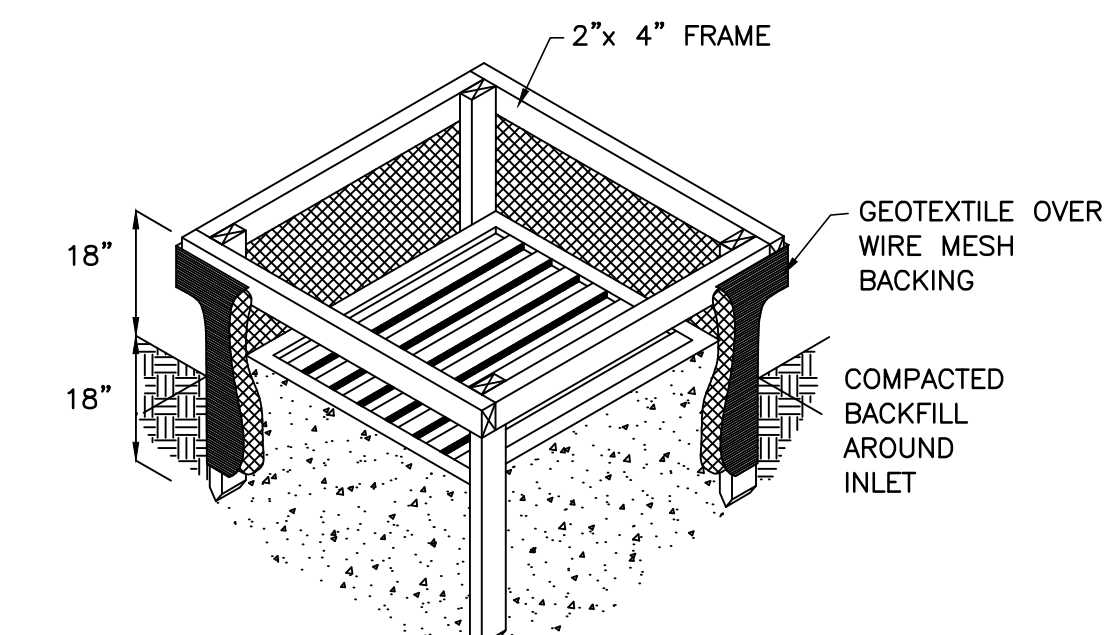
GENERAL EROSION CONTROL NOTES

1. SEDIMENT PONDS/TRAPS AND PERIMETER CONTROLS SHALL BE IMPLEMENTED AS A FIRST STEP OF GRADING AND WITHIN 7 DAYS FROM THE START OF GRUBBING AND SHALL CONTINUE TO FUNCTION UNTIL UPLAND AREAS ARE STABILIZED.
2. EROSION CONTROL BLANKETS WITH MATTING WILL BE USED ON DITCHES GREATER THAN 1.5% AND ALL OTHER SLOPES GREATER THAN 6% GRADE.
3. CONTRACTOR IS RESPONSIBLE FOR EROSION CONTROL ON INDIVIDUAL LOT. CONTRACTOR MUST FILE INDIVIDUAL NOTICE OF INTENT (NOI) WITH OHIO EPA.
4. NO SOLID OR LIQUID WASTE SHALL BE DISCHARGED INTO STORM WATER RUNOFF.
5. OFF-SITE VEHICLE TRACKING SEDIMENT SHALL BE MINIMIZED. CONSTRUCTION VEHICLES ARE LIMITED TO THE CONSTRUCTION ACCESS ROAD(S) NOTED ON THE PLAN.
6. ALL EROSION AND SEDIMENT CONTROL PRACTICES MUST MEET THE STANDARDS AND SPECIFICATIONS OF THE OHIO RAINWATER AND LAND DEVELOPMENT HANDBOOK (1996).
7. OTHER EROSION AND SEDIMENT CONTROL ITEMS MAY BE NECESSARY DUE TO ENVIRONMENTAL CONDITIONS.
8. REGULAR INSPECTION AND MAINTENANCE WILL BE PROVIDED FOR ALL EROSION AND SEDIMENT CONTROL PRACTICES. PERMANENT RECORDS OF MAINTENANCE AND INSPECTIONS MUST BE KEPT THROUGHOUT THE CONSTRUCTION PERIOD. INSPECTIONS MUST BE MADE A MINIMUM OF ONCE EVERY 7 DAYS AND IMMEDIATELY AFTER STORM EVENTS GREATER THAN 0.5 INCHES OF RAIN IN A 24-HOUR PERIOD. PROVIDE NAME OF INSPECTOR, MAJOR OBSERVATIONS, DATE OF INSPECTION AND CORRECTIVE MEASURES.
9. WINTERIZATION - ANY DISTURBED AREA THAT IS NOT GOING TO BE WORKED FOR 21 DAYS OR MORE MUST BE SEEDDED AND MULCHED BY NOVEMBER 1 OR MUST HAVE A DORMANT SEEDING OR MULCH COVER APPLIED BETWEEN NOVEMBER 1 AND MARCH 1.
10. SEEDING AND MULCHING SHALL BE PER SPECIFICATIONS.
11. ALL LABOR AND MATERIAL COSTS ASSOCIATED WITH MEETING THE EROSION CONTROL REQUIREMENTS SHALL BE INCLUDED IN THE LUMP SUM BID ITEM, UNLESS A SPECIFIC BID ITEM IS INCLUDED FOR THE EROSION CONTROL ITEM.



1. STONE SIZE -- 2-INCH STONE SHALL BE USED, RECYCLED CONCRETE WILL NOT BE PERMITTED.
2. LENGTH -- THE CONSTRUCTION ENTRANCE SHALL BE AS LONG AS REQUIRED TO STABILIZE HIGH TRAFFIC AREAS BUT NOT LESS THAN 50-FT.
3. THICKNESS -- THE STONE LAYER SHALL BE AT LEAST 6-INCHES THICK.
4. WIDTH -- THE ENTRANCE SHALL BE AT LEAST 10-FT. WIDE, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. BEDDING -- A GEOTEXTILE SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE. IT SHALL HAVE A GRAB TENSILE STRENGTH OF AT LEAST 200 LB. AND MULLEN BURST STRENGTH OF AT LEAST 190 LB.
6. CULVERT -- A PIPE OF CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE IF NEEDED TO PREVENT SURFACE WATER FLOWING ACROSS THE ENTRANCE FROM BEING DIRECTED OUT ONTO PAVED SURFACES.
7. WATER BAR -- A WATER BAR SHALL BE CONSTRUCTED AS PART OF THE CONSTRUCTION ENTRANCE IF NEEDED TO PREVENT SURFACE RUNOFF FROM FLOWING THE LENGTH OF THE CONSTRUCTION ENTRANCE AND OUT ONTO PAVED SURFACES.
8. MAINTENANCE -- TOP DRESSING OF ADDITIONAL STONE SHALL BE APPLIED AS CONDITIONS DEMAND. MUD SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADS, OR ANY SEDIMENT CONTROLS, SHALL BE REMOVED IMMEDIATELY. REMOVAL SHALL BE ACCOMPLISHED BY SCRAPING OR SWEEPING.
9. CONSTRUCTION ENTRANCES SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES AND PREVENT OFF-SITE TRACKING.

CONSTRUCTION ENTRANCE DETAIL AND NOTES
SCALE: NONE



TYPICAL STORM INLET PROTECTION WITH FILTER FABRIC
SCALE: NONE

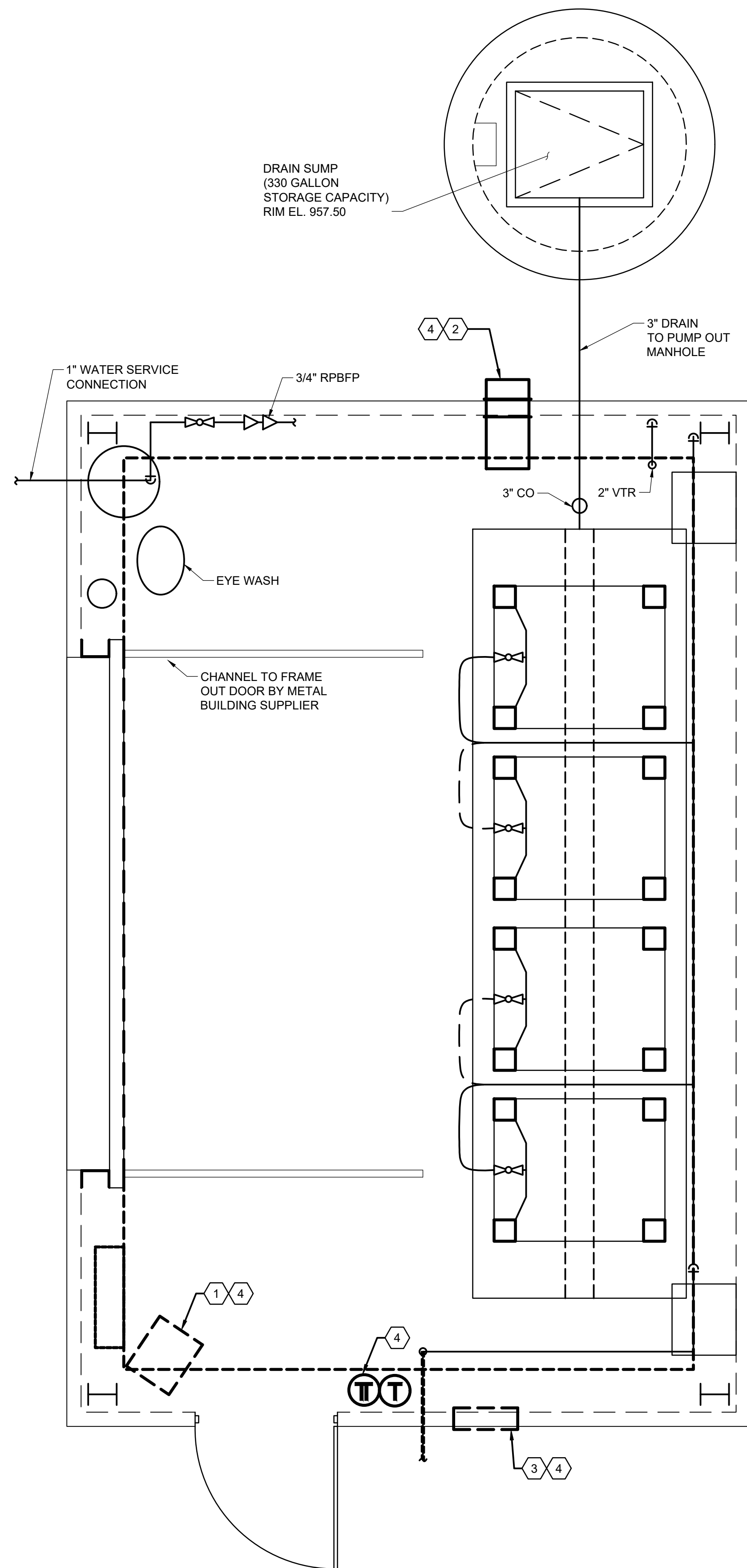
BURGESS & NIPLÉ
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PAINESVILLE, OHIO 44077

CITY OF CANTON
SUGAR CREEK
WATER TREATMENT PLANT
FILTER BACKWASH
DECHLORINATION FACILITY

REVISIONS	
NO.	DESCRIPTION

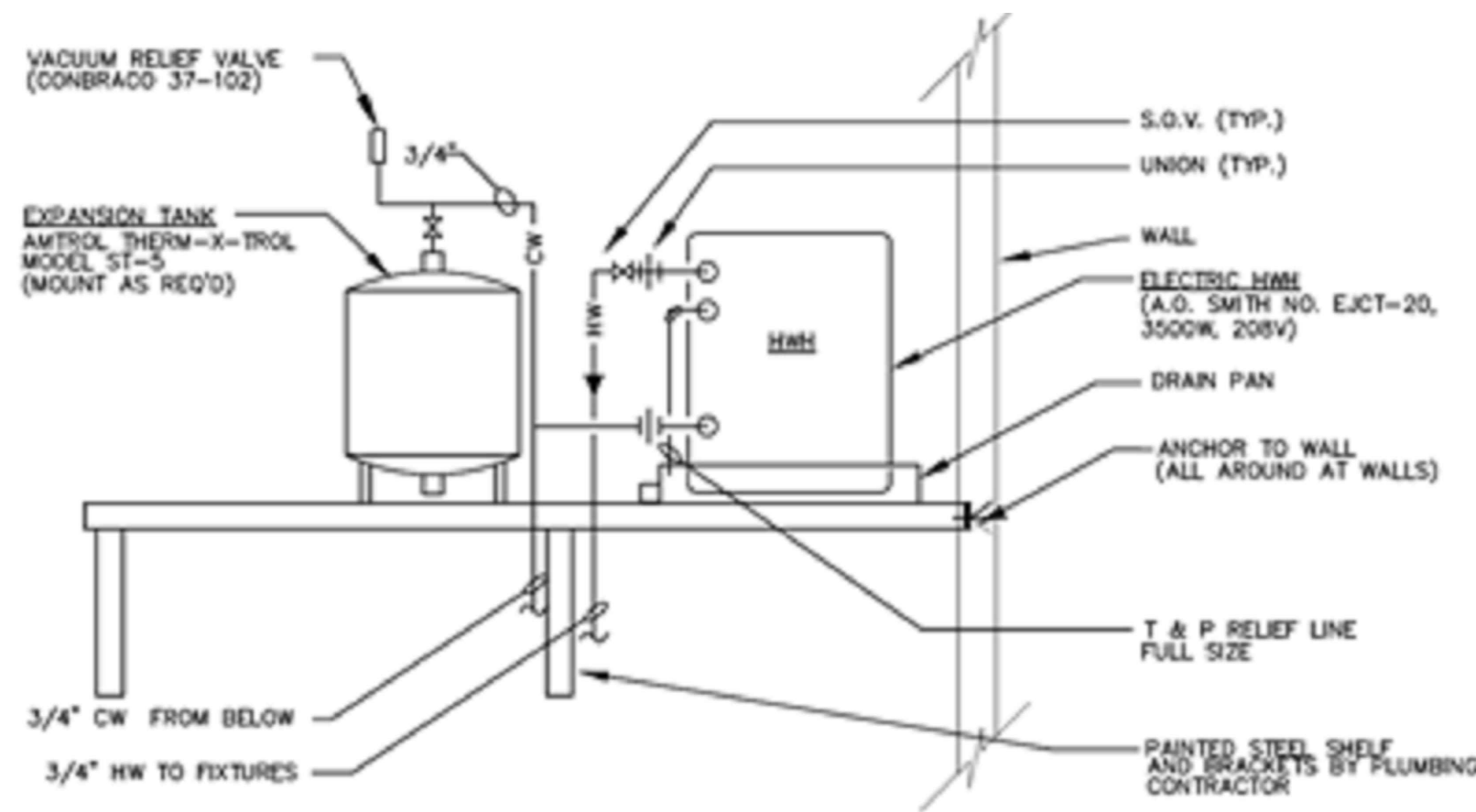
JOB NO: PR58982
DATE: JAN. 2021
DESIGNED BY: KAS
DRAWN BY: KAS
CHECKED BY: CMS
APPROVED BY: CMS
SCALE: NONE

STORMWATER POLLUTION PREVENTION DETAILS



DECHLORINATION BUILDING PLAN

SCALE: 1/2" = 1'-0"



ELECTRIC WATER HEATER PIPING AND MOUNTING DETAIL

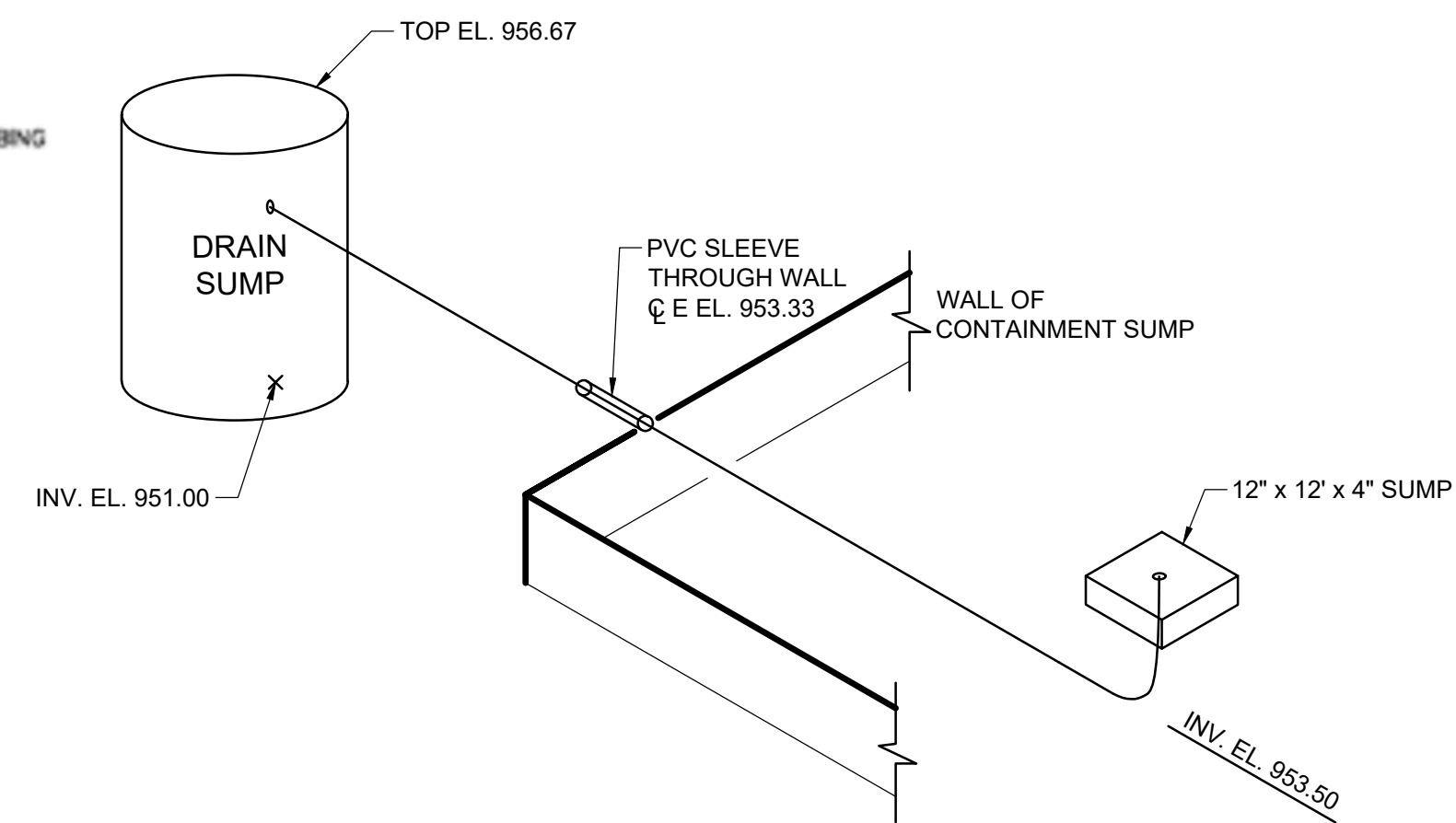
N.T.S.

CODED NOTES:

- 1 ELECTRIC UNIT HEATER EUH-1 TO BE MARKEL CATALOG NUMBER 07133002, MODEL NUMBER P3P5510T, WASHDOWN FAN FORCED TYPE, 10 KW, 480/3/60 (12.1 AMPS), WITH MOUNTING BRACKETS/HARDWARE WITH VIBRATION ISOLATORS, BUILT-IN DISCONNECT AND STAT, TOTALLY ENCLOSED FAN MOTOR, NEMA 4X NON-METALLIC CONTROL PANEL, POWER ON PILOT LIGHT, AND ALL OTHER STANDARD FEATURES. WEIGHT OF UNIT APPROXIMATELY 75 POUNDS.
- 2 EXHAUST FAN EF-1 ASSEMBLY TO BE LOREN COOK MODEL 12XW36D17(VF), DIRECT DRIVE ECM PROP TYPE, 500 CFM @ .45" SP, 120/1/60, 1/6 HP, WITH MANUAL MOTOR SPEED CONTROLLER, WALL COLLAR/SLEEVE WITH OSHA INSIDE GUARD, EXTERIOR HOOD WITH BIRESCREEN, INSULATED 120V MOTORIZED DAMPER, LOW VOLTAGE MAKE-ON-RISE WALL STAT, AND WITH EPOXY POWDER COATING. MOUNT FAN ASSEMBLY HIGH IN WALL.
- 3 18" X 18" VENTILATION SYSTEM INTAKE ASSEMBLY TO CONSIST OF A 16 GAGE GALVANIZED SHEET METAL SLEEVE, AN INSULATED AND MOTORIZED 120V DAMPER, AN OUTDOOR WEATHER HOOD WITH BIRDSCREEN, AND INSIDE BIRDSCREEN. DAMPER TO BE INTERLOCKED WITH EF-1.
- 4 ALL SYSTEM 120V AND HIGHER WIRING (POWER AND/OR INTERLOCK) BY E.C. INCLUDING ADDING A LABELED VENTILATION SYSTEM TWIST TIMER JUST INSIDE THE MAN-DOOR ENTRANCE TO BRING THE SYSTEM ON IF IT IS NOT ALREADY ON VIA THE WALL STAT. ALL LOW VOLTAGE WIRING BY M.C.

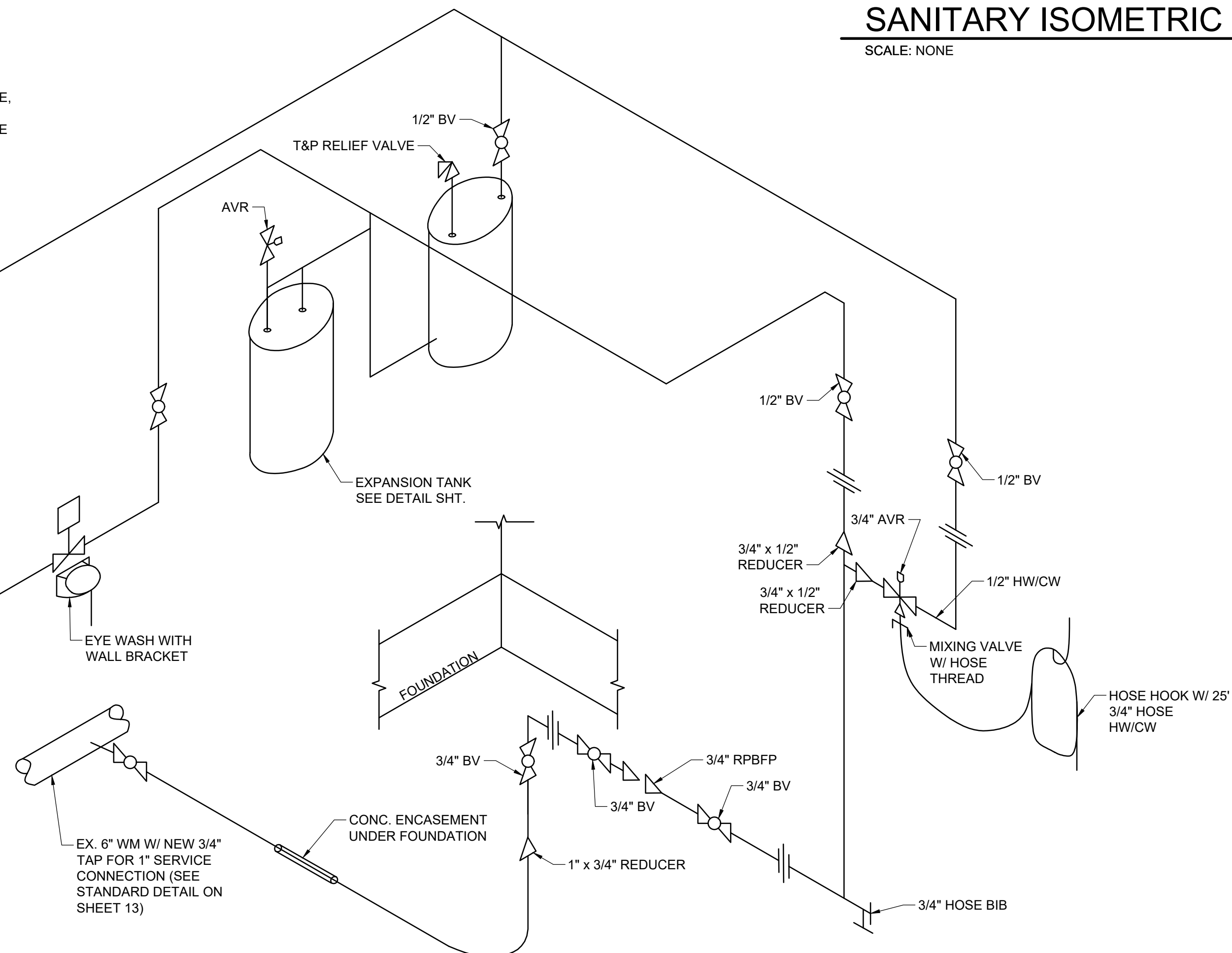
PLUMBING NOTES:

1. 1 1/2" POTABLE CW WITH WATTS 009QT BACKFLOW PREVENTER DOWN FOR WATER STORAGE TANK SYSTEM. AIR GAPPED CONNECTION TO EQUIPMENT PER MANUFACTURERS INSTALLATION DETAILS.
2. 1 1/2" POTABLE CW DOWN FOR CONNECTION TO ELECTRIC WATER HEATER (4500W/208V) WITH TEMPERING VALVE FOR CONNECTION TO EMERGENCY SHOWER/EYE WASH.
3. 1 1/2" POTABLE CW DOWN INTO TUNNEL BELOW FOR CONNECTION TO EXISTING POTABLE WATER LINE. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF EXISTING POTABLE WATER LINE.
4. 3/4" POTABLE WATER DOWN TO WALL HYDRANT AT 18" AFF.
5. 3" SANITARY DOWN FROM FLOOR DRAIN AND DISCHARGE INTO SUMP PIT BELOW.
6. 3/4" CW AND HW DOWN TO (DIXON MODEL DXWDS1 OR APPROVED EQUAL) AND CONNECT TO HOSE REEL (HANNAY REELS MODEL N818-23-24J 50' OF 3/4" HOSE)
7. 1/2" CW AND HW TO HAWS 9210EW THERMOSTATIC MIXING VALVE ANN 1/2" TEPID WATER TO HAWS 7260B-7270B WALL MOUNT EYE WASH.
8. 1 1/2" HW FOR CONNECTION TO PROCESS EQUIPMENT.
9. 1 1/2" CW AND HW LINES FROM ELECTRIC TANKLESS WATER HEATERS.
10. FURNISH AND INSTALL EXPANSION TANK AMTROL THERM-X-TROL MODEL ST-5 OR EQUAL SHALL BE PROVIDED ON COLD WATER SUPPLY LINE TO WATER HEATER (SEE DETAIL THIS SHEET).
11. FLOOR CLEANOUT SHALL BE ZURN-1400 OR EQUAL WITH ADJUSTABLE FLOOR CLEANOUT. DURA-COATED CAST IRON BODY WITH GAS TIGHT AND WATER TIGHT ABS TAPERED THREADED PLUG AND SERRATED TOP ADJUSTABLE TO FINISH FLOOR. FLOOR DRAIN SHALL BE ZURN ZN1415-P DURA-COATED CAST IRON BODY WITH BOTTOM OUTLET AND ADJUSTABLE COLLAR WITH C-TYPE STRAINER AND TRAP PRIMER CONNECTION WITH SEEPAGE SLOTS.
13. AUTOMATIC TRAP PRIMER SHALL BE PRECISION PLUMBING MODEL P-1 OR EQUAL.



SANITARY ISOMETRIC

SCALE: NONE



PLUMBING ISOMETRIC

SCALE: NONE

NO.	DESCRIPTION	DATE

JOB NO:	PR58982
DATE:	JAN. 2021
DESIGNED BY:	CMS
DRAWN BY:	GCB
CHECKED BY:	CMS
APPROVED BY:	CMS
SCALE:	NONE

MECHANICAL HVAC AND PLUMBING

POWER LEGEND

- RECEPTACLE OUTLETS - NUMERAL BY THE SIDE OF THE SYMBOL INDICATES CIRCUIT NUMBER
DUPLICATION CONVENIENCE OUTLET MOUNTED AT +18" OR AS NOTED.
DOUBLE DUPLICATION OUTLET (FOURPLEX) RECEPTACLE MOUNTED AT +18" OR AS NOTED.

RACEWAYS AND CONDUCTORS

- INDICATES HOMERUN FROM EQUIPMENT TO PANELBOARD OR AS NOTED.
CONDUIT TURNING UP
CONDUIT TURNING DOWN

LIGHTING

- LIGHTING FIXTURES - CAPITAL LETTER INDICATES THE FIXTURE TYPE AS SHOWN ON FIXTURE SCHEDULE. NUMERAL INDICATES CIRCUIT NO. AND SMALL LETTER DESIGNATES THE CONTROL SWITCH. EXACT MOUNTING PER SCHEDULE.
CEILING WALL DESCRIPTION

SWITCHED OUTLET

- SMALL LETTER BY THE SIDE OF SYMBOLS INDICATES THE PARTICULAR SWITCH.
SAMPLE:
SINGLE POLE SWITCH MOUNTED AT +48" OR AS NOTED.

ABBREVIATED LIST OF NEMA ENCLOSURE TYPES

- TYPE 1: GENERAL PURPOSE. INDOOR.
TYPE 2: DRIP-PROOF. NONCORROSIVE. INDOOR.
TYPE 3: DUST-TIGHT. RAIN-TIGHT. OUTDOOR.

PROJECT GENERAL NOTES:

- 1. ALL WORK SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE (N.E.C.) LATEST EDITION.
2. COORDINATE ALL ELECTRICAL EQUIPMENT LOCATIONS AND MECHANICAL APURTENANCES WITHIN THE EXISTING CONDITIONS TO PROVIDE ADEQUATE WORKING AND ACCESS PER N.E.C. REQUIREMENTS.

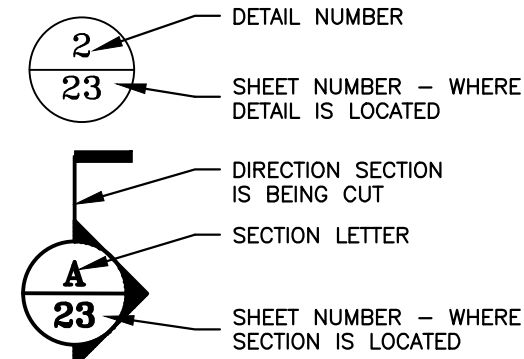
DEMOLITION GENERAL NOTES:

- 1. ANY DEMOLITION INDICATED ON THESE DRAWINGS IS SHOWN IN GENERAL TO INDICATE THE EXTENT OF DEMOLITION AND IS NOT TO BE CONSIDERED AS A RECORD DRAWING OF EXISTING CONDITIONS. ACCORDINGLY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETE DEMOLITION OF ELECTRICAL WORK INDICATED INCLUDING ANY BURIED ITEMS OR EXISTING ITEMS NOT SHOWN ON THESE DRAWINGS.

ABBREVIATIONS

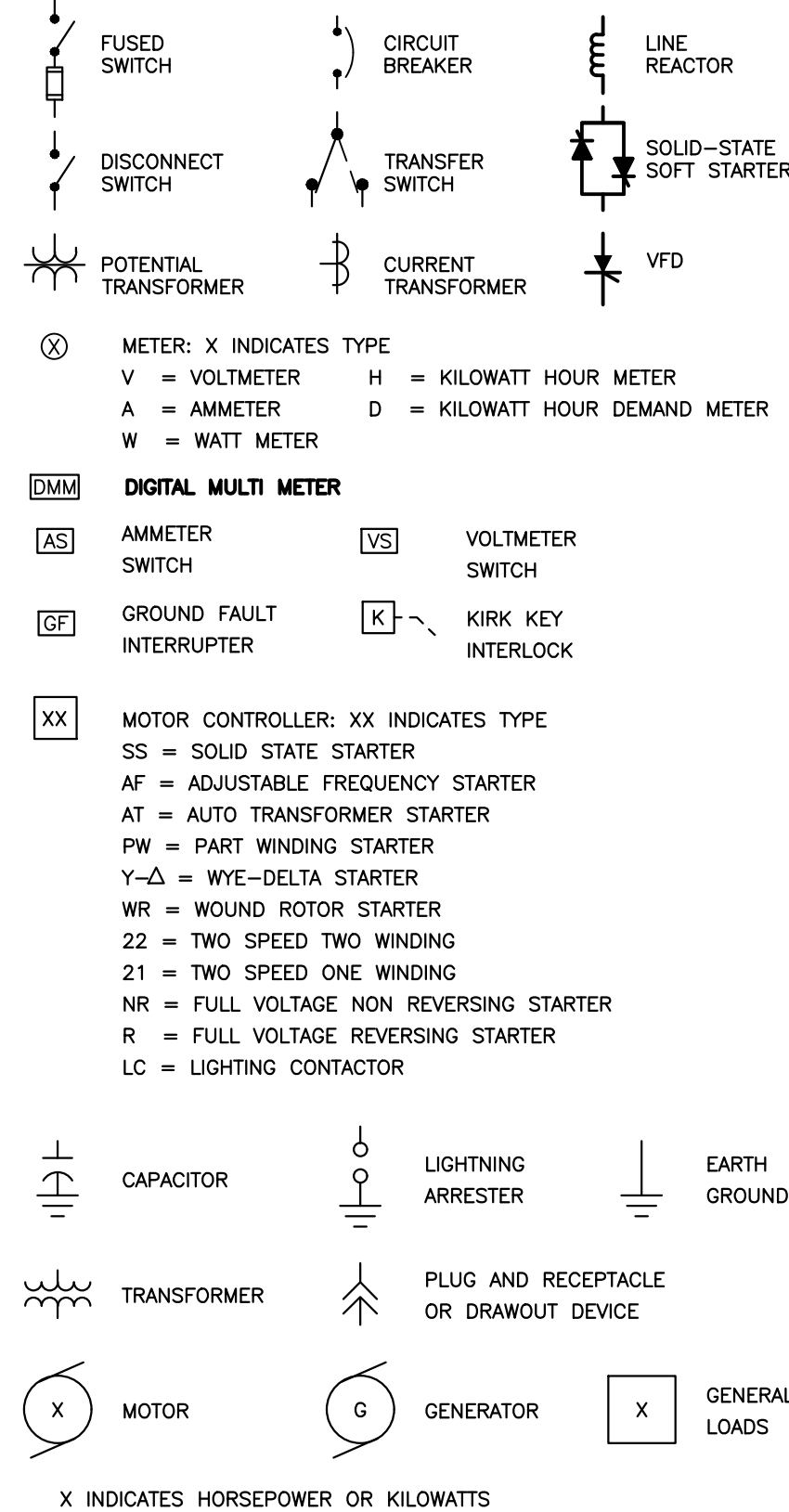
- ACB AIR CIRCUIT BREAKER
ALT ALTERNATING CURRENT
AL ALUMINUM
AWG AMERICAN WIRE GAUGE AMPERE(S)

DETAIL & SECTION MARK LEGEND

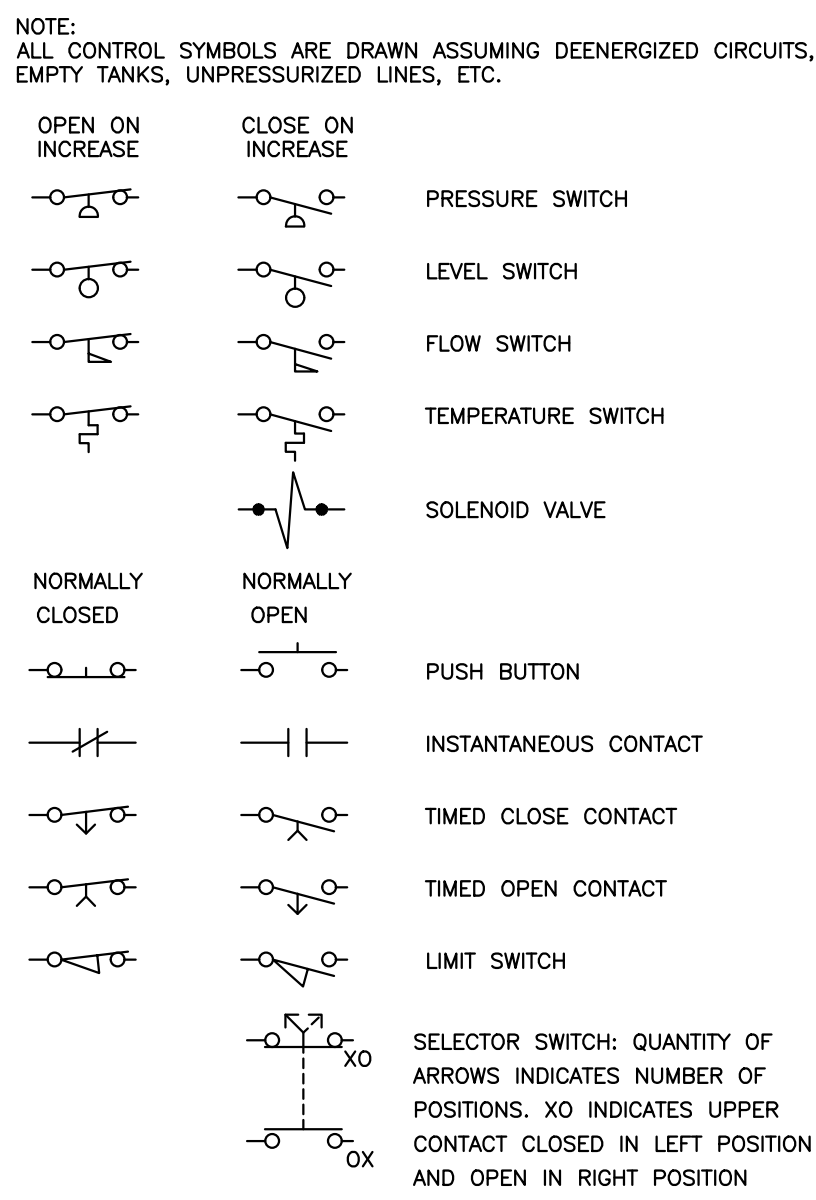


DIRECTION OF NORTH

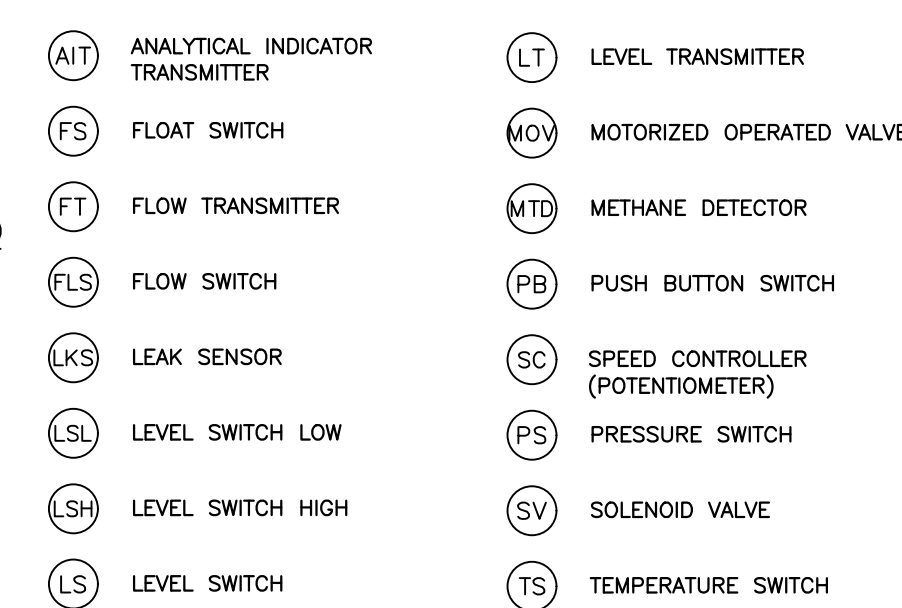
DIAGRAM SYMBOLS



CONTROL DIAGRAM SYMBOLS



INSTRUMENTATION SYMBOLS



INSTRUMENTATION NOTES:

- 1. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY POWER AND SIGNAL WIRING WITH CONDUITS AS SHOWN ON ELECTRICAL AND INSTRUMENTATION DRAWINGS BETWEEN POWER PANELS, PLC'S, CONTROL PANELS, AND FIELD INSTRUMENTS AS REQUIRED.
2. MINIMUM SIZE CONDUIT TO BE 3/4".

INSTRUMENTATION GROUNDING

- 1. SHIELDED CONDUCTORS SHALL HAVE THEIR SHIELD WIRE CONNECTED TO GROUND AT ONE END ONLY.
2. CONTROL CABINETS SHALL BE PROVIDED WITH AN ISOLATED INSTRUMENT GROUND BUS FOR INSTRUMENTATION GROUND WIRE.

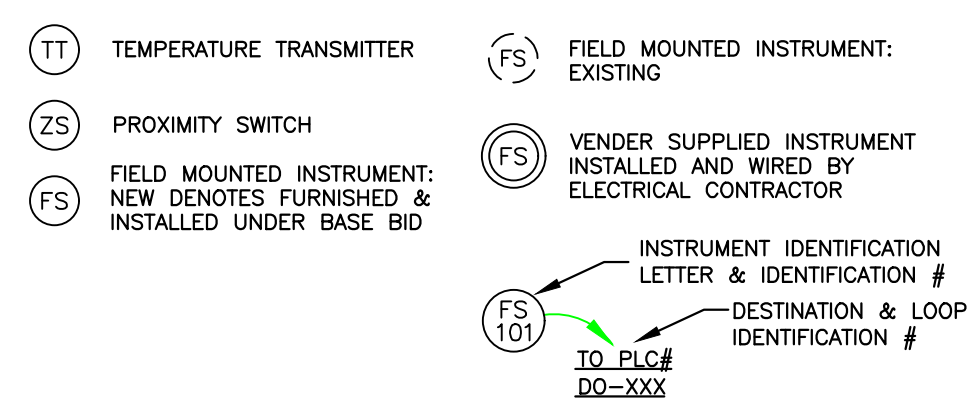
PROCESS SIGNAL SCALING & CALIBRATION

- 1. ALL INSTRUMENTS SHALL BE PROPERLY CALIBRATED BY THE INSTALLING CONTRACTOR. A CALIBRATION STICKER SHALL BE ATTACHED INDICATING CALIBRATION DATE AND THE INITIALS OF THE INDIVIDUAL WHO PERFORMED THE CALIBRATION.

INSTRUMENTATION PIPING & MOUNTING

- 1. DIRECT READING INSTRUMENTS SHALL BE MOUNTED AT EYE HEIGHT, ~5 FT ABOVE FINISHED FLOOR, UNLESS PROCESS RESTRAINTS NECESSITATE OTHER MOUNTING ARRANGEMENTS, OR UNLESS OTHERWISE NOTED.

INSTRUMENTATION SYMBOLS CONT.



Electrical, Instrumentation & Control Systems Engineering
101 Inlet Pointe
East Aurora, OH 44202
Phone: 440.726.6246

BURGESS & NIPLÉ
100 WEST ERIE STREET
PAINESVILLE, OHIO 44077

CITY OF CANTON
SUGAR CREEK
WATER TREATMENT PLANT
FILTER BACKWASH
DECHLORINATION FACILITY

Table with columns: NO., DESCRIPTION, REVISIONS, DATE

JOB NO: PR58982
DATE: JAN. 2021
DESIGNED BY: GMS
DRAWN BY: GMS
CHECKED BY: SMR
APPROVED BY: SMR
SCALE: NONE

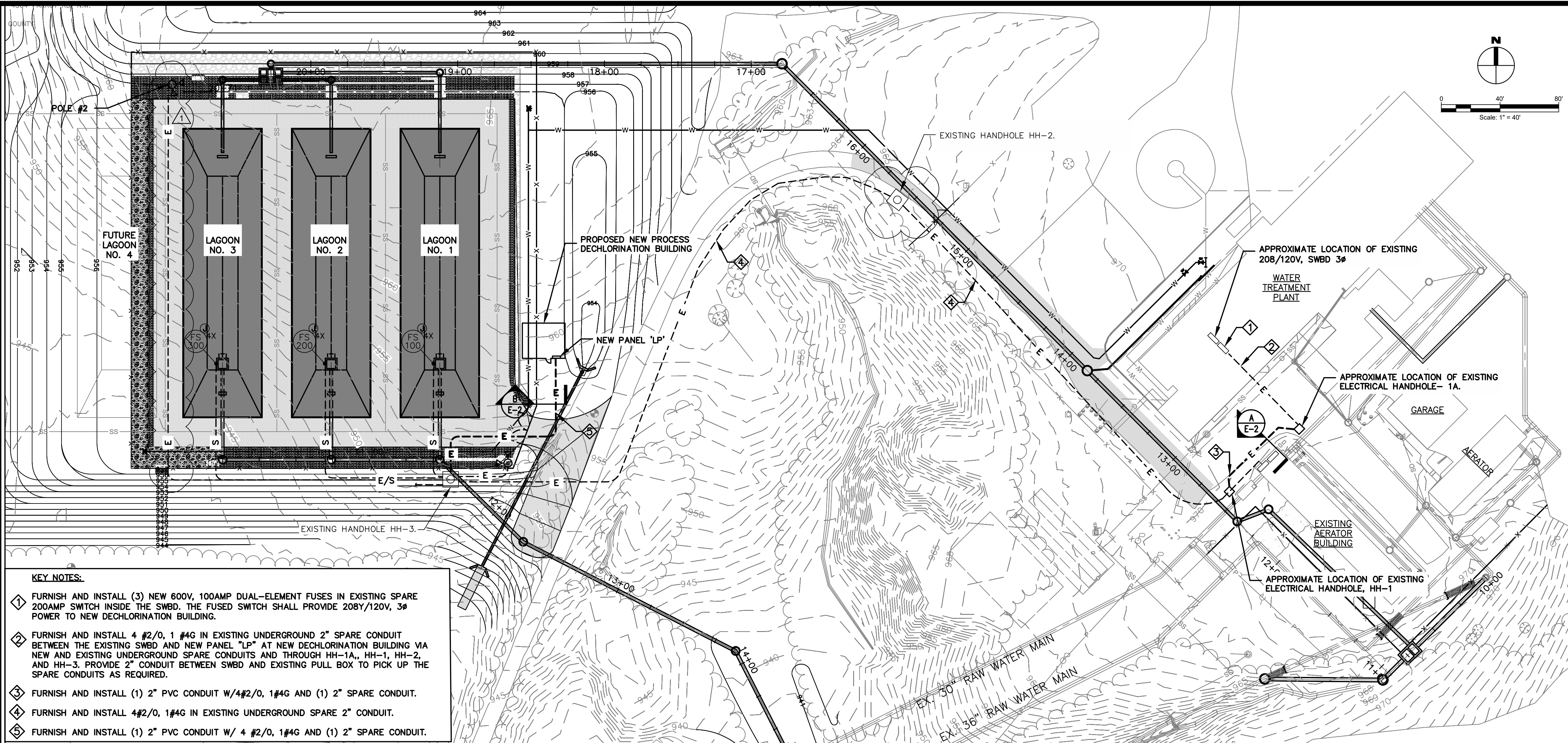
ELECTRICAL SYMBOLS AND ABBREVIATIONS

E-1
17 OF 19

ELECTRICAL FLOOR PLAN

SCALE: 3/8" = 1'-0"





- KEY NOTES:**
- 1. FURNISH AND INSTALL (3) NEW 600V, 100AMP DUAL-ELEMENT FUSES IN EXISTING SPARE 200AMP SWITCH INSIDE THE SWBD. THE FUSED SWITCH SHALL PROVIDE 208Y/120V, 3Ø POWER TO NEW DECHLORINATION BUILDING.
 - 2. FURNISH AND INSTALL 4 #2/0, 1 #4G IN EXISTING UNDERGROUND 2" SPARE CONDUIT BETWEEN THE EXISTING SWBD AND NEW PANEL "LP" AT NEW DECHLORINATION BUILDING VIA NEW AND EXISTING UNDERGROUND SPARE CONDUITS AND THROUGH HH-1A, HH-1, HH-2, AND HH-3. PROVIDE 2" CONDUIT BETWEEN SWBD AND EXISTING PULL BOX TO PICK UP THE SPARE CONDUITS AS REQUIRED.
 - 3. FURNISH AND INSTALL (1) 2" PVC CONDUIT W/4#2/0, 1#4G AND (1) 2" SPARE CONDUIT.
 - 4. FURNISH AND INSTALL 4#2/0, 1#4G IN EXISTING UNDERGROUND SPARE 2" CONDUIT.
 - 5. FURNISH AND INSTALL (1) 2" PVC CONDUIT W/ 4 #2/0, 1#4G AND (1) 2" SPARE CONDUIT.

Electrical, Instrumentation & Control Systems Engineering
SMI ENGINEERING, PC
 101 Inlet Pointe
 East Aurora, OH 44202
 Phone: 419-252-6244

THE DRAWING FOR THIS PROJECT SHALL NOT BE REPRODUCED OR ALTERED IN ANY WAY WITHOUT THE WRITTEN APPROVAL AND AUTHORITY OF SMI ENGINEERING, P.C. ANY REVISIONS SHALL BE MADE BY THE ENGINEER.

SMI ENGINEERING, PC

BURGESS & NIPLE
 50 SOUTH MAIN STREET, SUITE 600
 AKRON, OHIO 44308

CITY OF CANTON
 SUGAR CREEK
 WATER TREATMENT PLANT
 FILTER BACKWASH
 DECHLORINATION FACILITY

REVISIONS	
NO.	DESCRIPTION DATE

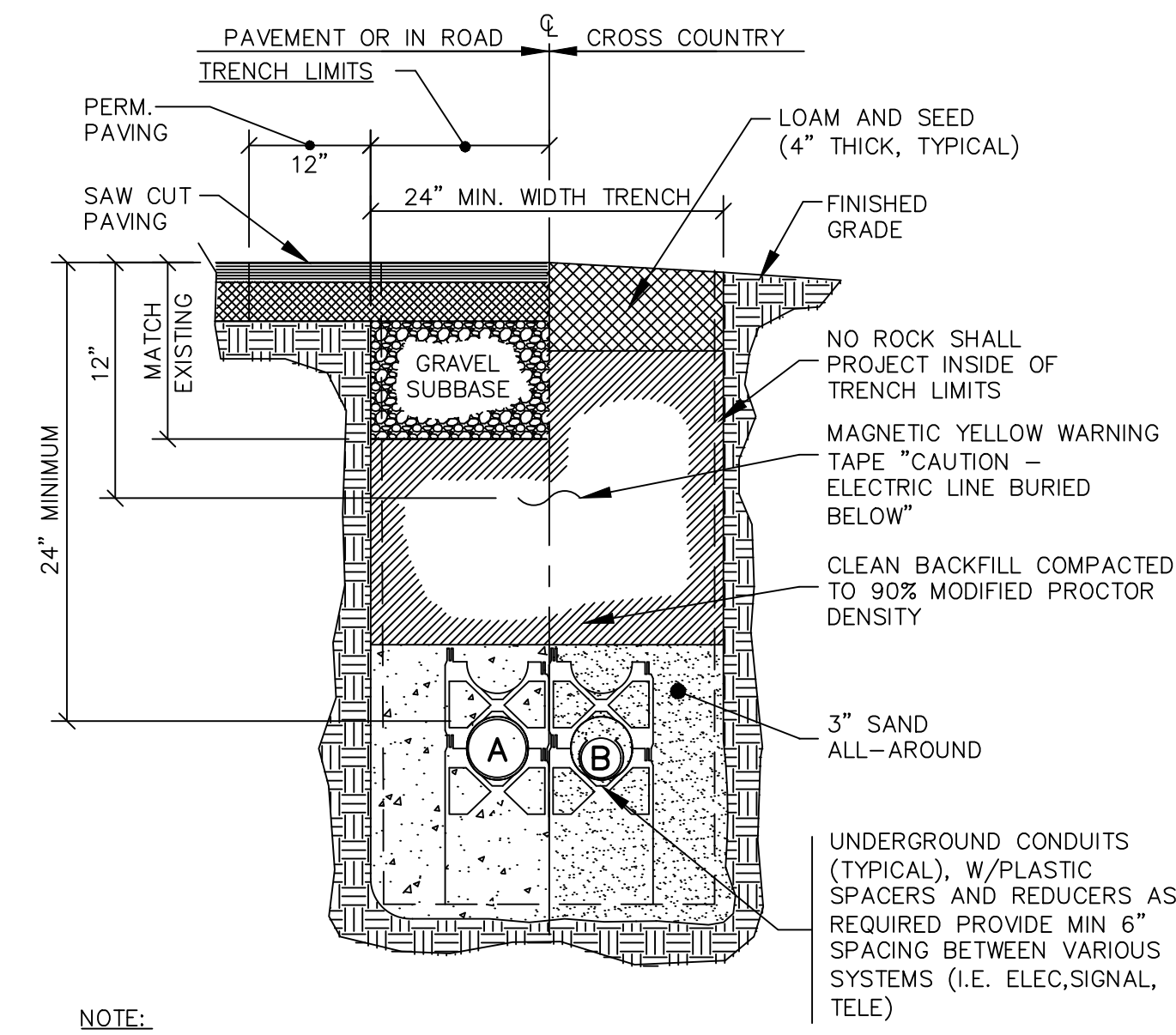
JOB NO: PR58982
 DATE: JAN. 2021
 DESIGNED BY: GMS
 DRAWN BY: GMS
 CHECKED BY: SMR
 APPROVED BY: SMR
 SCALE: NONE

ELECTRICAL SITE PLAN AND DETAILS

E-2

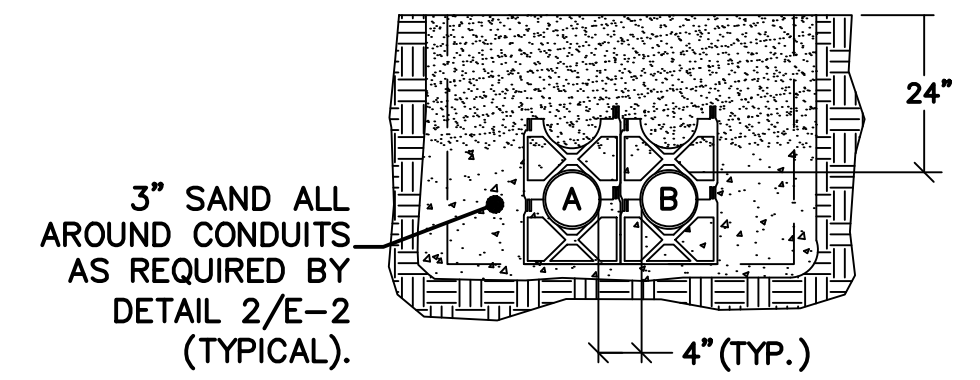
SHEET: 18 OF 19

ELECTRICAL SITE PLAN 1
 SCALE: 1"=40'-0"
 E-2



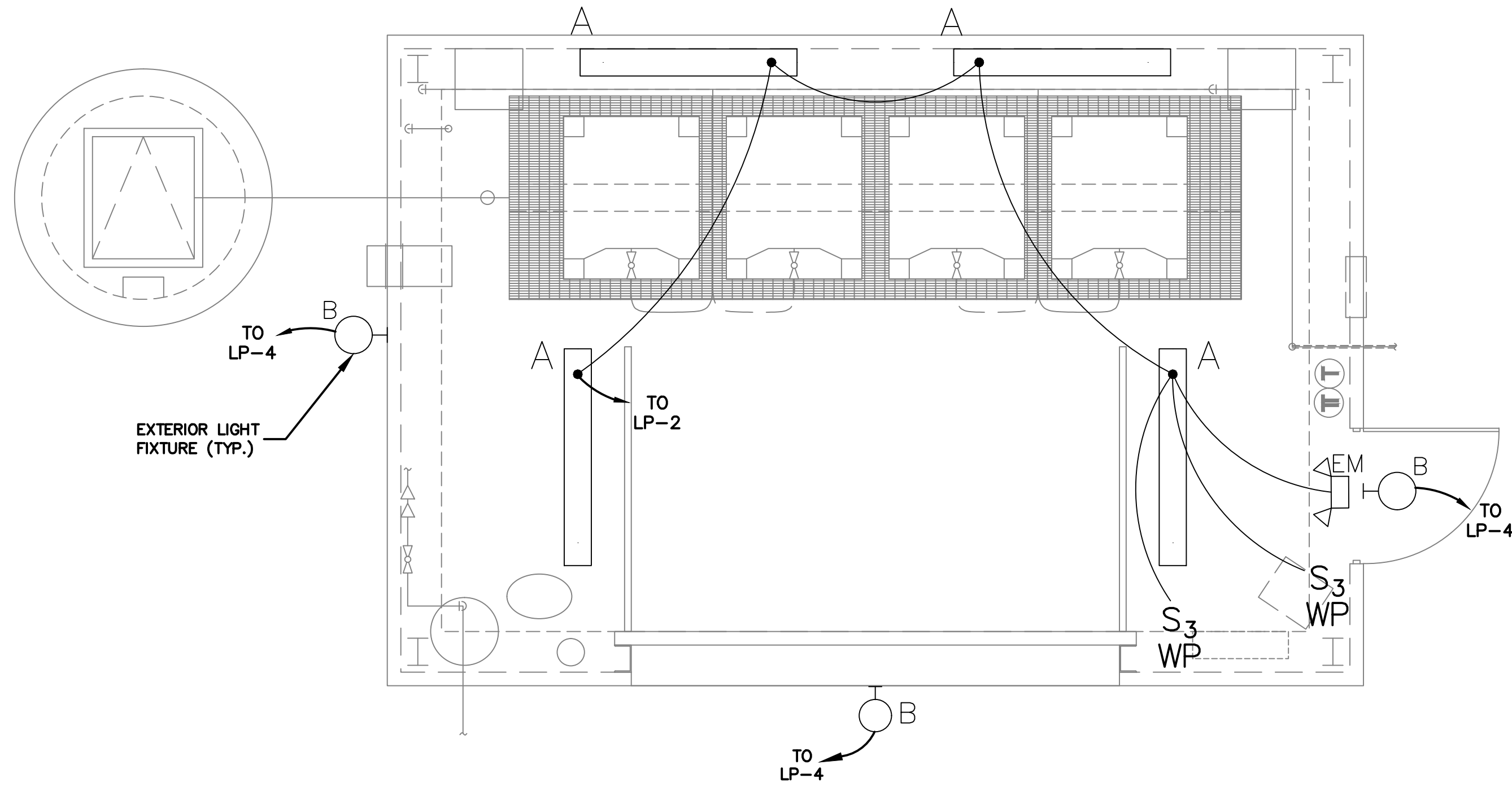
NOTE:
 REFER TO ELECTRICAL PLAN E2 FOR SPECIFIC REQUIREMENTS.

TYPICAL ELECTRICAL TRENCHING DETAIL A
 SCALE: NONE
 E-2

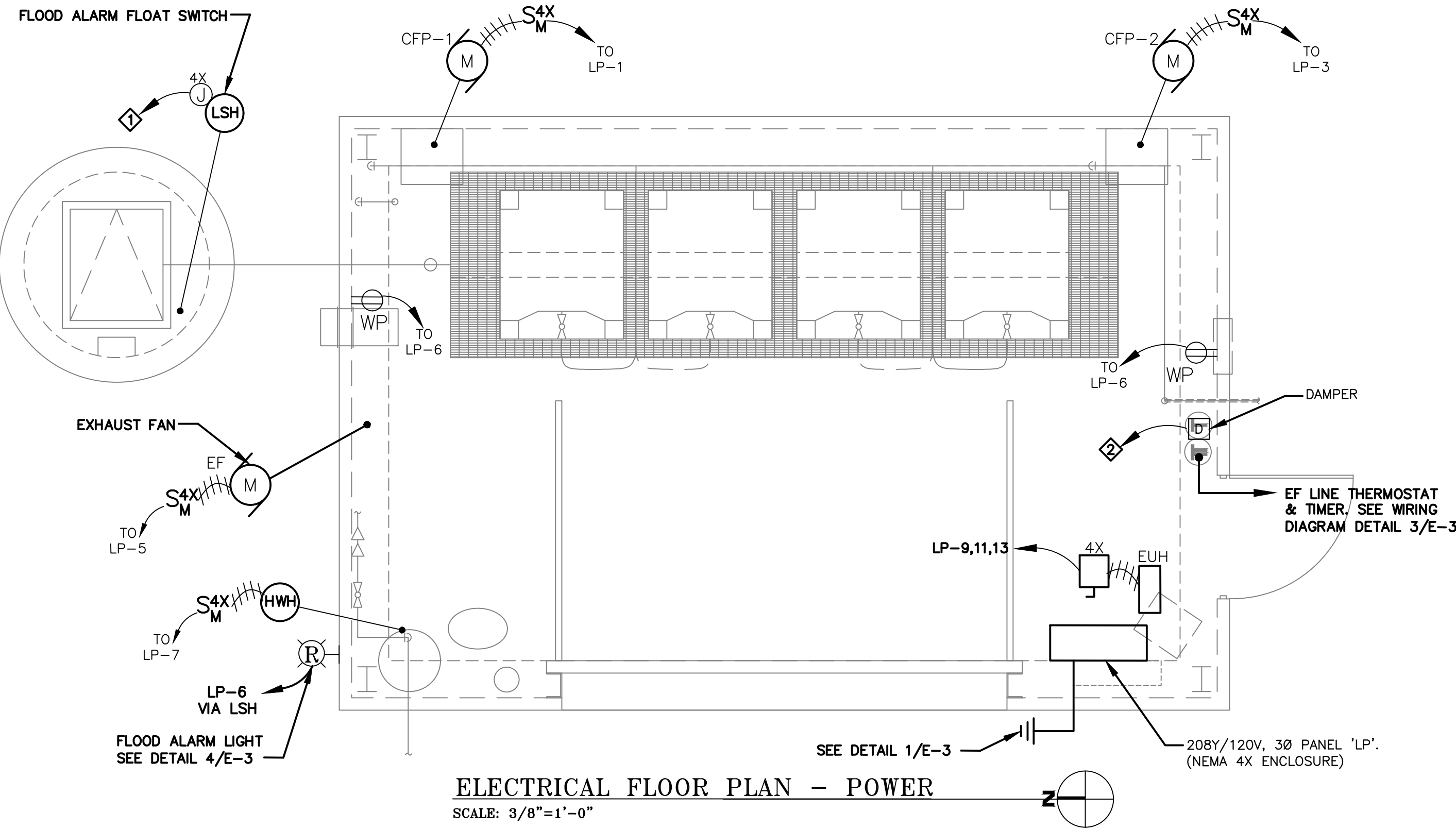


DUCT BANK SECTION B
 SCALE: NONE
 E-2

SUBSURFACE WORK NOTE:
 THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR IT'S REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT "DIG SAFE" AT 1(888)344-7233 (1(888)DIG-SAFE) AND COORDINATE ACTIVITIES PRIOR TO ANY EXCAVATIONS.



ELECTRICAL FLOOR PLAN - LIGHTING
SCALE: 3/8"=1'-0"

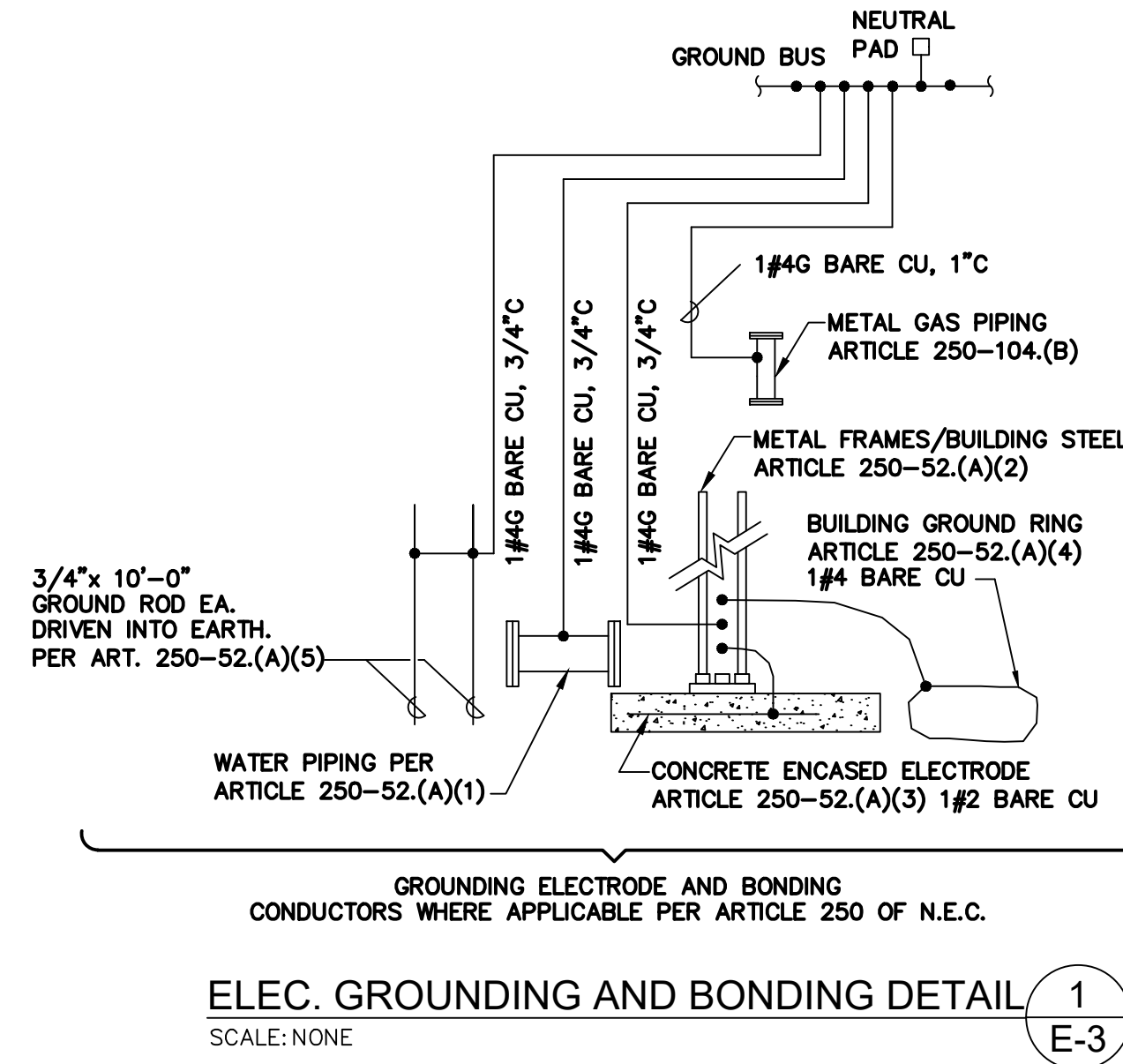


ELECTRICAL FLOOR PLAN - POWER
SCALE: 3/8"=1'-0"

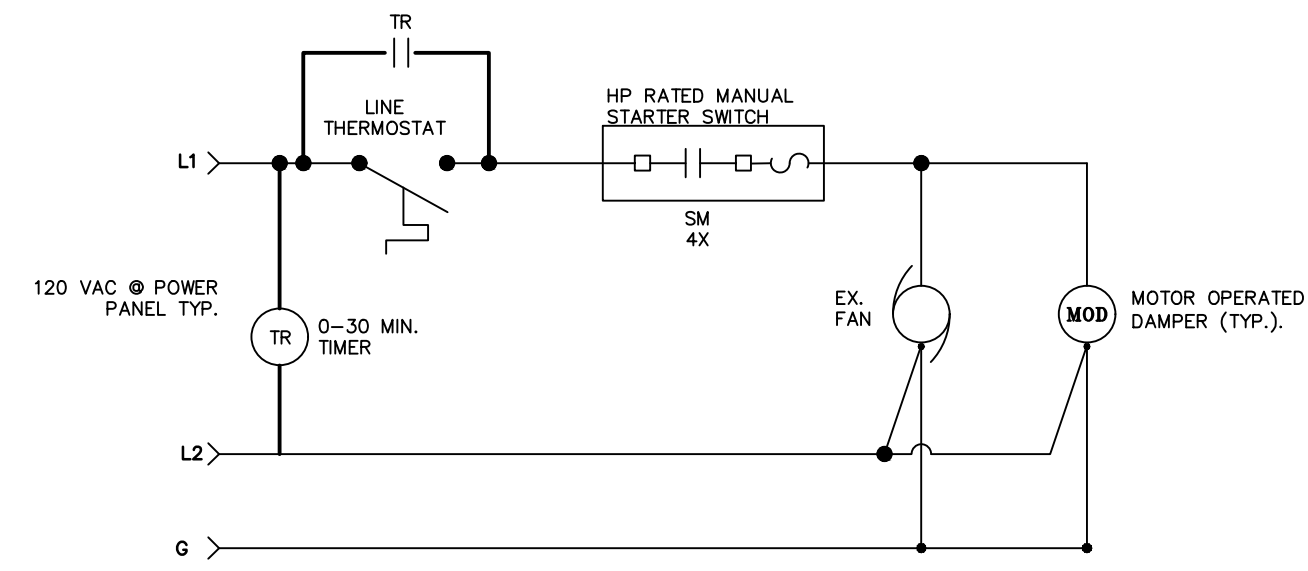
PROJECT LIGHTING FIXTURE SCHEDULE								
TYPE	MANUFACTURER	MODEL NO.	COLOR	LAMPS	MOUNTING	TYPE	VOLTAGE	REMARKS
A	HUBBELL	LXEM-440-VL-RFA-E-U-SSL OR APPROVED EQUAL	WHITE	LED	PENDANT	LED	120V	(1) 4' FIXTURE (CORROSIVE AND WET LOCATIONS) COORDINATE WITH MECHANICAL, PROCESS, EQ.
B	SPAULDING	LMC-30LU-4K-3-2-PC4 OR APPROVED EQUAL	-	LED	SURFACE	LED	120V	PROVIDE WITH PHOTO CELL, & MOTION SENSOR. MOUNT SURFACE ON WALL 12" ABOVE DOOR A.F.G.
EM	CARPENTER	NX12-36-E-N1 OR APPROVED EQUAL	GRAY	LED	WALL AT 8'-0"	EMERGENCY	120V	MOUNT SURFACE ON WALL ON SIDE OF DOOR AT 8' A.F.F. PROVIDE AN ADDITIONAL REMOTE HEAD.

PROJECT LIGHTING FIXTURE SCHEDULE
SCALE: NONE

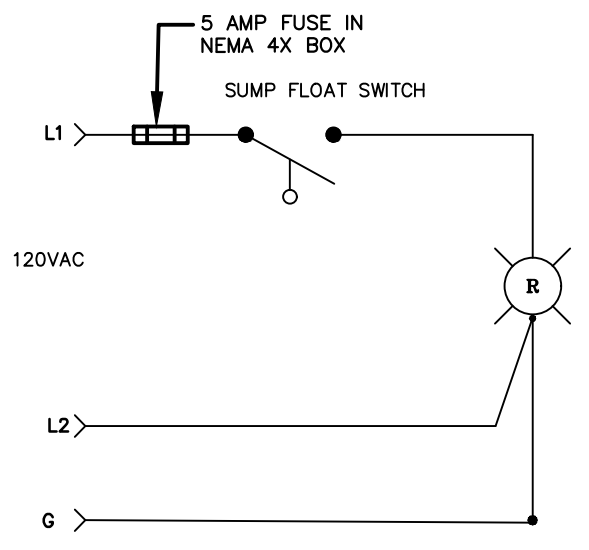
- KEY NOTES:**
- 2#14, 3/4" TO FUSE BOX. SEE FLOUT SW WIRING DIAGRAM DETAIL 4/E-3.
 - 2#12, 1#12G, 3/4" TO EF. SEE WIRING DIAGRAM DETAIL 3/E-3.
 - ALL WIRING IN DECHLORINATION BUILDING SHALL BE WITHIN PVC RACEWAY SYSTEM. ALL ELECTRICAL ENCLOSURES, PULL BOXES, J-BOXES, ETC. SHALL BE NEMA 4X, NON-METALLIC CONSTRUCTION.



ELEC. GROUNDING AND BONDING DETAIL
SCALE: NONE



SINGLE PHASE EXHAUST WIRING DIAGRAM (TYP)
SCALE: NONE



FLOOD ALARM WIRING DIAGRAM
SCALE: NONE

PANEL No. LP												LOCATION							
BUS												MOUNTING							
PANEL RATING												DRAWING No.							
SUPPLY VOLTAGE												DECHLORINATION BLDG							
SERVICE																			
100A																			
10 KAIC																			
208V																			
208Y/120V, 3Ø, 4-W W/ GND BUS																			
WIRING		DESCRIPTION		VA OR W		BREAKER		BUS		BREAKER		VA OR W		DESCRIPTION		WIRING			
# OF WIRES	CONDUIT	#A	#B	#C	POLE	AMPS	NO	A	B	C	NO	POLE	AMPS	#A	#B	#C	CONDUIT	# OF WIRES	
2#12, 1#12G	3/4"	CFP-1			1	20	1	X			2	1	20				3/4"	2#12, 1#12G	
2#12, 1#12G	3/4"	CFP-2			1	20	3	X			4	1	20				3/4"	2#12, 1#12G	
2#12, 1#12G	3/4"	EF			1	20	5	X			6	1	20				3/4"	2#12, 1#12G	
2#12, 1#12G	3/4"	EF			1	20	7	X			8	2	20				3/4"	2#12, 1#12G	
3#5, 1#10G	1"	EUH			3	40	9	X			10								
							11	X			12	1	20					SPARE	
							13	X			14	1	20					SPARE	
							15	X			16	2	30					SPARE	
							2	15			17	X	18					SPARE	
											19	X	20	2	20			SPARE	
TOTAL 1												TOTAL 2							
TOTAL 2																			
TOTAL 1 + 2																			
TOTAL CONNECTED LOAD																			
AMPERES																			
												MAIN BREAKER		100A/3P		MAIN LUGS		4X-NON METALLIC	
												FEEDER ENTRANCE				ACCESSORIES			
												FEEDER SIZE		4#2/0, 1#4G, 2"C					
												SOURCE		EXISTING SWBD					
												PANEL TYPE		BOLT-ON					

ELECTRICAL PANEL SCHEDULE
SCALE: NONE

Electrical, Instrumentation & Control Systems Engineering
SME ENGINEERING, PC
 101 Inlet Pointe
 East Aurora, OH 44202
 Phone: 440-725-6264

THE DRAWINGS FOR THIS PROJECT SHALL NOT BE REUSED OR ALTERED IN ANY WAY WITHOUT THE WRITTEN APPROVAL AND AUTHORITY OF SME ENGINEERING, PC. ANY REVISIONS SHALL BE MADE BY THE ENGINEER.

BURGESS & NIPLÉ
 100 WEST ERIE STREET
 PAINESVILLE, OHIO 44077

CITY OF CANTON
 SUGAR CREEK
 WATER TREATMENT PLANT
 FILTER BACKWASH
 DECHLORINATION FACILITY

NO.	DESCRIPTION	DATE

JOB NO: PR58982
 DATE: JAN. 2021
 DESIGNED BY: GMS
 DRAWN BY: GMS
 CHECKED BY: SMR
 APPROVED BY: SMR
 SCALE: NONE

ELECTRICAL POWER & LIGHTING PLANS, WIRING DIAGRAMS, AND SCHEDULES

Appendix D

Title VI Requirements

The City of Canton, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat.252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

No person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity, for which the Recipient receives Federal financial assistance from DOT, including the City of Canton.

Please also review Appendix A, Appendix C, Appendix D and Appendix E of the Standard Assurances which are included in the following pages.

APPENDIX A

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, *The City of Canton*, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21. *{Include City of Canton specific program requirements.}*
3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin. *{Include City of Canton specific program requirements.}*
4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or *The City of Canton* to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the Recipient or *The City of Canton*, as appropriate, and will set forth what efforts it has made to obtain the information.
5. **Sanctions for Noncompliance:** In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or *The City of Canton* may determine to be appropriate, including, but not limited to:
 - a. withholding payments to the contractor under the contract until the contractor complies; and/or
 - b. cancelling, terminating, or suspending a contract, in whole or in part.
6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as the Recipient or *The City of Canton* may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

APPENDIX C

CLAUSES FOR TRANSFER OF REAL PROPERTY ACQUIRED OR IMPROVED UNDER THE ACTIVITY, FACILITY, OR PROGRAM

The following clauses will be included in deeds, licenses, leases, permits, or similar instruments entered into by the (Title of Recipient) pursuant to the provisions of Assurance 7(a):

- A. The (grantee, lessee, permittee, etc. as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree [in the case of deeds and leases add "as a covenant running with the land"] that:
 1. In the event facilities are constructed, maintained, or otherwise operated on the property described in this (deed, license, lease, permit, etc.) for a purpose for which a U.S. Department of Transportation activity, facility, or program is extended or for another purpose involving the provision of similar services or benefits, the (grantee, licensee, lessee, permittee, etc.) will maintain and operate such facilities and services in compliance with all requirements imposed by the Acts and Regulations (as may be amended) such that no person on the grounds of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities.
- B. With respect to licenses, leases, permits, etc., in the event of breach of any of the above Non-discrimination covenants, (Title of Recipient) will have the right to terminate the (lease, license, permit, etc.) and to enter, re-enter, and repossess said lands and facilities thereon, and hold the same as if the (lease, license, permit, etc.) had never been made or issued.*
- C. With respect to a deed, in the event of breach of any of the above Non-discrimination covenants, the (Title of Recipient) will have the right to enter or re-enter the lands and facilities thereon, and the above described lands and facilities will there upon revert to and vest in and become the absolute property of the (Title of Recipient) and its assigns.*

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

APPENDIX D

CLAUSES FOR CONSTRUCTION/USE/ACCESS TO REAL PROPERTY ACQUIRED UNDER THE ACTIVITY, FACILITY OR PROGRAM

The following clauses will be included in deeds, licenses, permits, or similar instruments/agreements entered into by (Title of Recipient) pursuant to the provisions of Assurance 7(b):

- A. The (grantee, licensee, permittee, etc., as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree (in the case of deeds and leases add, "as a covenant running with the land") that (1) no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities, (2) that in the construction of any improvements on, over, or under such land, and the furnishing of services thereon, no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or otherwise be subjected to discrimination, (3) that the (grantee, licensee, lessee, permittee, etc.) will use the premises in compliance with all other requirements imposed by or pursuant to the Acts and Regulations, as amended, set forth in this Assurance.
- B. With respect to (licenses, leases, permits, etc.), in the event of breach of any of the above Non-discrimination covenants, (Title of Recipient) will have the right to terminate the (license, permit, etc., as appropriate) and to enter or re-enter and repossess said land and the facilities thereon, and hold the same as if said (license, permit, etc., as appropriate) had never been made or issued.*
- C. With respect to deeds, in the event of breach of any of the above Non-discrimination covenants, (Title of Recipient) will there upon revert to and vest in and become the absolute property of (Title of Recipient) and its assigns.*

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

APPENDIX E

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

Pertinent Non-Discrimination Authorities:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21.
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 *et seq.*), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. §794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 - 12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;
- The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 *et seq.*).

CANTON TITLE VI COMPLAINT PROCEDURE

I. FILING A COMPLAINT

Complaint Procedure - Any person who believes that he or she as a member of a protected class, has been discriminated against based on race, color, national origin, gender, age, disability, religion, low income status, or Limited English Proficiency (LEP) in violation of Title VI of the Civil Rights Act of 1964, as amended and its related statutes, regulations and directives, Section 504 of the Vocational Rehabilitation Act of 1973, Americans with Disabilities Act of 1990, as amended, the Civil Rights Restoration Act of 1987, as amended, and any other Federal nondiscrimination statute may submit a complaint. A complaint may also be submitted by a representative on behalf of such a person.

It is the policy of the City to conduct a prompt and impartial investigation of all allegations of discrimination and to take prompt effective corrective action when a claim of discrimination is substantiated.

No one may intimidate, threaten, coerce or engage in other discriminatory conduct against anyone because they have taken action or participated in an action to secure rights protected by the civil rights laws. Any individual alleging such harassment or intimidation may submit a complaint by following the procedure printed below.

Any individual who feels that he or she has been discriminated against may submit a written or verbal complaint to the designated Title VI Coordinator. A complaint must include the name, address and telephone number of the individual making the complaint (complainant) and a brief description of the alleged discriminatory conduct including the date of harm. An individual submitting a complaint alleging discrimination may include any relevant evidence, including the names of witnesses and supporting documentation.

Complaints should be directed to the Title VI Coordinator:

Fonda Williams
Deputy Mayor
218 Cleveland Ave S.W., 8th floor
Canton, Ohio 44702
Phone - 330-438-4302
Email – fonda.williams@cantonohio.gov

Within 60 days of the receipt of the complaint the City will conduct an investigation of the allegation based on the information provided and issue a written report of its findings to the complainant. The City will try to obtain an informal voluntary resolution to all complaints at the lowest level possible.

A complainant's identity shall be kept confidential except to the extent necessary to conduct an investigation. All complaints shall be kept confidential.

These procedures do not deny the right of any individual to file a formal complaint with any government agency or affect an individual's right to seek private counsel for any complaint alleging discrimination.

Complaints may also be filed with the following government agencies:

Ohio Department of Transportation
Office of Equal Opportunity
1980 West Broad Street
MS: 3270
Columbus, OH 43223

The U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Ohio Civil Rights Commission
Central Office
Rhodes State Office Tower
30 East Broad Street, 5th floor
Columbus, OH 43215
614-466-2785

Ohio Civil Rights Commission
Akron Regional Office
Bradley S. S. Dunn, Regional Director
Akron Government Bldg.
161 S. High Street, Suite 205
Akron, OH 44308
(330) 643-3100

Link to filing a complaint online with the Ohio Civil Rights Commission:

<https://crc.ohio.gov/FilingaCharge/ChargeFilingProcedure.aspx>

II COMPLAINT PROCESSING

The Title VI Coordinator will review the complaint upon receipt to ensure that all required information is provided, the complaint meets the filing deadline date which is 180 days from the date the alleged discriminatory act occurred, and falls within the jurisdiction of the City.

The Title VI Coordinator will then investigate the complaint. If the complaint is against the City then the Mayor's office or their designee will investigate the complaint. Additionally, a copy of the complaint will be forwarded to the City Law Director.

If the complaint warrants a full investigation, the Complainant will be notified in writing by certified mail. This notice will name the investigator and/or investigating agency.

The party alleged to have acted in a discriminatory manner will also be notified by certified mail as of the complaint. This letter will also include the investigator's name and will request that this party be available for an interview.

Any comments or recommendations from legal counsel will be reviewed by the Title VI Coordinator, Director of Public Service and Mayor's office.

Once the City has investigated the report findings, the City will adopt a final resolution. All parties associated with the complaint will be properly notified of the outcome of the City's investigative report.

If the complainant is not satisfied with the results of the investigation of the alleged discriminatory practice(s), she/he shall be advised of their right to appeal the City's decision.

Appeals must be filed within 180 days after the City's final resolution. Unless new facts not previously considered come to light, reconsideration of the City's determination will not be available.

The foregoing complaint resolution procedure will be implemented in accordance with the Department of Justice guidance manual entitled "Investigation Procedures Manual for the Investigation and Resolution of Complaints Alleging Violations of Title VI and Other Nondiscrimination Statutes," available online at:

<http://www.justice.gov/crt/about/cor/Pubs/manuals/complain.pdf>

Title VI Complaint Filing

Complaints filed with the City of Canton, Ohio based on violations of Title VI of the Civil Rights Act of 1964, must include the following information:

- Name of Complainant
- Date of Complaint
- Address of Complainant
- Telephone Number of Complainant
- Name of Agency / Department Accused of Discriminatory Practices
- Name of Individual Accused of Discriminatory Practices
- Address of Agency
- Date of Alleged Discrimination
- Description of Alleged Discrimination (see below)

11. Alleged Discrimination - If your complaint is in regard to discrimination in the delivery of services or discrimination that involved the treatment of you by others by the agency or department indicated above, please indicate below the basis on which you believe these discriminatory actions were taken.

- Race / Color / Religion
- National Origin
- Age · Sex, Gender
- Disability · Income Status
- Explanation of Alleged Discrimination - Please explain as clearly as possible what happened.

Provide the name(s) of witness(s) and others involved in the alleged discrimination. (Attach additional sheets if necessary and provide a copy of written material pertaining to your case.)

- Signature of Complainant · Date of Complaint

III ENVIRONMENTAL JUSTICE

In accordance with Title VI of the Civil Rights Act of 1964, each Federal agency shall ensure that all programs or activities receiving Federal financial assistance that affect human health or the environment do not directly, or through other arrangements, use criteria, methods, or practices that discriminate on the basis of race, color, or national origin. Part of Title VI reads, "No person in the United States shall, on the ground of race, color, or national origin be excluded

from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving Federal financial assistance.”

The three fundamental environmental justice (EJ) principles are:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations;
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process; and
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority populations and low-income populations.

The City of Canton is committed to these three environmental justice principles in all work that the City performs.

IV. ADMINISTRATION – WORK PLAN

Pursuant to 23 CFR 200, the City of Canton has designated a Title VI Coordinator who is responsible for initiating, monitoring, and ensuring the City’s compliance with Title VI requirements for the following work plan:

- Administer, coordinate and Implement the Title VI Program plan and distribute internally and externally via website and update annually as required.
- Ensure that Assurances are being used in contracts for federal projects.
- Attend Title VI training.
- Collect public involvement data.
- Review written Title VI complaints and ensure every effort is made to resolve complaints informally at the local or regional level and review and update the City’s Title VI plan and procedures as required.
- Implement a plan that provides training to City Staff on the basic requirements of the Title VI implementation plan.

Title VI Coordinator:

Fonda Williams
Deputy Mayor
218 Cleveland Avenue, S.W., 8th floor
Canton, Ohio 44702
Phone – 330-438-4302
Email - fonda.williams@cantonohio.gov

V. LIMITED ENGLISH PROFICIENCY (LEP) POLICY

On August 11, 2000, the President signed an executive order, *Executive Order 13166: Improving Access to Service for Persons with Limited English Proficiency (LEP)*, to clarify Title VI of the Civil Rights Act of 1964. It has as its purpose, to ensure meaningful access to programs and services to otherwise eligible persons who are not proficient in the English language. In addition, The US Department of Transportation published *Policy Guidance Concerning Recipients' responsibilities to Limited English Proficient Person* in the December 14, 2005 Federal Register.

This guidance outlines the following four factors that the City uses to access the LEP populations in Canton.

1. The number and proportion of LEP persons eligible to be served or likely to be encountered by the City.
2. The frequency with which LEP individuals come into contact with the program, activity or service.
3. The nature and importance of the program, activity, or service provided by the program.
4. The resources available to the City and costs.

Summary of the four factor analysis

Factor 1- The number and proportion of LEP persons eligible to be served or likely to be encountered by the City can only be estimated until the actual number of persons who can speak English less than “very well” are documented as needing assistance by City Staff . With this Title VI Plan being in early development stages and considered a document that may need regular updates, US Census Bureau information is being used at this time. The total population is provided below to shown general distribution of race and ethnicity in the community. The estimated number of persons that may not speak English “very well” is following in the US Census Bureau 2006-2010 American Community Survey.

The U.S. Census Bureau provides statistics from 2010 for the City of Canton as follows:

Total population = 74,451

Population by Ethnicity:

Hispanic or Latino = 1,805 Non Hispanic or Latino = 72,646

Population by Race:

White = 53,150 African American = 16,854, Asian = 193, American Indiana or Alaska Native = 372,

Native Hawaiian and Pacific Islander = 0, Other = 431, Identified by two or more = 3,451.

The US Census Bureau 2006-2010 American Community Survey 5-Year Estimates under SELECTED SOCIAL CHARACTERISTICS estimates the number of people in Canton who speak a language other than English to be 2,945 with those speaking English less than “very well” estimated at 1.0% or approximately 983 individuals who may be considered limited in English proficiency.

Factor 1(continued)-

According to the census numbers above there may be up to 983 individuals who live in the City of Canton that *may* be considered as LEP. Based on actual contact between City Staff and the community there have been very few requests from anyone in the service area asking the City to provide language translation services. Therefore, the LEP population is probably even less than the estimate shown above.

Factor 2- The frequency with which LEP individuals come into contact with the program, activity or service:

Due to the infrequent requests for translation services, there appears to be a minimal need for translation services from the City. This may be attributed to the high percentage of younger people (87.6% for ages up to 17) who are available as family members for translation services.

Factor 3. The nature and importance of the program, activity, or service provided by the program:

If at any time a LEP individual requests translation services that are considered important such that denial or delay of access or services or information could have serious or even life-threatening implications, the City will provide, upon request, services to assist the LEP population including translation of vital City documents and interpretation services.

Factor 4. The resources available to the City and costs:

The City of Canton currently has several staff members who are bilingual in English and Spanish and are available to translate requests from the Hispanic population on a day to day basis. The City also provides many of their outreach services in the predominate languages of the community, English and Spanish. In addition, certified translation services are available through LanguageLine Solutions, a telephone translation service that is accessible for phone line translations services 24 hours a day. These are services the City provides upon request as discussed in factor 3 above. Page | 12

Summary of LEP Accommodation Plan

- The City of Canton strives to serve its population to the best of its ability and will provide upon request, services to assist the LEP population including translation of vital documents and interpretation services deemed necessary to provide meaningful access to City services.
- A U.S. Census Bureau ISpeak card is available as part of this document and on the City's webpage and is also available at City Hall located at 414 Main Street. This card allows LEP individuals to communicate their preferred language to City Staff whereas City Staff may then access a translation service called LanguageLine, phone number 1-800-752-6096 is available to City Staff or other translation services may be used as determined by the City.
- For language translation requests from the Hispanic or Latino community the City has several staff member who are bilingual and are available to provide translation services on a day to day basis.
- The City of Canton utilizes a voluntary public involvement survey to collect information regarding persons affected by proposed projects. The survey permits respondents to remain

anonymous, while voluntarily answering questions regarding their gender, ethnicity, race, age, sex, disability status, and household income. This voluntary public involvement survey is available at all public hearings and meetings. Once the survey data has been collected, it will be reviewed and then the survey will be placed in a file for future reference. In the case enough surveys are collected over time to show a significant increase in LEP populations, the City may consider changes to their LEP policy. Completed surveys shall be retained for a period of three years from the date of the meeting and/or completion of the related project, if applicable. See Appendix G for a sample of this Survey.

- The City reviews written Title VI complaints and ensures every effort is made to resolve complaints informally at the local or regional level and review and update the City's Title VI plan and procedures as required.
- Staff for the City will be provided training on the requirements for providing meaningful access to services for LEP persons. Considering the relatively small size of the City of Canton and limited financial resources, current training may be limited to web access to this document and its attachments by all City Staff, a log showing the names of all Staff that have been made aware of this document (sign off that they have read the document) and require that all new employees receive the same training.

Signature and Proposal Pages

Signature Page

Sugarcreek Water Treatment Plant Filter Backwash Dechlorination Facility

To the Director of Public Service of the City of Canton:

The undersigned, having carefully examined the complete invitation to bid, herewith proposes to furnish all the labor and materials required to complete the **Sugarcreek Water Treatment Plant Filter Backwash Dechlorination Facility** in accordance with the specifications on file, including any and all work and materials that may be necessary to complete the project in a proper and workmanlike manner, and in accordance with the instructions in the bid packet and under the direction of and to the satisfaction of the Director of Public Service of said City.

The bidder hereby agrees that the Director of Public Service has the right to reject any and all bids and to accept the bid(s) deemed most beneficial to the City of Canton.

The bidder hereby certifies that the undersigned _____ is the only person interested in the bid and the bidder herewith certifies that no officer or employee of the City of Canton is in any manner interested therein.

The bidder herewith encloses a _____ **(BID BOND, CERTIFIED/CASHIER'S CHECK)** in the sum of \$ _____ dollars made payable to the CITY OF CANTON as a guaranty that if awarded the contract for the work included in the proposal, _____ will enter into contract therefore, with sureties satisfactory to the Director of Public Service, within the prescribed time of ten (10) days from the date of service of notice of award, otherwise such bond or checks shall become the property of said City, as liquidated damages of the failure on the bidder's part to do said contract within the specified time.

The bidder acknowledges receipt of Addenda Numbers: _____.

SIGNATURE OF BIDDER: _____.

NOTE: If bidder is a corporation, set forth the legal name of the corporation, together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation. If bidder is a partnership, set forth the name of the firm, together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership.

**Sugarcreek Water Treatment Plant
Filter Backwash Dechlorination Facility**

BID FORM- BID PROPOSAL SCOPE OF WORK

ITEM 1 FILTER BACKWASH DECHLORINATION FACILITY, COMPLETE

The lump sum bid for this item shall include furnishing all labor, materials, tools, and equipment for the Filter Backwash Dechlorination Facility at the Sugar Creek Water Treatment Plant at the location shown on the plans. All work performed by the Contractor and their subcontractors shall be coordinated with the Owner and Engineer to minimize outages, and maintain plant operations at all time during construction of the new improvements.

Under Item I, the Contractor shall clear brush, strip and pile topsoil, excavate, backfill, prepare subgrades to construct a new 384 square foot insulated metal building on the east drive adjacent to the Sludge Lagoon No. 1 at the Sugar Creek WTP. The Contractor shall survey the site, set benchmarks, locate and stake out the location of the building and structures. The Contractor shall excavate and dispose of excess materials on site to the proposed limits of the building foundation, and provide all formwork, materials, tools and equipment to construct the reinforced concrete footers, sump, and floor for the new building foundation.

Site work performed by the Contractor shall include installation of a precast concrete drain manhole, top cover with embedded aluminum floor door, manhole steps, and wall sleeves with watertight seals. The existing fence will be relocated by the Contractor, and the entire site graded, a new concrete drive apron, sidewalk, and gravel roadways provided.

The Contractor shall provide all labor, materials, tools and equipment to erect the insulated metal building shown on the plans and described in the specifications. All labor and materials shall be provided to install fiberglass floor grating, process piping, chemical feed pumps, piping, valves, accessories, and a buried corrugated plastic carrier pipe with chemical tubing.

Mechanical work shall include furnishing and installing a new water service, backflow preventer, hot water tank, eyewash, and appurtenances, unit heater, exhaust fans, louvers and dampers, and temperature controls as shown on the plans. A new electrical feed shall be installed in the existing conduit to provide power from the WTP, new conduit shall be provided where shown on the drawings, including extending existing ductbank, power panels, conduit, wiring, lighting, and controls as shown on the plans.

Throughout the duration of the project, the Contractor under Item No. 1 shall provide all labor, materials, tools, and equipment to maintain all slope protection and SWPPP provisions until work is complete. When work is completed, Contractor shall remove all SWPPP materials when final grassed areas have been established. Contractor will spread stored topsoil, and regrade all disturbed areas of new work, fix any replace damaged asphalt pavement, to establish proper elevations at the building, roadway, and surrounding areas that drain to existing 30" storm sewer, electrical ductbanks, material laydown areas, construction trailer parking areas, and any areas disturbed during construction of the lagoons. Repair, re-grade, and re-seed all disturbed areas.

Dispose off-site, all waste concrete and asphalt material removed from demolished roadways. Repair any asphalt pavement and walks as shown on the plans or damaged by construction traffic or construction of the new improvements. Perform water leak test on the drain manhole, sump, and piping accordance with the specifications, and repair any defective or leaking joints.

This item shall include the cost for all performance bonds, insurance, project management, site supervision, administrative costs, profit and overhead costs, mobilization costs, providing temporary construction facilities, temporary electrical service, sanitary facilities, water.

The successful BIDDER will be required to furnish a breakdown of the lump sum Bid in accordance with the General Conditions.

Payment will be made in accordance with the General Conditions.

ITEM 2 CONTINGENCY, BID ALLOWANCE

This item shall include a lump sum allowance of \$10,000 for payment as required for repairs and renovations due to changes in conditions or revisions based on actual field conditions. This item is over and above what is described in the Contract Documents and must be based on written proposals approved by the OWNER and/or Engineer.

The allowance shall be adjusted by Change Order if the final cost is more or less than the allowance.

**Sugarcreek Water Treatment Plant
Filter Backwash Dechlorination Facility**

Proposal Page

We (I), the above signed hereby propose to furnish the following article(s) and/or service(s) at the price(s) and terms stated subject to all instructions, conditions, specifications, and all attachments hereto. We (I) have read all attachments including the specifications and fully understand what is required.

(1)	(2)	(3)	(4)	(5)	(6)	(7 = 5 + 6)	(8 = 3 x 7)
Item	Description	Quantity	Unit	Labor Unit Price	Material Unit Price	Total Unit Price (Sum of Labor and Material)	Item Total
1.	Filter Backwash Dechlorination Facility, Complete	1	Lump Sum				
2.	Contingency, Bid Allowance	1	Lump Sum			\$10,000.00	\$10,000.00
BASE BID TOTAL							

Base Bid Price in Figures

Base Bid Price in Words

Base Bid and Alternate Base Bid Prices for Informational Purposes Only. Total Unit Prices will govern.