

**IIJA Richmond Heights Sanitary Sewer
Improvements**

City of Richmond Heights

**Northeast Ohio Regional Sewer District - MCIP
and WPCLF Funded Project**

May 2025



A handwritten signature in black ink, appearing to read "Timothy McLaughlin".

231100

CITY OF RICHMOND HEIGHTS

ADMINISTRATION

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Ryan Tiedman, Service Director

R. Todd Hunt, Director of Law

Tom DiLellio, Interim Finance Director

Travian M. Atkins, Interim Assistant Finance Director

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Juanita Lewis, Council-at-Large

Tracey Blair, Clerk of Council

ADVERTISEMENT FOR BIDS/PUBLIC NOTICE TO BIDDERS

Sealed bids will be received at the Caucasus Room, City of Richmond Heights 26789 Highland Road, Richmond Heights, OH 44143 until 3:00 p.m. on June 11, 2025 and will be opened and read immediately thereafter for the

IHA RICHMOND HEIGHTS SANITARY SEWER IMPROVEMENTS

NORTHEAST OHIO REGIONAL SEWER DISTRICT MCIP &WPCLF FUNDED PROJECT

OPINION OF PROBABLE CONSTRUCTION COST: \$690,000.00

ALTERNATE A - RADFORD SEWER: \$98,200.00

ALTERNATE B - RADFORD SEWER: \$70,000.00

COMPLETION DATE: MAY 1, 2026

The bid specifications and drawings (**but not the bid forms**) may be viewed and/or downloaded for free via the internet at <https://bids.verdantas.com>.

Bids must be in accordance with drawings and specifications and on forms available from the City of Richmond Heights at a non-refundable cost of One Hundred Dollars (\$100.00).

In the execution of this contract, the parties agree to adhere to environmentally responsible practices, including the promotion of recycling and waste reduction. Wherever applicable, materials used in the performance of this contract, the contractor shall recycle, reuse, or source from sustainable origins. The contractor will implement appropriate waste management measures to ensure compliance with local and federal recycling regulations. Additionally, the contractor shall dispose of any materials in an environmentally conscious manner, minimizing landfill contributions and prioritizing recycling initiatives. Failure to adhere to these recycling commitments may result in corrective actions or penalties as outlined in this contract. Please note that all contracts involving asphalt will require “Cold In-Place Recycling.”

There will be a Non-Mandatory Pre-Bid Conference on June 4, 2025 at 10:00 a.m. at the Caucasus Room, City of Richmond Heights 26789 Highland Road, Richmond Heights, OH 44143

This project will be funded by the Water Pollution Control Loan Fund Program as administered by the Ohio Environmental Protection Agency and the Ohio Water Development Authority. The Contractor shall note that there are Disadvantaged Business Enterprise participation goals for this project.

This procurement is subject to the EPA policy on encouraging the participation of small business in rural areas (SBRAs).

Publish: *The Plain Dealer*
May 21, 2025
May 28, 2025

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SECTION 1
BID DOCUMENTS

INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

- 1.1 Sealed bids shall be received by the Owner at the location specified and until the time and date specified in the Advertisement for Bids/Public Notice to Bidders.
- 1.2 Each bid shall contain the full name and address of each person or company interested in said bid. If no other person be so interested, the Bidder shall distinctly so state the fact.
- 1.3 Bid forms must be completed in ink or by typewriter. Any corrections to the bid forms prior to submission must be initialed by the person signing the bid. Failure to submit any bid form(s) or other required document(s) may be cause for rejection of the bidder's bid at the sole discretion of the Owner.
- 1.4 Bids by Corporations must be executed in the corporate name by the President, Vice President, or other officer accompanied by evidence of authority to sign and the corporate seal must be affixed and attested by the Secretary on the Corporate Resolution form.
- 1.5 Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature.
- 1.6 All names must be typed or printed below the signature.
- 1.7 The bid shall contain an acknowledgment of receipt of all Addenda.
- 1.8 If a Bidder wishes to withdraw their bid prior to the opening of bids, they shall state their purpose in writing to the Owner before the time fixed for the opening, and when reached it shall be handed to them unread.
- 1.9 After the opening of bids, no Bidder may withdraw their bid for a period of 120 days.

PART 2 EXAMINATION OF CONTRACT DOCUMENTS AND SITE

- 2.1 Before submitting a bid, each Bidder must
 - A. Examine the Contract Documents thoroughly.
 - B. Visit the site to familiarize themselves with local conditions that may in any manner affect cost, progress, or performance of the work.
 - C. Familiarize themselves with Federal, State, and local laws, ordinances, rules, and regulations that may in any manner affect cost, progress, or performance of the work.
 - D. Study and carefully correlate Bidder's observations with the Contract Documents.

- 2.2 Reference is made to the Specific Project Requirements for the identification of any reports of investigations and tests of subsurface and latent physical conditions at the site or otherwise affecting cost, progress or performance of the work which have been relied upon by the Engineer in preparing the drawings and specifications. Owner will make copies of such reports available to any Bidder requesting them if not made available with the bid documents. These reports are not guaranteed as to accuracy or completeness; nor are they part of the Contract Documents. Before submitting their bid each Bidder will, at their own expense, make such additional investigations and tests as the Bidder may deem necessary to determine their bid for performance of the work in accordance with the time, price and other terms and conditions of the Contract Documents.
- 2.3 Upon request, the Owner will provide each Bidder access to the site to conduct such reasonable investigations and tests as each Bidder deems necessary for submission for their bid.
- 2.4 The lands upon which the work is to be performed, rights-of-way for access thereto, and other lands designated for use by Bidder in performing the work are identified on the Drawings.
- 2.5 The submission of a bid will constitute an incontrovertible representation by the Bidder that they have complied with every requirement of this section and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the work.

PART 3 ESTIMATED QUANTITIES

- 3.1 In Unit Price Contracts, the quantities of the work itemized in the bid are approximate only and the bidders are hereby notified that the estimated quantities made by the Engineer are merely for the guidance of the Owner in comparing on a uniform basis all bids received for the work.
- 3.2 The contract quantities, where itemized, are based on plan horizontal and vertical dimensions unless otherwise specified. It is the Contractor's responsibility to verify and determine actual quantities of materials such as pipe, pavement, subgrade, etc. in their ordering materials.
- 3.3 Payments, except for lump sum contracts and except for lump sum items in unit price contracts, will be made to the Contractor only for the actual quantities of work performed or materials furnished in accordance with the plans and specifications.
- 3.4 The successful Bidder will be required to furnish the Owner with a complete breakdown of the lump sum bid items, to the satisfaction of the Engineer/Architect, before signing the Contract documents.

PART 4 CONTRACTOR'S QUALIFICATION

- 4.1 Bidder shall provide detailed information relating to similar projects completed within the past 5 years which demonstrates the bidder's capability, responsibility, experience, skill, and financial standing to undertake this type of project and shall include a list of all projects currently under construction including status and contact person.
- 4.2 Bidder shall own, have rental or lease agreements for, or otherwise have readily available any and all equipment and tools necessary for proper execution of the work. The Owner reserves the right to request lists of equipment or tools available for the project including sources.
- 4.3 Bidder shall provide pertinent information to the Owner relative to any pending suits or outstanding liens. If no information is provided by the Bidder, the Owner shall assume that any such suits or liens do not exist.
- 4.4 The Owner may require similar information on any or all subcontractors proposed by the Bidder.
- 4.5 Bids of corporations not chartered in the state in which the work will take place must be accompanied by proper certification that the corporation is authorized to do business in that state.

PART 5 SUBCONTRACTORS

- 5.1 The Bidder shall state on the appropriate bid form the names of all Subcontractors, Sub Consultants and other professional service providers proposed and the items of work they are to be assigned. All work not assigned to a Subcontractor shall be assumed by the Owner to be performed by the Bidder.
- 5.2 The Owner reserves the right to approve all subcontractors proposed by the Bidder. If the Owner, after due investigation, rejects the use of a proposed subcontractor, the apparent successful Bidder may either submit an acceptable substitution without increase in bid price or decline substitution and withdraw their bid without sacrificing their bid security. Any listed subcontractor to whom the Owner does not make written objection prior to award of contract, shall be deemed acceptable to the Owner.
- 5.3 Requests for changes of Subcontractor by the Bidder after the award shall be subject to the Owner's approval and shall not change the contract bid prices.
- 5.4 No contractor shall be required to employ any Subcontractor, person or organization against whom they have reasonable objection.

PART 6 BID REVIEW BY OWNER

- 6.1 The Owner reserves the right to reject any and all bids, to waive as an informality any and all irregularities, and to disregard all nonconforming, nonresponsive or conditional bids.

- 6.2 All extensions and totals of unit prices and quantities submitted as part of the bid shall be considered informal until verified by the Owner. All bids must be made on the forms contained herein and the bid prices must be written therein, in figures only. Unit prices shall be separately written for "Unit Price Labor," "Unit Price Material," and "Total Unit Price" for each item listed. Should an error in addition and/or multiplication be determined while checking the Contractor's math and verifying their total bid, the "Unit Price Labor" and the "Unit Price Material" figures shall govern in determining the correct "Total Unit Price" and the correct "Item Total."
- 6.3 Each bidder must bid on all Items, Alternates, Deductions, and Additions contained in the Bidding Forms. All bids not in conformity with this notice may be considered non-responsive and may be rejected.
- 6.4 More than one bid for the same work from an individual or entity under the same of different names will not be considered. Reasonable grounds for believing that any bidder has an interest in more than one bid for the work may be cause for disqualification of that bidder and the rejection of all bids in which the bidder has an interest. A subcontractor or supplier is not a bidder, and may submit prices to multiple bidders.
- 6.5 In evaluating bids, the Owner may consider:
- A. The qualifications and experience of the Bidder, proposed subcontractors, and principal material suppliers as outlined in the plans and specifications.
 - B. Financial ability and soundness of the Bidder and proposed subcontractors.
 - C. Completeness of all bid forms and bid requirements.
 - D. Alternates and unit prices requested in the Bid Forms.
 - E. Unit prices or schedules of values that are or appear to be unbalanced.
 - F. Previous contractual experience with the Owner.
 - G. Whether or not the bid package complies with the prescribed requirements.
 - H. The proposed completion date, if applicable.
 - I. Any other matter allowed by law or local ordinance or resolution.
- 6.6 Owner may conduct further investigations as they deem necessary to assist in the evaluation of any bid and to establish the responsibility, qualifications, and financial ability of the Bidder, proposed Subcontractors, and other persons and organizations to do the work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.
- 6.7 Owner reserves the right to reject the bid of any Bidder who does not pass any such evaluation to Owner's satisfaction.

- 6.8 The Contract award shall be based on the lowest and best bid or lowest responsive and responsible bid (as applicable for the public contracting agency receiving bids) for the base bid and selected alternate items (if any) for this project.

PART 7 BID SECURITY

- 7.1 Each bid must be accompanied by a certified or cashier's check in the amount of 10% of the amount bid, an irrevocable letter of credit in the amount of 10% of the amount bid or an original bond in the amount of 100% of the amount bid per ORC 153.54 and 153.571. The certified or cashier's check, or irrevocable letter of credit shall be from a financial institution authorized to transact business in the State of Ohio and acceptable to the Owner. The bond shall be underwritten by a Surety Company authorized to transact business in the State of Ohio having an Ohio agent and listed on the most current Department of the Treasury Circular 570, "Surety Companies Acceptable on Federal Bonds." The bond shall be a "Bid Guarantee and Contract Bond" ("rollover bond") per O.R.C. sections 153.54 and 153.571 submitted for the full amount of the bid **including all alternates**, if any.

If bid security is made by bond, the Bidder and their Surety shall sign the Supplemental Bond Acknowledgement form and submit with their bid.

- 7.2 The certified or cashier's check, irrevocable letter of credit, or bond shall be made payable to the Owner and shall serve as a guarantee that in the event the bid is accepted and a contract is awarded to the successful Bidder, the contract will be executed by the bidder including any certifications, certificates or additional bonds required by the contract.
- 7.3 Failure on the part of the successful Bidder to execute the contract documents will cause the certified or cashier's check, irrevocable letter of credit, or bond to be forfeited to the Owner as damages.
- A. If the Owner awards the contract without rebidding, the Bidder (and the Surety on their bond if a bond was submitted) shall be liable to the Owner for a penal sum not to exceed the difference between the low bid and the next lowest bidder or 10% of the amount of the bid, whichever is less.
 - B. If the Owner does not award the Contract to the next lowest Bidder, but resubmits the project for bidding; the Bidder (and the Surety on their bond if a bond was submitted) shall be liable to the Owner for a penal sum not to exceed the costs in connection with the resubmission of bids or 10% of the amount of the bid, whichever is less.
- 7.4 Checks or letters of credit for bid security of all bidders will be returned in the manner and timeframe stipulated in the Ohio Revised Code.

PART 8 CONTRACT BOND

- 8.1 As security for faithful performance and payment of all obligations under the Contract, the Owner shall require and the successful Bidder shall furnish either:
- A. *If submitted as Bid Security at time of bid:* "Bid Guarantee and Contract Bond" (AKA "rollover bond") per O.R.C. sections 153.54 and 153.571.
 - B. *If a cashier's check or irrevocable letter of credit is submitted as Bid Security at time of bid:* Contract Bond per Ohio Revised Code Sections 153.54 and 153.57, in the amount of 100% of the Contract Price. The Contractor and their Surety shall sign the Supplemental Bond Acknowledgement form and submit with the Contract forms
- 8.2 The bond shall be underwritten by a Surety Company authorized to transact business in the State of Ohio having an Ohio agent and listed on the most current Department of the Treasury Circular 570, "Surety Companies Acceptable on Federal Bonds."
- 8.3 The contract bond shall cover correction of the work for the period stated in the specifications and the correction period shall start upon Final Acceptance of the entire project and final payment by the Owner.
- 8.4 Nothing in the performance of the Engineer's service to the Owner in connection with this project shall in any way imply any undertaking for the benefit of the successful Bidder, its subcontractor(s), or the surety of any of them.

PART 9 AWARD AND EXECUTION OF CONTRACT

- 9.1 After the Owner's legislative body awards the project, the successful bidder will receive the unsigned contract documents. Within 10 days after their receipt, the successful Bidder shall sign and deliver to the Owner said contract documents including any certifications, certificates, or additional bonds required by the contract.
- 9.2 The Owner shall execute the Contract within 120 days after the day of the bid opening. When necessary and by mutual consent between the Owner and the Successful Bidder, this 120-day period may be extended.
- 9.3 The date of the Owner's signature on the Contract Agreement shall be the effective contract date.
- 9.4 The Owner shall execute and deliver to the successful Bidder one set of fully executed contract documents.

PART 10 INSURANCE

- 10.1 Verification of limits for public liability, property damage, automobile, Worker's Compensation, or any other insurance required by the provisions of this Contract must be submitted to the Owner prior to execution of the Contract.

- 10.2 All insurance shall be endorsed so that it cannot be cancelled for non-payment of premium for 10 days or cancelled or non-renewed for any other reason in less than 30 days after a written notice of such proposed action by the insurer is given to the Owner. The cancellation clause on the Certificate(s) of Insurance shall read as specified in the Supplementary Conditions and failure to submit an insurance certificate and/or policy endorsement verifying same shall be reason for the Owner to consider the Contractor non-responsive in complying with the requirements for contract execution and may be cause for forfeiture of the Bid Security to Owner.
- 10.3 The Insurer's affording coverage shall be authorized to transact business in the State of Ohio and be listed on the most current Ohio Department of Insurance list of Ohio Licensed Companies.
- 10.4 The Contractor's Liability Insurance policy(s) shall be endorsed such that limits are on a Per Project basis.
- 10.5 The Contractor shall also provide an Owner's and Contractor's Protective Policy.

PART 11 NON-COLLUSION AFFIDAVIT

- 11.1 Collusion between bidders will be cause for rejection of affected bids and may be cause for rejection of all bids. Multiple bids submitted by one bidder under the same name or different names, whether as an individual, firm, partnership, corporation, profit or non-profit, affiliate, or association will be cause for rejection of bids. A subcontractor is not a bidder, and may submit prices to multiple bidders.
- 11.2 All bidders shall submit an affidavit that their bid is genuine and not collusive or sham; that such bidder has not colluded, conspired, connived, or agreed, directly or indirectly, with any bidder or person, to put in a sham bid, or that such other bidder or person shall refrain from bidding; that such bidder has not in any manner, directly or indirectly sought by agreement or collusion, or communication or conference, with any person, to fix the bid price of affiant or any other bidder, or to fix any overhead, profit or cost element of said bid price, or of that of any other bidder, or to secure any advantage against the Owner or any person or persons interested in the proposed contract; that such bidder is the only party (or parties) who has an interest with the bidder in the profits of any contract which may result from the herein contained proposal; that no individual affiliated with the Owner, including but not limited to the head of any department, any employee, or any other official or officer of the Owner, is or will be directly or indirectly interested in this bid, and/or the profits from this bid if successful; that no individual affiliated with the Owner, including but not limited to the head of any department, any employee, or any other official or officer of the Owner, has or will receive anything of value as a result of the submission of this bid or its award; that no individual affiliated with the Owner, including but not limited to the head of any department, any employee, or any other official or officer of the Owner, has been solicited to provide assistance and/or provided assistance to the bidder which might give the bidder a competitive advantage or circumvent the competitive bidding process; and that all statements contained in said proposal are true; and further, that such bidder has not, directly or indirectly submitted this bid, or the contents thereof, or divulged information or data relative thereto to any association or to any member or

agent thereof.

- 11.3 Each bid must be accompanied by a completed Noncollusion Affidavit provided within the contract documents.
- 11.4 Where there is reason to believe collusion or combination among bidders exists, the Owner reserves the right to reject the bid of those concerned.

PART 12 DELINQUENT PERSONAL PROPERTY STATEMENT

- 12.1 Included with the contract documents is a Delinquent Personal Property Statement to be filled out by the successful Bidder.
- 12.2 The statement shall be sent to both the County Auditor and the County Treasurer. A signed copy shall remain in the contract documents as well.

PART 13 ORIGINAL DOCUMENTS

- 13.1 All bid forms, contract forms, bonds and any other bid documents or contract documents requiring signatures shall be submitted with original signatures. No photo copies or faxed copies of signed documents shall be accepted.

PART 14 ADDENDA

- 14.1 The bidder shall be responsible to obtain Addenda from the web at <https://bids.verdantas.com>.

END OF SECTION 10/31/23

PRICES TO INCLUDE

PART 1 - GENERAL

Any work shown on the plans or required in the specifications, but not paid for separately as a bid item, shall be included in the cost of other bid items. The amount bid for each Bid Item shall include the following:

- 1.1 All labor, materials, tools, equipment, and transportation necessary for the proper execution of the work in accordance with the Contract Documents.
- 1.2 All labor, materials, tools, equipment necessary to perform restoration of all areas impacted during construction to pre-construction conditions or better.
- 1.3 All assistance required by the Engineer to verify compliance with the Contract Documents, including measuring for final pay quantities.
- 1.4 Project coordination and scheduling.
- 1.5 Detailed breakdown of lump sum bid items as requested by the Engineer.
- 1.6 All provisions necessary to protect workmen, the general public, and property along the work in accordance with the Contract Documents.
- 1.7 Protection and/or replacement of existing property corner monuments.
- 1.8 Record drawings of the installed location of all underground electrical conduit, sewers, tees, wyes, laterals, etc.
- 1.9 Reimbursement to Owner for costs of re-inspection or re-testing of any work not installed in compliance with the Contract Documents.
- 1.10 All erosion control measures needed commensurate with the contractor's means and methods.
- 1.11 Construction staking of the improvements.
- 1.12 Coordination and communication with any and all property owners of which will be indirectly or directly impacted by improvements.
- 1.13 The unit price shall include saw cutting, removal and disposal if the proposal item includes removal.
- 1.14 Pavement striping required with pavement replacement and/or curb ramp installation.
- 1.15 Temporary mailboxes, including the removal, storing, and reinstalling of any existing mailboxes impacted by the project.
- 1.16 Removal and reinstallation of any street signs necessary to complete the work.

PART 2 - ITEMS

All work proposed by this contract shall be quantified and paid for in accordance with the pertinent O.D.O.T. specification except as specifically altered by other provisions of this contract. No slag or recycled materials, including recycled asphalt products (RAP) are permitted for use for any aspect of this project.

2.1 (SPC) PRECONSTRUCTION VIDEOTAPE DOCUMENTATION

Basis of Payment

The lump sum price shall include all costs associated with hiring a professional videotaping firm to document in detail the existing conditions of the entire work area and potential disturbed areas and submitting a high quality DVD with audio commentary and video log. The unit price shall also include mobilization, setup, televising the lateral sewer pipe from the main to the Right-of-Way, accurately measuring the location of connecting pipes or test tee/risers, DVDs, inspection logs, and the furnishing of all labor, material, tools and appurtenances necessary to complete the work as specified or as shown. DVDs and logs shall be turned over to the Owner prior to payment for this item.

2.2 (SPC) BONDS AND INSURANCES, AS PER PLAN

Basis of Payment

A "Bonds and Insurances" item (including "Owner/Contractor Protective Policy," "All Risk Builder's Risk Insurance," and/or "Installation Floater Insurance", and/or endorsements to fully comply with all contract requirements) has been included in the bid proposal.

2.3 (201) TREE REMOVED INCLUDING STUMP, AS PER PLAN

Method of Measurement

The method of measurement shall be as per ODOT 201.

Basis of Payment

The unit price per each shall include removal of yard trees as designated within the plans. Item shall also include removal of stumps, and buried root system to facilitate construction of the sewer.

2.4 (202) SANITARY SEWER ABANDONED, GROUT FILLED, AS PER PLAN

Method of Measurement

The quantity to be paid shall be the lineal horizontal footage of pipe abandoned, measured along the centerline of the pipe. The measurement will be taken for each diameter of sewer being abandoned.

Basis of Payment

The basis of payment shall be made at the contract unit price per linear foot of pipe abandoned. This payment will be full compensation for all work necessary to complete the abandonment and grouting process.

2.5 (202) PIPE REMOVED, 24 INCH AND UNDER, AS PER PLAN

Method of Measurement

The quantity to be paid shall be the lineal horizontal footage of pipe removed (24" inside diameter and under) measured along the centerline of the pipe. The measurement will be taken for each diameter of pipe being removed.

Basis of Payment

Payment shall be made in accordance with ODOT Item 202.

2.6 (253) TYPE "A" PAVEMENT REPLACEMENT (CONCRETE), ROADWAY, AS PER PLAN

2.7 (253) TYPE "A" PAVEMENT REPLACEMENT (CONCRETE), DRIVEWAY OR APRON, RESIDENTIAL, AS PER PLAN

2.8 (253) TYPE "C" PAVEMENT REPLACEMENT (ASPHALT), ROADWAY, AS PER PLAN

Method of Measurement

The method of measurement shall be as per ODOT 253 or 255 as applicable with the exception that lengths used for calculation of each individual repair area shall not exceed the maximum pay length indicated on the drawings.

Basis of Payment

The basis of payment shall be as per ODOT 253 or 255 as applicable with the following additions: The unit price shall also include saw cutting; integral or non-integral curb removal; integral curb replacement; furnishing, installation, maintenance, removal, and disposal of temporary road materials or temporary pavement courses; preparation for permanent pavement courses; and any additional expenses for cold weather protection.

2.9 (603) 8 INCH - 15 INCH SANITARY SEWER HEAVY CLEANING, AS PER PLAN

Method of Measurement

The quantity to be paid shall be the number of linear feet cleaned per the specifications measured centerline to centerline of manholes.

Basis of Payment

The unit prices for the various sizes of pipes shall include furnishing water, cleaning equipment, root and encrustation removal, the complete removal and disposal of debris as per NASSCO guidelines for heavy cleaning of sewers. This item shall include pre and post cleaning CCTV per NASSCO guidelines. Any section that is reviewed by the Engineer and determined to not be completing cleaned shall be recleaned and televised at no additional cost to the Owner. This will be only be utilized as authorized by the Engineer.

2.10 (603) 8 INCH CURED-IN-PLACE PIPE LINING

Method of Measurement

The quantity to be paid shall be the number of linear feet installed per the specifications measured inside wall to inside wall of manholes for the mainline.

Basis of Payment

The unit prices for the various sizes of liner pipe shall all required preparation and performatory work as required by NASSCO and project specifications including but not limited to; sewer cleaning, measurements of existing pipe size and length, to verify plan notes, determination of live connections, sewage bypassing, liner material and installation, processing, cooling, sealing of liner at manholes, testing, post-installation video recording, cleanup, restoration, and the furnishing of all labor, material, tools and appurtenances necessary to complete the work in accordance with these specifications, the manufacturer's recommendations, or as shown. The minimum thickness of the liner material shall be as specified on the Plans.

2.11 (603) MAINLINE TEE AND LATERAL SEALING WITH CIPP LATERAL-TO-MAINLINE CONNECTION (AKA TOPHAT STYLE), AS PER PLAN

Method of Measurement

The quantity to be paid shall be the number of sanitary laterals lined as directed by the Engineer.

Basis of Payment

The unit prices for the various sizes of liner pipe shall include sewer lateral cleaning, heavy cleaning, measurements of existing pipe size and length to verify plan notes, determination of live connections, sewage bypassing, liner material and installation, processing, cooling, sealing of liner at ends, the sealing of LMK T-Liners in sewer laterals, root removal, testing, post-installation videotaping, cleanup, restoration, and the furnishing of all labor, material, tools and appurtenances necessary to complete the work in accordance with these specifications, the manufacturer's recommendations, or as shown. No additional payment will be made for transitions in pipe sizes at the wye/tee connection or within the proposed lining segment within \pm 1 inch of the specified native material size.

2.12 (603) CONNECTION REINSTATEMENT, AS PER PLAN

Method of Measurement

The quantity shall be the number of reinstatements performed in accordance with the plans and specifications and as directed by the Engineer.

Basis of Payment

The unit price shall include the furnishing of all work necessary to neatly cut the liner pipe at the live service connection locations and the furnishing of all labor, material, tools and appurtenances necessary to complete the work as specified or as shown.

2.13 (603) BULKHEAD EXISTING PIPE, AS PER PLAN

Method of Measurement

The unit price stipulated per each (EA) bulkhead of the existing pipe. This includes all necessary excavation, preparation, and construction activities.

Basis of Payment

Payment will be made at the contract unit price per bulkhead. This covers all labor, materials, equipment, and incidentals, including excavation, preparation, construction, backfilling, and site restoration

2.14 (604) MANHOLE REHABILITATION CLEANING AND LINING, 48 INCH DIAM., AS PER PLAN

Method of Measurement

The quantity to be paid shall be the number of vertical feet rehabilitated as measured from the lowest sewer to the top of the manhole casting. Average inner diameter is approximately that of which is listed in the manhole improvement schedule on the plans. No additional payment shall be made for any diameter or net area that exceeds a that of the listed diameter on the plans.

Basis of Payment

The unit price paid shall include sewage flow control; cleaning, removal and disposal of all calcifications, removal of steps, chimney seal, pipe seals, lining of manhole, material testing, verification of cured liner materials, and the furnishing of labor, materials, tools and appurtenances necessary to complete the work as specified or as shown. The liner thickness shall be per the approved manufacturer's recommendations. Any additional rehabilitation such as replacement of bricks, repair or replacement of invert or benches, manhole patching, or resetting of castings, shall be included within this item.

- 2.15 (452) 6-INCH NON-REINFORCED CONCRETE DRIVES AND APRONS, CLASS QC MS, INCL. FIBER REINFORCING, INCLUDING REMOVAL, AS PER PLAN
- 2.16 (608) 4 INCH CONCRETE WALK, INCLUDING REMOVAL, AS PER PLAN
- 2.17 (608) 6 INCH CURB RAMP, INCLUDING FIBROUS REINFORCING, INCLUDING REMOVAL, AS PER PLAN

The work, method of construction and materials for concrete walk, concrete curb ramps and concrete pavement for drives shall conform to ODOT Items 608, 452, 304, 203 and 202, except as modified herein or as shown on the contract drawings.

- A. There will be no separate measurement or payment for removal and disposal of existing walk or concrete drives or subbase, crushed limestone base, and subgrade compaction. These items of work shall be included in the furnishing and installation of new walks or curb ramps or concrete pavement for drives.
- B. Wire mesh reinforcing shall be furnished and installed if included in an existing apron. The cost of furnishing and installing the wire mesh reinforcing shall be included in the cost of this item of work.
- C. The unit price shall include Fiber Reinforcement as indicated.
- D. There will be no additional compensation for providing a thickened edge and/or integral curb, as detailed.
- E. ODOT Item 499 Concrete, Class QC1 shall be used for walks and curb ramps.
- F. Each and every sidewalk, drive slab and joint shall be edge tooled after texturing surface to match existing.
- G. ODOT 304 Aggregate Base, utilizing crushed limestone, shall be provided with these items.
- H. The unit price for curb ramps shall include all labor and materials necessary to construct ramps compliant with the Americans with Disabilities Act (ADA) regulations.

Method of Measurement

The quantity to be paid of concrete walk and concrete curb ramps to the thickness and class of concrete specified shall be the actual square dimension, square feet or square yards as indicated in the Proposal of finished surface complete in place.

Basis of Payment

The unit price stipulated per square foot or square yards (as indicated in the Proposal) for concrete walk and concrete curb ramp of the thickness and class of concrete specified shall be full compensation for furnishing all materials, grading, forming, finishing of the walk, curb ramp and pavement including removal and disposal of existing grass, sod, topsoil, bushes, trees, walk or pavement and curbs, necessary pavement saw cutting, clearing and grubbing, excavation and/or backfill to required line and grade, subgrade compaction as required, furnishing and installing subbase or base material, integral curbing, adjustment of water/gas service valves, concrete, curing compound, and expansion joint material; wire and/or mesh reinforcing as required; furnishing of all labor, tools, materials and equipment necessary to complete the work as specified or as shown.

2.18 (609) COMBINATION CURB AND GUTTER, ALL TYPES, INCLUDING REMOVAL, AS PER PLAN

ODOT Item 499 Concrete, Class QC MS mix shall be used for all curb.

Basis of Payment

Payment shall be made in accordance with ODOT Item 609 and shall also include full depth diamond blade saw cutting as needed and removal of existing pavement, curb, or curb and gutter.

2.19 (611) 6 INCH SANITARY SEWER LATERAL RECONNECTIONS, AS PER PLAN

Method of Measurement

The quantity to be paid shall be the number installed per the plans and specifications.

Basis of Payment

The unit price bid for lateral reconnections shall include wye or tee, mission couplings, up to fifteen (15) feet of 6" SDR-26 lateral pipe including any riser section, up to three bends, excavation, bedding, backfill and compaction, and the furnishing of all labor, materials, tools and appurtenances necessary to complete the work as specified or as shown. The unit price shall also include the documentation of all lateral locations and reconnections.

2.20 (611) SANITARY SEWER, ALL SIZES, AS PER PLAN

The work, method of construction and materials for sewer construction shall be in accordance with ODOT Item 611 with the modifications shown on the improvement plans and detailed in the specifications.

Method of Measurement

The quantity of sewer to be paid for shall be determined for gravity sewers by the linear feet difference in horizontal stationing as noted in the plans or as directed by the Engineer.

Basis of Payment

The unit price stipulated per lineal foot for sewer pipe of the various sizes and types specified shall be irrespective of class of pipe and depth and if not called out as a separate pay item, shall be full compensation for maintenance of traffic for the duration of the project; earth and/or rock excavation for the pipe and foundation for same, including clearing and grubbing; removal of all materials necessary for placing the pipe; the complete removal of the existing sanitary and storm sewers, manholes and catch basins except materials listed separately; furnishing and placing granular, low strength mortar or concrete bedding and special backfill as required; testing of compaction; constructing and subsequently removing all necessary boring and receiving pits, cofferdams, cribs, sheeting and shoring; furnishing, installing and operating necessary pumps, pipes and appurtenances necessary for flow bypassing and/or trench dewatering; sealing or banding all pipe joints where required; furnishing and installing of the pipe jointing materials and

all necessary plugs, bulkheads, bends, fittings, specials and branches of a type at least equal to the conduit of which it becomes part; furnishing and installing concrete encasements, boring and steel casing pipe where required; protection, verification and/or replacement of all existing utilities, i.e., gas mains, gas connections water mains (including hydrants and their connections to the main), water connections, water wells, septic tanks, sanitary sewers, sanitary connections, storm sewers, storm connections, curb drains, catch basins, culverts, electric or telephone underground cables and/or underground connections if damaged by the Contractor; protection of existing trees or vegetation; joining of the pipe to existing and proposed manholes, catch basins, structures, and other appurtenances as required whether temporary or permanent; pipe adapters and/or couplings needed to connect to existing sewer irrespective of size; leakage testing; internal post installation videotaping; disposal of all surplus and unsuitable materials; furnishing and installing temporary stone trench topping of pavement and driveways; removal and reinstallation or replacement of poles, posts, signs, mailboxes, paper boxes, fences, landscape timbers, guardrails, sign wiring, fixtures and other appurtenances disturbed or damaged by the construction of the sewer or associated activity; removal and replacement of any damaged curbing, sidewalk, driveways, parking lots and roadways as directed by the Engineer and/or called out as a separate pay item; and the furnishing of all labor, tools, materials and equipment necessary to complete the work as specified or as shown.

2.21 (611) SANITARY MANHOLE, ALL SIZES AND TYPES, AS PER PLAN

Method of Measurement

The number of each (EA) type manhole or junction chamber to be paid for shall be the actual number furnished and built in place in accordance with the contract drawings, specifically the Precast Concrete Manhole detail on Sheet 10C-14, and with these specifications.

Basis of Payment

The unit price shall be irrespective of the depth of the structures, and shall include the furnishing and construction in place of the manholes and junction chambers complete with excavation; foundation; backfill; frame and cover; steps; concrete; steel reinforcement; lining material; bricks; mortar; plastering; precast manhole sections; transition; flexible joints; granular backfill under proposed or existing pavements, walks, drives, existing drainage structures, and disposal of all undesirable material; testing and inspections; and the furnishing of all labor, materials, tools and appliances necessary to complete the work as specified or as shown. The unit price shall also include the removal of the existing manhole and all sewer stubs and plugs or connection of existing sewers to the structure as indicated on the contract drawings or directed by the Engineer. Adjustments in final casting elevations of plus or minus one (1) foot shall be included in the price for each structure.

2.22 (611) SANITARY MANHOLE INSIDE DROP CONNECTION, AS PER PLAN

Basis of Payment

Payment for the sanitary manhole with an inside drop connection will be made at the lump sum price. This price shall include all labor, materials, equipment, and incidentals necessary to

complete the work in accordance with the details shown on sheet 20S-0; additional piping and coring needed from new inside drop manhole to existing access manhole HIE01000.

2.23 (611) SANITARY MANHOLE OUTSIDE DROP CONNECTION, AS PER PLAN

Method of Measurement

The number of each (EA) exterior drop structure to be paid for shall be the actual number furnished and built in place in accordance with the contract drawings, specifically the Precast Concrete Drop Manhole detail on Sheet 10C-13, and with these specifications.

Basis of Payment

The unit price shall be irrespective of the depth/length of the structures, and shall include all materials, labor, equipment, tools, and appurtenances necessary to complete work as detailed on the plans including but not limited to any bypassing or plugging of flow, abandonment or removal of existing structures or pipe, removal and disposal of any excess materials necessary to complete the work, construction of invert to allow a smooth and laminar transition of flow from bottom of proposed interior drop, and all necessary cleaning, preparatory work, installation, and verification or operation for the drop structure in accordance with the manufacturer's and project specifications.

2.24 (611) MANHOLE, MISC.: CONNECTION TO EXISTING MANHOLE AS PER PLAN

Method of Measurement

The quantity to be paid shall be the number of new pipe connections installed in existing manhole structures per the plans and specifications.

Basis of Payment

The unit price stipulated per each (EA) connection to existing pipes, manholes or structures shall be irrespective of the depth, class and size of pipe and shall include furnishing and connecting, the pipe, pipe adapters and/or couplings, field coring or cutting existing manholes, fittings, bedding, backfilling, jointing material, bulkheads, concrete collars, rechanneling of the existing manhole invert as needed, removal and disposal of existing pipes and debris, and pumping required for adequate handling of flow bypassing.

2.25 (614) MAINTAINING TRAFFIC, AS PER PLAN

The work, method of construction and materials for maintaining traffic shall be in accordance with ODOT Item 614 and the Ohio Manual of Uniform Traffic Control Devices.

Basis of Payment

The lump sum price stipulated for maintaining traffic shall include all costs for labor, materials, tools and appurtenances necessary to complete the work as specified. Payment shall be made

progressively throughout the contract period in proportion to the percentage of work complete or as otherwise approved by the Engineer.

2.26 (680) SPECIAL – SITE RESTORATION

Basis of Payment

The lump sum price shall include restoration of all areas impacted during construction to pre-construction conditions or better, and the furnishing of all labor, materials, tools and appurtenances necessary to complete the work as specified or as shown. This will be for areas disturbed not defined by other pay items or as items the Contractor shall be responsible to pay in the event they require restoration. Any area disturbed outside of the improvement areas, permanent easements, or temporary access areas shall be responsibility of the Contractor to restore to it pre-construction condition without any additional payment.

2.27 CONTINGENCY/DISCRETIONARY ALLOWANCE

Basis of Payment

Contingency/Discretionary Allowance has been included in the Bid Proposal in each contract to be utilized as directed by the Engineer for unscheduled work items not included on the proposal forms or other changes in the work. The contingency allowance or portions thereof shall only be released upon execution of approved Change Orders or as approved by the Engineer. Any portion of the allowance not utilized shall be credited to the Owner.

CONTRACT COMPLIANCE PROCEDURES

(For Vendors, Contractors, and Material Suppliers)

City of Richmond Heights

Cuyahoga County, Ohio

The City of Richmond Heights, Ohio under the provisions of State law, is expected to make contract awards to the lowest and best bidder. Pursuant to this aim, the City has adopted rules and regulations which provide that contracts exceeding \$2,500.00 for services and \$10,000.00 for material suppliers and vendors, must be reviewed by the Equal Opportunity Coordinator prior to contract award. The purpose of this review is to ascertain the bidder's Equal Employment Opportunity efforts and intent.

1. All notices to prospective bidders on items in excess of \$2,500.00 for services and \$10,000.00 for material suppliers and vendors provides that all bidders must comply with the Contract Compliance procedure for Equal Opportunity as stipulate by the City of Richmond Heights.
2. As a part of a bid documents submitted by a bidder, an Affirmative Action Certification and an Employment Data report, as promulgated by the Equal Opportunity Coordinator and attached herewith, shall be completed. This report includes data relevant to the employment policies and practices of the bidder. Failure to submit the Equal Employment Opportunity bidder data as required, will deem the bid non-responsive and void. In the case of construction contracts in excess of \$10,000.00 compliance certification with the Cleveland Equal Employment Plan, (CEEP) and the Certification to Ensure On-Site Minority Percentage are also required to be submitted with the bid in addition to the Employment Data Report.
3. (a) The Finance Department shall forward a copy of the Equal Employment Opportunity bid documents received with the bid to the Equal Opportunity Coordinator for review and recommendation.

(b) If a bidder has multiple contracts with the City of Richmond Heights, each of which is less than \$2,500.00 for services, but together exceed \$2,500.00, than the total dollar volume determines coverage under these rules.

Material suppliers and vendors having multiple contracts, each of which is less than \$10,000.00, but together exceed \$10,000.00, than the total dollar volume determines coverage under these rules.

(c) The city of Richmond Heights reserves the right to establish exemptions at its discretion.
4. Following receipt of the Employment Data Report submitted by the bidder and prior to actual award of the contract, the apparent successful bidder shall be required to attend a pre-award Equal Employment Opportunity conference if such a conference is requested by the Equal Opportunity Coordinator. At that time, it may be required for the bidder to submit additional information on his Affirmative Action Program for Equal Employment Opportunity. Subsequently, the Equal Opportunity Coordinator shall determine the acceptability and effectiveness of the Affirmative Action Program submitted by the lowest and best bidder and shall submit findings to the City of Richmond Heights.

5. The Equal Opportunity Coordinator is responsible for monitoring the Equal Opportunity efforts of each contractor, sub-contractor, vendor or supplier after the contract award. Post-contract monitoring will include, but be limited to, the following procedures:
 - (a) The filing of any reports as established and required by the Equal Opportunity Coordinator of the City of Richmond Heights. Where a construction contract exceeds \$10,000.00, Monthly Minority Manpower Utilization Reports, as prescribed by the Department of Labor, Office of Federal Contract Compliance, will be submitted to the Equal Opportunity Coordinator of the City of Richmond Heights.
 - (b) Post-award compliance reviews will be scheduled with the contractor, subcontractor, vendor or material supplier to determine adherence to the City's EEO regulations.
6. The Equal Opportunity Coordinator will issue a written warning to the employer if the Equal Opportunity Coordinator determines that the contractor is deficient in its efforts to achieve Equal Opportunity. This warning will specify the contractor's areas of non-compliance and request that it provides data within a reasonable period of time to demonstrate his good faith efforts in achieving compliance.

Upon review of the employer's good faith efforts, the Equal Opportunity Coordinator may wish to confer with the employer for the purpose of offering assistance and to secure reasonable assurances from the employer that the Equal Opportunity deficiencies will be corrected.

7. Failure to comply with the Equal Employment Opportunity contract procedures as established by the City of Richmond Heights shall result in any or all of the following sanctions subject to approval by the Council of the City of Richmond Heights:
 - (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 the contract;
 - (b) Refusal of all future bids for any public contract with the City of Richmond Heights until such time as the contractor, subcontractor, vendor, or supplier demonstrates that it has established and shall execute an acceptable Equal Opportunity Program;
 - (c) Cancellation of the public contract and declaration of forfeiture of the performance bond.



Director of Finance
26789 Highland Road
Richmond Heights, OH 44143-2707
P: 216.486.2474 F: 216.383.6320
richmondheightsohio.org

RE: Prevailing Wage Rates

To Whom It May Concern:

In order to comply with Section 4115.071 of the Ohio Revised Code Prevailing Wage Rates, it will be necessary for you to supply us with the following:

1. Payroll dates for your employees.
2. A copy of each payroll which must include:
 - A. Employee's hours
 - B. Rate of pay
 - C. Job classification
 - D. Fringe benefit payments
 - E. Deductions.
3. Contractors and subcontractors are required to deliver certified copies of their payrolls to the prevailing wage coordinator within three weeks of the pay date.
4. Contractors and subcontractors are required to file with the prevailing wage coordinator upon completion of the project and prior to final payment, an affidavit stating he has complied with Chapter 4115 of the Ohio Revised Code.

As Prevailing Wage Coordinator for the City of Richmond Heights, it is my responsibility to insure that each contractor complies with the prevailing wage rates of the Industrial Commission of the State of Ohio. If you have any questions regarding this matter, please contact this officer.

Tom DiLellio,
Interim Finance Director

BID FORMS

The bid forms are not available online. The bid forms are available only by purchasing a set of plans and specifications at the location indicated in the Advertisement for Bids/Public Notice to Bidders.

SECTION 2
CONTRACT FORMS

NOTICE OF AWARD

TO: «ContractName»
«ContractAddr»
«ContractCity», «ContractState» «ContractZip»

PROJECT: «TitleCaps»

You are notified that your Bid which was opened on «Bidopening» has been accepted for items in the amount of «ContractDollars» at the unit bid prices as reflected in the bid tabulation contained herein for the *(fill in awarded parts, i.e. for Base Bid and Alternate C, or delete)*.

You are required by the Instructions to Bidders to execute the Agreement and furnish the required Bonds, Certificates of Insurance, and other documents within 10 calendar days from the date of receipt of this Notice.

Failure to comply with these conditions within the time specified will entitle Owner to consider your Bid in default, to annul this Notice and to declare your Bid Security forfeited.

The Owner will return to you one (1) fully signed set of the contract documents.

«OwnerCaps»

«OwnerCEOFirst» «OwnerCEOLast», «OwnerCEOTitle»

Date

ACKNOWLEDGMENT

«ContractCAPName»

**DO NOT SIGN THIS PAGE. FOR REFERENCE ONLY. OWNER
WILL SEND SIGNED COPY.**

«ContractFirst» «ContractLast», «ContractTitle»

Date

CONTRACT

FOR «TitleCaps»

THIS CONTRACT, made and entered into at «OwnerCity», «OwnerState», this _____ day of _____, 20____, by and between the «OwnerMuni» (“OWNER”), «OwnerState» and «ContractName» (“CONTRACTOR”).

WITNESSETH: That the said CONTRACTOR has agreed and by this presents does agree with the OWNER for the consideration hereinafter mentioned and contained, and under penalty expressed in a bond given with these presents, and herein contained or hereunto annexed, to furnish at its own cost and expense, all the necessary tools, equipment, materials, labor, and tests in an expeditious, substantial and workmanlike manner, the equipment and appurtenances herein contemplated, commencing work within 20 days from the date of the Notice to Proceed and executing the work within the time and in the manner specified and in conformity with the requirements set forth in this Contract.

The following form essential parts of the Contract (may vary with project).

1. Advertisement for Bids/Public Notice to Bidders
2. Instruction to Bidders
3. Bid Forms and Proposal
4. Contract Forms and Exhibits
5. Contract Bond – ORC 153.571 or ORC 153.57
6. Contract Provisions
7. General Conditions
8. Supplementary Conditions
9. Specifications
10. Specific Project Requirements
11. Prevailing Wage Rate Schedule
12. Contract Drawings; if any.
13. Addenda; if any.

The CONTRACTOR agrees and understands that the work on this contract shall be subject to the acceptance of the OWNER based upon and in accordance with the contract specifications and contract plans and drawings on file in the office of the OWNER.

The CONTRACTOR agrees that each individual employed by the CONTRACTOR or any Subcontractor and engaged in work on the project under this contract shall be paid by prevailing wage established by the Department of Industrial Relations of the State of Ohio or the U.S. Department of Labor (Davis-Bacon Act) as detailed in the section titled "Wage Rates." This shall occur regardless of any contractual relationship which may be said to exist between the Contractor or any Subcontractor and such individual. *(if a School District, delete this paragraph)*

The CONTRACTOR shall proceed with the said work in a prompt and diligent manner and shall do the several parts thereof. Further the CONTRACTOR shall complete the whole of said work in accordance with the specifications and contract drawings to the satisfaction of the OWNER on or before the time stated, and in default of completion within the time as fixed, the CONTRACTOR shall pay to the OWNER as liquidated damages, an amount equal to «Liquidated», for each and every day (Sundays and legal holidays excepted) the completion of the work may be delayed beyond the date fixed in the manner and as stipulated.

It is hereby mutually agreed that the OWNER is to pay and the CONTRACTOR is to receive, as full compensation for furnishing all materials and labor in building, constructing and testing and in all respect completing the herein described work and appurtenances in the manner and under the conditions herein specified, the prices stipulated in the proposal herein contained or hereto annexed and the total contract sum is «ContractDollars».

This Contract shall be in full force and effect from the date of execution by the OWNER and CONTRACTOR.

IN WITNESS WHEREOF: The OWNER and CONTRACTOR hereunto affixed their signature the day and year first mentioned above.

«ContractCAPName»

«ContractFirst» «ContractLast», «ContractTitle»

«OwnerCaps»

«OwnerCEOFirst» «OwnerCEOLast», «OwnerCEOTitle»

I hereby certify that funds in the amount of «ContractAmtwords» Dollars («ContractDollars») necessary for the foregoing Contract have been appropriated and are in the Treasury, or are in the process of collection, or are available through grants and/or loans from other funding sources.

«OwnerFiscalFirst» «OwnerFiscalLast», «OwnerFiscalTitle»

APPROVED AS TO FORM:

«OwnerLegalName», «OwnerLegalTitle»

**THE CONTRACTOR SHALL FURNISH THE FOLLOWING ITEMS
WITHIN 10 DAYS OF NOTIFICATION OF AWARD:**

- A) **CERTIFICATE OF INSURANCE FOR
CONTRACTOR'S PUBLIC LIABILITY INSURANCE POLICY
AND AUTOMOTIVE INSURANCE POLICY**
Owner, Verdantas, LLC & CT Consultants Named as Additional Insured

- B) **CERTIFICATE OF INSURANCE FOR
OWNER'S AND CONTRACTOR'S PROTECTIVE POLICY**
Owner Named as Insured (No Additional Insured)

- C) **CERTIFICATE OF WORKER'S COMPENSATION**

- D) **CONTRACT BOND THAT COMPLIES WITH ORC 153.54 AND 153.57**

* D above is not required if a bond complying with ORC 153.54 and 153.571 (rollover bond) was submitted at time of bid.

DELINQUENT PERSONAL PROPERTY STATEMENT

STATE OF _____)
) SS
COUNTY OF _____)

«ContractName», having been awarded a contract by the «OwnerMuni», «OwnerState», hereby affirms under oath, pursuant to Ohio Revised Code Section 5719.042, that at the time the bid was submitted, my company **was / was not (CIRCLE ONE)** charged with delinquent personal property taxes on the General Tax List of Personal Property for «OwnerCounty» County, Ohio.

If such charge for delinquent personal property tax exists on the General Tax List of Personal Property for «OwnerCounty» County, Ohio, the amount of such due and unpaid delinquent taxes, including due and unpaid penalties and interest shall be set forth below.

A copy of this statement shall be transmitted by the Taxing District's Fiscal Officer to the County Treasurer within thirty days of the date it is submitted. A copy of this statement shall also be incorporated into the Contract made between «OwnerMuni», «OwnerState», and «ContractName», and no payment shall be made with respect to any Contract unless such statement has been so incorporated as a part thereof.

Delinquent Personal Property Tax	\$ _____
Penalties	\$ _____
Interest	\$ _____

«ContractCAPName»

«ContractFirst» «ContractLast», «ContractTitle»

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

Notary Public

My Commission Expires: _____

AFFIDAVIT
OF COMPLIANCE WITH OHIO REVISED CODE SECTION 3517.13

STATE OF _____)
) SS
COUNTY OF _____)

_____ being duly sworn deposes and states as follows:

1. I am duly authorized to make the statements contained herein on behalf of _____ (“the Contracting Party”).
2. The Contracting Party is a/an (select one):
 - ☐ Individual, partnership, or other unincorporated business association (including without limitation, a professional association organized under Ohio Revised Code Chapter 1787), estate, or trust
 - ☐ Corporation organized and existing under the laws of the State of _____
 - ☐ Labor organization
3. I hereby affirm that the Contracting Party and each of the individuals specified in R.C. 3517.13(I) (with respect to non-corporate entities and labor organizations) or R.C. 3517.13(J) (with respect to corporations) are in full compliance with the political contribution limitations set forth in R.C. 3517.13(I) and (J), as applicable.
4. I understand that a false representation on this certification will incur penalties pursuant to 3517.992(R).

Affiant further sayeth naught.

By: _____

Title: _____

SWORN TO BEFORE ME and subscribed in my presence this _____ day of _____, 20_____.

Notary Public

My commission expires: _____

ESCROW AGREEMENT FOR CONTRACTOR'S RETAINAGE

In accordance with a certain Contract between the «OwnerMuni», «OwnerState», (hereinafter referred to as "the Owner") and «ContractName», (hereinafter referred to as "the Contractor"), an Escrow Agent is hereby appointed to hold funds arising out of the Owner's agreement to pay retainage into an escrow fund, said Agent to be:

All retained funds will be placed with the above Escrow Agent from the date your Contract is certified as being 50% complete pursuant to Sections 153.13, and 153.14 and 153.63 Ohio Revised Code.

During the time the aforementioned retained funds are in the custody of the Escrow Agent, the Escrow Agent has authority to invest the escrow funds in the classes of securities listed below which, in the judgment of the Escrow Agent, allow for the least risk to capital preservation and provide for a reasonable income. The income from investment of the escrowed funds shall be accumulated in the escrow account.

- (a) Obligation issued or guaranteed as to interest and principal by the government of the United States, or obligations of the State of Ohio or any political subdivision thereof;
- (b) Obligations including certificates of deposit of any national bank located in this State and/or any bank as defined by Section 1101.01, O.R.C.;
- (c) Repurchase agreements fully secured by obligations of any kind specified in clauses (a) and (b) above; or
- (d) Interest in any money market fund or trust, the investments of which are generally restricted to obligations of any of the kind specified in clauses (a) through (c) above.

The Escrow Agent shall hold the escrowed principal and interest until receipt of notice from the Owner, or until receipt of an Arbitration Order or an Order of the Court of Claims, or other appropriate courts, specifying the amount of the escrowed principal to be released and the person to whom it is to be released. Upon receipt of such a request or order, the Escrow Agent shall, within 30 days, pay such amount of principal and interest earned on the retainage to the Contractor less the Escrow Agent's fee.

It is understood that the Escrow Agent shall have no duties, obligations, or liabilities hereunder other than to hold and invest said funds and to deliver them in accordance with the provisions hereof.

«ContractCAPName»

«ContractFirst» «ContractLast», «ContractTitle»

«OwnerCaps»

«OwnerFiscalFirst» «OwnerFiscalLast», «OwnerFiscalTitle»

ESCROW WAIVER

In accordance with a certain Contract between the «OwnerMuni», «OwnerState», (hereinafter referred to as "the Owner") and «ContractName», (hereinafter referred to as "the Contractor") it is mutually agreed by and between the parties hereto that because of the short-term duration of the within contract, no escrow account will be established pursuant to Sections 153.13, 153.14 and 153.63 of the Ohio Revised Code nor shall any interest be paid on any retainage.

«ContractCAPName»

«ContractFirst» «ContractLast», «ContractTitle»

«OwnerCaps»

«OwnerFiscalFirst» «OwnerFiscalLast», «OwnerFiscalTitle»

NOTICE TO PROCEED

Project: «Title»

Owner: «OwnerMuni»
«OwnerAddr»
«OwnerCity», «OwnerState» «OwnerZip»

To: «ContractName»
«ContractAddr»
«ContractCity», «ContractState» «ContractZip»

Date: _____

You are hereby notified to commence work in accordance with the Contract. All work shall be completed by «Completion_Date».

«OwnerCaps»

«OwnerCEOFirst» «OwnerCEOLast», «OwnerCEOTitle»

**Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Performance Form**

This form is intended to capture the DBE¹ subcontractor's² description of work to be performed and the price of the work submitted to the prime contractor. An EPA Financial Assistance Agreement Recipient must require its prime contractor to have its DBE subcontractors complete this form and include all completed forms in the prime contractors bid or proposal package.

Subcontractor Name		Project Name	
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Prime Contractor Name		Issuing/Funding Entity:	

Contract Item Number	Description of Work Submitted to the Prime Contractor Involving Construction, Services , Equipment or Supplies	Price of Work Submitted to the Prime Contractor
DBE Certified By: <input type="radio"/> ODOT <input type="radio"/> DAS/EDGE <input type="radio"/> Other: _____		Meets/ exceeds EPA certification standards? <input type="radio"/> YES <input type="radio"/> NO <input type="radio"/> Unknown

Check Which One Applies: _____ MBE _____ WBE (Include MBE/WBE Certificates, No DBE Certs)

¹ A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

² Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

FORM 6100-3 (DBE Subcontractor Performance Form)

**Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Performance Form**

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 I.

Prime Contractor Signature	Print Name
Title	Date

Subcontractor Signature	Print Name
Title	Date

**Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Utilization Form**

This form is intended to capture the prime contractor's actual and/or anticipated use of identified certified DBE¹ subcontractors² and the estimated dollar amount of each subcontract. An EPA Financial Assistance Agreement Recipient must require its prime contractors to complete this form and include it in the bid or proposal package. Prime contractors should also maintain a copy of this form on file.

Prime Contractor Name		Project Name	
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Issuing/Funding Entity:			

I have identified potential DBE certified subcontractors	<input type="checkbox"/> YES <input type="checkbox"/> NO		
If yes, please complete the table below. If no, please explain:			
Subcontractor Name/ Company Name	Company Address/ Phone/ Email	Est. Dollar Amt.	Currently DBE Certified?

Continue on back if needed

¹ A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

² Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

**Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Utilization Form**

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 I.

Prime Contractor Signature	Print Name
Title	Date

AMERICAN IRON AND STEEL ACKNOWLEDGEMENT

The Contractor acknowledges to and for the benefit of the _____ (“Purchaser”) and the State of Ohio (the “State”) that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund and/or Drinking Water State Revolving Fund that have statutory requirements commonly known as “American Iron and Steel;” that requires all of the iron and steel products used in the project to be produced in the United States (“American Iron and Steel Requirement”) including iron and steel products provided by the Contractor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the State. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney’s fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Contractor has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

Signature

Date

Name and Title of Authorized Signatory, Please Print or Type

Bidder’s Firm

- ☐ Check here if the WPCLF or WSRLA applicant will be requesting an individual waiver for non-American made iron and steel products. Please note that the waiver box does not need to be marked for nationwide waivers.

THE OWNER OR THEIR AUTHORIZED REPRESENTATIVE SHALL INSERT THE FOLLOWING CONTRACT DOCUMENTATION IN THE EXECUTED CONTRACT:

A) FINDINGS FOR RECOVERY – ORC 9.24
(<http://ffr.ohioauditor.gov/>)

B1) CHECK FOR DEBARRED CONTRACTORS IN THE STATE OF OHIO
(<https://www.sos.state.oh.us/records/debarred-contractors/>)

**B2) CHECK FEDERAL SAM (System for Award Management) for
FEDERAL FUNDING (including sub-contractors), (if applicable)**
(<https://www.sam.gov/SAM/>)

**C) NOTIFICATION OF SURETY AND AGENT OF CONSTRUCTION
CONTRACT AWARD – ORC 9.32 (if applicable)**

**~~D) NOTIFICATION TO UTILITY COMPANIES OF COMMENCEMENT
OF CONTRACT EXECUTION – ORC 153.64 (if applicable)~~**

SECTION 3
GENERAL CONDITIONS

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly by



AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASSOCIATED GENERAL CONTRACTORS OF AMERICA

AMERICAN SOCIETY OF CIVIL ENGINEERS

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE

A Practice Division of the

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

Endorsed by



CONSTRUCTION SPECIFICATIONS INSTITUTE

These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor (EJCDC C-520 or C-525, 2007 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the Narrative Guide to the EJCDC Construction Documents (EJCDC C-001, 2007 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (EJCDC C-800, 2007 Edition).

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
 3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
 5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 6. *Bidder*—The individual or entity who submits a Bid directly to Owner.
 7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
 8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
 9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
 10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
 11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.
15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.
16. *Cost of the Work*—See Paragraph 11.01 for definition.
17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
19. *Engineer*—The individual or entity named as such in the Agreement.
20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
21. *General Requirements*—Sections of Division 1 of the Specifications.
22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
30. *PCBs*—Polychlorinated biphenyls.
31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.
46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an

addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 Terminology

A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day:*

1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective:*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide:*

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of

the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

- A. Standards, Specifications, Codes, Laws, and Regulations
 1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

- A. *Reporting Discrepancies:*

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.
2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. Resolving Discrepancies:

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
 - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 Amending and Supplementing Contract Documents

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:
 1. A Field Order;
 2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or

3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

- A. Contractor and any Subcontractor or Supplier shall not:
 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or
 2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the

Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

- 1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
- 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors 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.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

- 1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
- 2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

- B. *Engineer's Review:* After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and
 - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
 - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other

professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and
2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all such information and data;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents;
 - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
 - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price

or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors 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.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by

Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.

- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.
- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.
- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
 - 2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
 - 3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
 - 4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:
 - a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
 - b. by any other person for any other reason;
 - 5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
 - 6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
- B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
6. include completed operations coverage:
 - a. Such insurance shall remain in effect for two years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;
 2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.
 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
 4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
 5. allow for partial utilization of the Work by Owner;
 6. include testing and startup; and
 7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.
- B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.
- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property

insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

- E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:
 - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery

against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

- A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR’S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner’s written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.
- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.
1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.
1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and
 - 3) it has a proven record of performance and availability of responsive service.
 - b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items:*

- a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
- b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
- c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.
- d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - 1) shall certify that the proposed substitute item will:
 - a) perform adequately the functions and achieve the results called for by the general design,
 - b) be similar in substance to that specified, and
 - c) be suited to the same use as that specified;
 - 2) will state:
 - a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,
 - b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
 - c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
 - 3) will identify:
 - a) all variations of the proposed substitute item from that specified, and
 - b) available engineering, sales, maintenance, repair, and replacement services; and

- 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.
- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or

other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor
 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all

court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.
2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor

shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

- D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
1. all persons on the Site or who may be affected by the Work;
 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

- A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*
 - a. Submit number of copies specified in the General Requirements.
 - b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.
 2. *Samples:*
 - a. Submit number of Samples specified in the Specifications.
 - b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.
- B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Submittal Procedures:*
1. Before submitting each Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
 2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.
 3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop

Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. Engineer's Review:

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. Resubmittal Procedures:

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

- A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
1. observations by Engineer;
 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 4. use or occupancy of the Work or any part thereof by Owner;
 5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;
 6. any inspection, test, or approval by others; or
 7. any correction of defective Work by Owner.

6.20 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor,

Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 *Related Work at Site*

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
 - 1. written notice thereof will be given to Contractor prior to starting any such other work; and
 - 2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.
- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:
 - 1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
 - 2. the specific matters to be covered by such authority and responsibility will be itemized; and
 - 3. the extent of such authority and responsibilities will be provided.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.
- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

- A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

- A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

- A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

9.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits

and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

- A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
 2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
 3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The

opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
1. deny the Claim in whole or in part;
 2. approve the Claim; or
 3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.
- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on

Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

- D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances:*

1. Contractor agrees that:

- a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
- b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance:*

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

- D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:
1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 2. there is no corresponding adjustment with respect to any other item of Work; and
 3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
 2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
 3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).
- C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

- c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
- d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
- e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
- f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the

control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

- A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
 - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
 - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and
 - 3. as otherwise specifically provided in the Contract Documents.

- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.
- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.
- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.
- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).
- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. repair such defective land or areas; or
 - 2. correct such defective Work; or
 - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute

resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and

equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

- A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments:*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the

Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. Review of Applications:

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or

- b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
 - d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due:

- 1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. Reduction in Payment:

- 1. Owner may refuse to make payment of the full amount recommended by Engineer because:
 - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
 - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - c. there are other items entitling Owner to a set-off against the amount recommended; or

- d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.
3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities

pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 - 1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.
 - 2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
 - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. Application for Payment:

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;
 - b. consent of the surety, if any, to final payment;
 - c. a list of all Claims against Owner that Contractor believes are unsettled; and
 - d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. Engineer's Review of Application and Acceptance:

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due:

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

- A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
 1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
 2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
 2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
 3. Contractor's repeated disregard of the authority of Engineer; or
 4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);
 2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and
 3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
 3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
 4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 *Methods and Procedures*

- A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.
- B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.
- C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:
 - 1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or
 - 2. agrees with the other party to submit the Claim to another dispute resolution process; or
 - 3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
 - 1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
 - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

- A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC C-700, 2007 ed.) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented herein or in the Specific Project Requirements remain in full force and effect.

SC-1.01 The terms used in these Supplementary Conditions which are defined in the General Conditions have the meaning assigned to them in the General Conditions.

SC-2.02 Delete paragraph 2.02(A) in its entirety and insert the following in its place:

Owner shall furnish one (1) printed/hard copy of the drawings and Project Manual which shall be an executed contract set and one set in electronic format (.pdf), if requested.

SC-2.03(A) In the last sentence of 2.03A, change "sixtieth day" to "one hundred fiftieth day."

SC-2.03 (B) By submission of a bid, the bidder hereby grants consent that the award and execution period shall be extended from sixty days to one hundred twenty days after the date on which the bids are opened.

SC-4.02(A) Change "Supplementary Conditions" to read "Specific Project Requirements."

SC-4.06(G) Delete paragraph 4.06(G) in its entirety.

SC-5.03(A)(1) The required Certificate of Insurance shall be in a form satisfactory to the Owner (most current version of ACORD 25 or approved equal). If the Contractor fails to procure and maintain any specified and/or required insurance, the Owner shall have the right to procure and maintain the said insurance for and in the name of the Contractor and the Contractor shall pay the cost thereof and shall furnish all necessary information to make effective and maintain such insurance.

SC-5.04(B)(1) Change "Supplementary Conditions" to read "Specific Project Requirements."

SC-5.04(B)(2) The limits of liability for the insurance required by paragraph 5.04(A) of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

All of the limits below may be satisfied with an Umbrella/Excess Liability as needed to increase the Primary Policy to required limits.

5.04(A)(1) and (2) Workers' Compensation, etc., under paragraphs 5.04(A)(1) and 5.04(A)(2) of the General Conditions:

- | | |
|--|-------------|
| (a) State | Statutory |
| (b) Applicable Federal (e.g., Longshoreman's): | Statutory |
| (c) Employer's Liability: | \$1,000,000 |

5.04(A)(3), (4) and (5). Contractor's Liability Insurance under paragraphs 5.04(A)(3) through 5.04(A)(5) of the General Conditions which shall also include completed operations and product liability coverage.

- (a) Bodily Injury and Property Damage, Combined Single Limit (CSL) (Except Products and Completed Operations) Property Damage liability insurance will provide Explosion, Collapse, and Underground coverage where applicable.

Each Occurrence	\$2,000,000
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General Aggregate	\$4,000,000
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- (b) Products and Completed Operations Aggregate \$1,000,000

Products and Completed Operations to be maintained for two (2) years after final payment and Contractor shall continue to provide evidence of such coverage to the Owner on an annual basis during the aforementioned period.

- (c) Personal and Advertising Injury (Per Person/Organization and per occurrence). \$1,000,000

- (d) Fire Damage \$100,000

- (e) If the General Liability Policy includes a General Aggregate, such policy shall be endorsed to have the General Aggregate Per Project Aggregate Limit.

5.04(A)(6) Automobile Liability - (Owned, Non-Owned, Hired)
Contractor may provide split limits or combined single limit.

- (a) Split Limits:

Bodily Injury,	Each Person:	\$2,000,000
	Each Occurrence	\$2,000,000

Property Damage,	Each Occurrence	\$1,000,000
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or

- (b) Combined Single Limit

Bodily Injury and Property Damage,	
Each Occurrence	\$2,000,000

SC-5.04(B)(3) Add the following to the end of the paragraph: “to the extent available in the insurance industry with industry standard exclusions and as allowed under the laws and regulations in the State of Ohio;”

SC-5.04(B)(4) Add the following:

Written notice of cancellation for non-payment of premium shall be at least 10 days.

Add the following section:

SC-5.04(C) Unless otherwise stated in Specific Project Requirements, the Contractor shall purchase and provide an "Owner's and Contractor's Protective Policy" with an immediate Effective Date and the Owner listed as the insured (No additional insureds) for the following limits:

Each Occurrence	\$1,000,000
General Aggregate	\$2,000,000

Add the following section:

SC-5.04(D) Unless otherwise stated in Specific Project Requirements the Contractor shall purchase and maintain during the Contract Time "All Risk Builders' Risk Insurance," and/or "Installation Floater Insurance," and/or "Boiler and Machinery Insurance," and any and all insurance requirements of section GC-5.06 of the General Conditions as applicable for the type of work to be performed upon the Project to the full insurable value thereof for the benefit of the Owner, the Contractor, Subcontractors and Suppliers as their interest may appear. This insurance shall cover the work until final acceptance and final payment by the Owner. This provision shall in no way release the Contractor or Contractor's Surety from obligations under the Contract Documents to fully complete the Project. The original policy(s) shall be filed with the Owner or his designated representative.

SC-5.05 *Owner's Liability Insurance*

See SC-5.04(C) above.

SC-5.06 *Property Insurance*

Unless otherwise stated in Specific Project Requirements, the Contractor, not the Owner, shall purchase and maintain during the Contract Time all property insurance required in section GC-5.06 of the General Conditions and as outlined in SC-5.04(D) above.

Add the following section:

SC-6.02(C) The Contractor shall be responsible for the Owner and/or Engineer's additional inspection and administrative costs for work performed beyond regular working hours as defined in this Section.

SC-6.07(B) Delete paragraph 6.07(B) in its entirety.

SC-6.09 (D) Add the following:

D. The contractor agrees to the requirements of RC 153.59, RC 153.591, and RC 153.60.

Add the following section:

SC-6.10(B) Add the following:

Should the Owner be exempt from Ohio State Sales and Use Taxes on materials and equipment to be incorporated in the Project, the Contractor may obtain a waiver and said taxes shall not be included in the Contract Price.

1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of supplies and materials to be incorporated into the work
2. Owner's exemption to Contractor does not apply to construction tools, machinery, equipment, or other property by or leased by Contractor, or to supplies or materials not incorporated into the work.

The Contractor shall withhold and/or pay all consumer, use, property, employment, income and other taxes in accordance with the laws and regulations of the United States, State of Ohio, Owner and other applicable agencies which are applicable during the performance of the work.

SC-6.17 *Shop Drawings and Samples*

Add the following new paragraphs immediately after paragraph 6.17(E):

- F. Contractor shall furnish required submittals with sufficient information and accuracy in order to obtain required approval of an item with no more than three (3) submittals. Engineer will record Engineer's time for reviewing subsequent materials of shop drawings, samples, or other items requiring approval and Contractor shall reimburse Owner for Engineer's charges for such time.
- G. In the event that Contractor requests a substitution for a previously approved item, Contractor shall reimburse Owner for Engineer's charges for such time unless the need for such substitution is beyond the control of the Contractor.

SC-7.02 Delete Section 7.02 of the General Conditions in its entirety and insert the following:

SC-7.02(A) The General Construction Contractor shall be referred to and defined as the Construction Coordinator.

SC-7.02(B) Duties of the Construction Coordinator include the following:

1. Scheduling and coordinating the work of the Prime Contractors including submission and periodic updating of project schedule.
2. Establishing and administrating the site safety program and procedures for the project.
3. See that permits are applied for and obtained on a timely basis. Advise the Engineer of any problems related to permit approval.
4. Monitoring compliance with Laws and Regulations.
5. Maintain project site for dust, sedimentation, debris, waste, and general site cleanliness.
6. Coordinate location and use of temporary construction facilities including but not limited to sanitary, water, power, telephone, and parking.
7. Coordinate Owner interface for utility tie-ins/shut downs.
8. Monitor shop drawing submittal and coordination of submittal information between Prime Contractors.

SC-10.01 (A) Add the following:
The Owner may request from the Contractor and the Contractor shall provide within ten days of the request, a quote for all ordered changes in the work or work the Owner may be considering to be ordered. The quote shall be a line item, detailed, itemized breakdown of the work.

SC-11.01(A) For purposes of "Cost of the Work" delete Section 11.01(A), (B), and (C) of the General Conditions in their entirety and insert ODOT 109.05, in its place.

SC-13.07(A) In the First sentence of Section 13.07(A) remove "Substantial Completion" and insert "Final Acceptance of the entire project and final payment by the Owner."

SC-13.07(C) Remove 13.07(C) and replace with the following:

All materials and equipment shall be warranted by the respective material supplier or equipment manufacturer until the end of the Contractor's "correction period" (or longer if specified elsewhere in the contract) regardless of date of initial installation or operation of the material or equipment. The cost of such extended warranties as needed from material suppliers or equipment manufacturers to provide warranty coverage until the end of the "correction period" or other period as specified in the contract shall be the responsibility of the prime contractor and shall be assumed to have been included in his bid.

SC-14.02(A) (3) Delete Section 14.02(A) (3) of the General Conditions in its entirety and insert the following:

Until the job is 50% complete, the Contractor will be paid 92% of the estimated value of labor and material completed in acceptable form. After the work is 50% complete, no further funds shall be retained and the Contractor shall be paid 100% of the estimated value of the remaining labor and material completed in acceptable form, provided that the Contractor is making satisfactory progress and there is no specific cause for greater withholding. Upon the Owner's agreement that the project is substantially complete, the Retainage may be reduced to twice the value of the remaining punch list work subject to the recommendation of the Engineer and the approval by the Owner.

Add the following section:

SC-14.02(A) (4)

Payment for stored materials at invoice prices or at the unit price bid for materials, or the lesser value of the two, will be made for accepted nonperishable equipment and materials which are to be incorporated into the work, when accepted, delivered, properly stored, and protected upon the site and verified to the Engineer by a copy of the invoice. For materials and equipment meeting the foregoing conditions, the Owner will pay, when properly included in an approved estimate, 92% of the invoice value of the same. Subsequent to the inclusion of a payment for delivered materials in a progress payment, Contractor shall submit no later than the next payment submission, a partial waiver of lien from each and every supplier for whom delivered materials were paid. If no such waiver is submitted prior to or along with the next payment, the amount of delivered materials paid commensurate with that particular item will be deducted from future payments. No payment for delivered materials shall be made for any items that are scheduled to be incorporated in the work within 30 days of submission of the pay estimate. Delivered materials will not be paid in any given month for a total amount less than \$5,000.00. Payment for delivered materials for such items as pipe backfill and roadway subbase will not be routinely considered.

SC-16.01 Delete Article 16 in its entirety and replace with the following:

10/17

ARTICLE 16 - DISPUTE RESOLUTION AGREEMENT - JUDICIAL SYSTEM

OWNER and CONTRACTOR hereby agree that Article 16 of the General Conditions to the Agreement between OWNER and CONTRACTOR is amended to include the following agreement of the parties:

- 16.01 All claims, disputes and other matters in question between Owner and Contractor arising out of or relating to the Contract Documents or the breach thereof (except for claims which have been waived by the making or acceptance of final payment as provided by Paragraph 14.09) will be decided through the Cuyahoga County Court of Common Pleas. Arbitration will be entered into only if agreed upon in writing by both parties.
- 16.02 OWNER and CONTRACTOR agree that they shall first submit any and all unsettled claim, counterclaims, disputes and other matters in question between them arising out of or relating to the Contract Documents or the breach thereof ("disputes"), to mediation by the American Arbitration Association under the Construction Industry Mediation Rules of the American Arbitration Association prior to either of them initiating suit against the other.

END OF SECTION

01/2024

SECTION 5
SPECIFICATIONS

SECTION 011000 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Project description.
3. Work sequence.
4. Work restrictions.
5. Permits.
6. Specification conventions.
7. Drawing Schedule

B. Related Requirements:

1. Section 012513 – Product Substitution Procedures
2. Section 013216 - Construction Progress Schedule: Digital project management procedures and web-based project management software package.

1.2 PROJECT INFORMATION

A. Name: City of Richmond Heights IIJA Sanitary Sewer Improvements

1. Project Locations:
 - a. Improvement Section 1: 688 Radford Drive, Richmond Heights, OH 44143
 - b. Improvement Section 2: 5232 Marrus Lane, Richmond Heights, OH 44143
 - c. Improvement Section 3: 533 Richmond Road, Richmond Heights, OH 44143

B. Owner: City of Richmond Heights, Ohio

1. Owner's Representative:
Ryan Tiedman, Service Director
Ryan.tiedman@richmondheightsohio.org

C. Engineer: CT Consultants, Inc., A Verdantas Company

1. Engineer's Representative:
Tim McLaughlin, P.E
440.530.2352

- D. The Project consist of a Base Bid with two (2) alternates for the Contractor to bid on. The Base Bid will be awarded with at least one (1) of the alternates. The Contractor is required to submit a bid on at least one alternate as part of their bid package.

1.3 PROJECT DESCRIPTION

- A. **BASE BID:** The base bid is classified into three (3) groups of improvements detailed below:
1. Improvement 1: Installation of 8" sanitary sewer between an existing manhole located on Radford Lane to the terminus upstream sanitary manhole located on Meadowlane Drive. Work shall include, but not limited to, coring and installation of connections to existing manholes, installation of new sanitary sewer, the replacement of pavement, curb, and/or curb ramp associated with trench disturbance, maintenance of traffic in accordance ODOT Item 614, and restoration of surfaces, landscaping, and/or features that are disturbed or damaged due to the storage of materials or construction activity.
 2. Improvement 2: Installation of 8" sanitary sewer between an existing manhole located on Edgewood Road to a new manhole to be installed by the Contractor on the existing 8" PVC sewer on Marrus Lane. The existing sewer from Radford Lane to Edgewood Road improvements shall be determined based upon the two alternatives. Work shall include, but not limited to, coring and installation of connection to existing manhole, installation of new sanitary sewer and 48" precast concrete manholes, replacement of pavement, curb, walk, and/or curb ramp associated with trench disturbance, maintenance of traffic in accordance ODOT Item 614, abandonment of existing sewers, and restoration of surfaces, landscaping, and/or features that are disturbed or damaged due to the storage of materials or construction activity.
 3. Improvement 3: Installation of a drop structure in the Access Manhole HIE00010 to convey flow from proposed gravity sewer extension for Belle Oakes Development. Improvements include the 12" sanitary sewer extension between the existing terminus manhole located on the Belle Oakes development to the access manhole. Work shall include, but not limited to, coring and installation of connection to existing manholes, installation of new sanitary sewer and 48" precast concrete manholes, pavement, curb, walk, and/or curb ramp replacement associated with trench disturbance, installation of drop structure, maintenance of traffic in accordance ODOT Item 614, and restoration of surfaces, landscaping, and/or features that are disturbed or damaged due to the storage of materials or construction activity.
- B. **ALTERNATE A:** Edgewood & Radford - Improvements shall be the removal and replacement of the 8" sanitary sewer between manhole SA46JCAC0 on Edgewood Road to proposed manhole and the abandonment of the remaining 8" sewer in place that extends to Radford Drive. Work shall include, but not be limited to, coring and installation of connection to existing manholes, installation of new sanitary sewer and 48" precast concrete manholes, pavement and curb replacement associated with trench disturbance, reconnections of existing laterals into new redirect sewer, maintenance of

traffic in accordance ODOT Item 614, and restoration of surfaces, landscaping, and/or features that are disturbed or damaged due to the storage of materials or construction activity.

- C. ALTERNATE B: Edgewood & Radford - Improvements shall be the abandonment in place of the 8" sanitary sewer between manhole SA46JCAC0 on Edgewood Road to proposed manhole, and the remaining 8" sanitary sewer to receive CIPP lining or point repairs. In addition, the existing 8" exterior drop structure manhole is to be removed and replaced in kind. Work shall include, but not be limited to, coring and installation of connection to existing manholes, installation of CIPP lining in existing sanitary sewer and 48" precast concrete manholes, pavement replacement associated with trench disturbance, heavy cleaning and point repairs of existing sanitary sewer, reconnections of existing laterals into new redirect sewer, maintenance of traffic in accordance ODOT Item 614, and restoration of surfaces, landscaping, and/or features that are disturbed or damaged due to the storage of materials or construction activity.
- D. All improvements are to paid for through pay items broken down by unit prices. Method of measurement and basis of payment for all items is described in bid document "Prices to Include".

1.4 WORK SEQUENCE

- A. Construct Work in order to accommodate Owner's occupancy requirements during construction period. Coordinate construction schedule and operations with Engineer:
- B. Sequencing of Construction Plan: Contractor shall provide a detailed construction progress schedule in accordance with section 013216 – Construction Progress Schedule.

1.5 WORK RESTRICTIONS

- A. Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction (AHJ).
- B. On-Site Work Hours: Limit Work to between 7:00 a.m. to 7:00 p.m., Monday through Friday, unless otherwise indicated. Work hours may be modified to meet Project requirements if approved by Owner and AHJ.
- C. On-Site Work Day Restrictions: Do not perform Work resulting in utility shutdowns on Site during Work blackout days indicated by Owner.
- D. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions, and only after arranging for temporary utility services according to requirements indicated:

1. Notify Owner or Engineer not less than 48 hours in advance of proposed utility interruptions.
 2. Obtain Owner of the subject utility's written permission before proceeding with utility interruptions.
- E. Noise, Vibration, Dust, and Odors: Coordinate with Owner operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy.
1. Notify Owner or Engineer not less than 48 hours in advance of proposed utility interruptions.
 2. Obtain Owner's written permission before proceeding with utility interruptions.

1.6 PERMITS

- A. Furnish necessary permits for construction of Work, including the following:
1. Building permit.

1.7 SPECIFICATION CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
 3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
- B. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.
 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

END OF SECTION 011000

SECTION 011419 – USE OF SITE

PART 1 - GENERAL

1.1 GENERAL

- A. The Contractor will be allowed the use of as much of the site designated for the improvements as is necessary for his operation.

1.2 USE OF STREETS

- A. During the progress of the work, the Contractor shall make ample provisions for both vehicle and pedestrian traffic on any public street and shall indemnify and save harmless the Owner from any expense whatsoever due to their operations over said streets. The Contractor shall also provide free access to all the fire hydrants, water, and gas valves located along the line of his work. Gutters and waterways must be kept open or other provisions made for the removal of storm water. Street intersections may be blocked only one-half at a time, and the Contractor shall lay and maintain temporary driveways, bridges and crossings, such as in the opinion of the Engineer are necessary to reasonably accommodate the public.
- B. In the event of the Contractor's failure to comply with these provisions, the Owner may cause the same to be done, and may deduct the cost of such work from any monies due the Contractor under this Agreement, but the performance of such work by the Owner at its instance shall serve in no way to release the Contractor from his general or particular liability for the safety of the public or the work.
- C. The Contractor shall repair at no cost to the Owner, all existing roads, parking areas, grassed areas that are damaged due to the execution of his work. The Contractor shall remove daily all mud, soil and debris that may be tracked onto existing streets, drives, or walks by his equipment or that of subcontractors or suppliers.

1.3 CLOSING STREETS TO TRAFFIC

- A. The Contractor may with the approval of the Engineer, close streets, or parts of streets, to vehicular traffic on Radford Road, Meadowlane Drive, Marrus Lane, or Edgewood Drive. The streets are to remain closed as long as the construction work or the condition of the finished work requires or as determined by the Engineer. The Engineer shall be the judge of how many streets or parts of streets it is necessary for the Contractor to close at any time and may refuse to permit the closing of additional streets to traffic until the majority of the work on the closed streets is completed and they are opened to traffic.

1.4 RIGHTS-OF-WAY

- A. Whenever it is required to perform work within the limits of public or private property or in rights-of-way, such work shall be done in conformity with all agreements between the Owner and the owners of such. Care shall be taken to avoid injury to the premises

entered, which premises shall be left in a neat and orderly condition by the removal of rubbish and the grading of surplus materials, and the restoration of said public or private property to the same general conditions as pertained at the time of entry for work to be performed under this contract.

- B. The Contractor shall not (except after consent from the proper parties) enter or occupy with men, tools or equipment, any land outside the rights-of-way or property of the Owner.
- C. When the Contractor performs construction within 10 ft. of a right-of-way or easement line, he shall place tall stakes properly identified at points of change in width or direction of the right-of-way or easement line and at points along the line so that at least two stakes can be seen distinctly from any point on the line.

1.5 EASEMENTS

- A. Where the work is to be constructed upon easements, such easements will be secured by the Owner without cost to the Contractor. The Contractor shall not enter upon or occupy any private property outside of the limits of the easements furnished.
- B. Care shall be taken to avoid injury to the premises entered, which premises shall be left in a neat and orderly condition by the removal of rubbish and the grading of surplus materials, and the restoration of said public or private property to the same general conditions as pertained at the time of entry for work to be performed under this contract.

1.6 PROTECTING EXISTING BUILDINGS, STRUCTURES AND ROADWAYS

- A. The Contractor shall, at his own expense, shore up and protect any buildings, roadways, utilities or other public or private structures which may be encountered or endangered in the prosecution of the work, and that may not be otherwise provided for, and he shall repair and make good any damages caused to any such property by reason of his operations. All existing fences removed due to the prosecution of the work shall be replaced by the Contractor. No extra payment will be made for said work or material, but the cost of this work must be included in the price stipulated for the work to be done under this contract.

1.7 SITE FACILITIES

- A. The Contractor shall furnish and place sufficient quantities of portable toilet facilities at locations convenient for use by the Contractor's personnel, Subcontractors, the Engineer, and the Owner.

1.8 RESTORATION

- A. The contractor shall restore all areas per the plans and specifications and if not specified, at least to the condition existing prior to the start of work.

END OF SECTION 011419

SECTION 012513 – PRODUCT SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 MATERIALS AND EQUIPMENT

- A. In the specifications and on the Engineer's drawings, are specified and shown certain pieces of equipment and materials deemed most suitable for the service anticipated. This is not done to eliminate other equipment and materials equally as good and efficient. The Contractor shall prepare their bid on the particular materials and equipment specified. Following the award of the contract, should the Contractor desire to use other equipment and materials, they shall submit to the Owner a written request for such change and state the advantage to the Owner and the savings or additional cost involved by the proposed substitution. The determination as to whether or not such change will be permitted rests with the Owner and the Engineer.
- B. Each major item of equipment shall be inspected by a manufacturer's representative during installation and upon completion of the work. The Contractor shall supply the Engineer with a certificate of such inspection.

END OF SECTION 012513

SECTION 013119 - PROJECT MEETINGS

PART 1 - GENERAL

1.1 PRECONSTRUCTION MEETING

- A. Prior to the Contractor beginning any work on the project, the Owner will schedule and hold a preconstruction meeting to discuss all aspects of the contract work.
- B. The Contractor shall be present and be prepared to comment in detail on all aspects of his work.
- C. The Contractor shall bring to the preconstruction meeting a proposed construction progress schedule, erosion control plan, quality control program, concrete mix designs, asphalt mix designs (JMF), etc. Approval of each by the Engineer is required prior to the start of any work.
- D. Included in the construction progress schedule shall be an implementation sequence of the proposed erosion control efforts required by the contract.

1.2 PROGRESS MEETINGS

- A. Monthly progress meetings will be held at a location to be determined by the Owner on a regularly scheduled day mutually convenient to the Owner, Contractor, and Engineer.
- B. The Contractor shall provide an updated construction progress schedule and be prepared to comment in detail on all aspects of his work.

END OF SECTION 013119

SECTION 013216 – CONSTRUCTION PROGRESS SCHEDULE

PART 1 - GENERAL

1.1 PROGRESS SCHEDULE

- A. Immediately after signing the Contract, the General Construction Contractor shall prepare a graphic progress schedule, indicating the work to be executed during each month and the rate of expected progress to secure completion on the agreed-upon completion date. The progress schedule shall be approved by the Engineer and Owner prior to starting work on the site. Copies of such graphic progress charts, upon which has been indicated the actual progress, shall be furnished to the Engineer with each requisition for payment.
- B. Should the rate of progress fall materially behind the scheduled rate of progress, and unless the delay is authorized by the Engineer, each offending Contractor shall furnish additional labor, work overtime, or take other necessary means required for completion of the work on the scheduled date. No additional compensation beyond the set Contract price shall be paid for action taken or overtime expense incurred in maintaining scheduled progress.

END OF SECTION 013216

SECTION 013223 – SURVEY AND LAYOUT DATA

PART 1 - GENERAL

1.1 STAKING

- A. The Contractor shall hire a surveyor licensed in the State of Ohio who is to be installed to provide all reference points not already established and staking. The Contractor shall protect and preserve the established staking and reference points as long as required for installation of the work and field verifications by any party. The Contractor's surveyor shall replace and accurately relocate all staking and reference points so lost, destroyed or moved.

1.2 LAYOUT OF WORK

- A. The Contractor shall lay out their work and be responsible for correct locations, elevations and dimensions of all work executed by them under this Contract. The Contractor must exercise proper precautions to verify the figures shown on the Drawings before laying out the work and will be held responsible for any error resulting from his failure to exercise such precaution. The Contractor shall insure the new construction aligns with any existing work.

END OF SECTION 013223

SECTION 013233 – PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 PROGRESS PHOTOGRAPHS

- A. The General Construction Contractor shall have two (2) color photographs made of the project every three (3) weeks it is in progress. The photographs shall be of such views and taken at such times as the Engineer directs.
- B. All photographed work shall be done by a qualified, established, commercial photographer. Two (2) glossy prints of each photograph shall be furnished the Engineer and two (2) to the Owner. Prints shall be approximately 7-1/2 in. X 10 in. in size. Prints shall be inserted in transparent sheet protectors provided with punching for a 3-ring binder. Suitable binders shall be provided by the Contractor.
- C. Each photograph shall have a permanent negative title block in the lower right hand corner or on the back, approximately 2-1/4 in. wide x 1-3/4 in. high, and stating therein in neat lettering:
 - 1. Owner's Name
 - 2. Contract Description
 - 3. Contractor's Name
 - 4. Description of View
 - 5. Photo No._____, Date_____
 - 6. Consulting Engineer
- D. The arrangement of and the information in the title block, shall be subject to the Engineer's approval. The cost for all photographs shall be paid for by the General Construction Contractor.

END OF SECTION 013233

SECTION 013236 – VIDEO MONITORING AND DOCUMENTATION

PART 1 - GENERAL

1.1 SCOPE

- A. Provide all labor, materials, equipment, and services, and perform all operations necessary to furnish to the Owner a complete color audio-video record on a USB Flash Drive of the surface features within the proposed construction zone of influence. This record shall include, but not be limited to, all audio-video USB Flash Drives, storage cases, video logs, and indexes. The purpose of this coverage shall be to accurately document the pre-construction condition of these surface features.

1.2 QUALIFICATIONS

- A. The color audio-video documentation shall be done by a responsible commercial firm known to be skilled and regularly engaged in the business of pre-construction color audio-video documentation. The firm shall furnish such information as the Owner deems necessary to determine the ability of that firm to perform the work in accordance with the Contract specifications.

1.3 PRODUCTS

- A. The color audio-video recording delivered to the Owner shall be on a high quality USB flash drive in mp4 format.

END OF SECTION 013236

SECTION 013319 - FIELD TEST REPORTING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes, but is not limited to, services performed by an independent testing laboratory. Laboratory services covered under this section are for testing materials used for field constructed elements of the work. Performance testing of manufactured items and shop fabricated materials shall be covered under their respective specification section.
- B. All testing performed under this item shall be for the protection and benefit of the Owner and shall not be construed by the Contractor as a comprehensive quality control program intended to protect the Contractor, his subcontractors, or his suppliers. The testing frequency and types of testing shall be at the discretion of the Owner.
- C. Inspections, tests, and related actions specified in this section and elsewhere in the contract documents are not intended to limit the Contractor's own quality control procedures and testing, which facilitate overall compliance with requirements of the contract documents. Requirements for the Contractor to provide quality control services as required by the Engineer, the Owner, governing authorities, or other authorized entities are not limited by the provisions of this Section.
- D. The Contractor is required to cooperate with the independent testing laboratories performing required inspections, test, and similar services and the Engineer or his representative.
- E. Materials and installed work may require testing or retesting at any time during progress of work. Retesting of rejected materials or installed work shall be done at Contractor's expense.

1.2 RELATED DOCUMENTS AND SECTIONS

- A. Drawings and general provisions of the Contract, including General Supplementary Conditions and Division 1 Specifications sections, apply to work of this section.
- B. The Contract Documents may include testing requirements furnished under other Sections. Work elements which may include other testing requirements are:
 - 1. Section 310000 - Earthwork
 - 2. Section 321000 – Pavement Replacement
 - 3. Section 331000 – Sanitary Sewer System
 - 4. Cuyahoga County Department of Public Works “Uniform Standards for Sewage Improvements” dated 2019.

1.2 SELECTION AND PAYMENT

- A. The Contractor will employ an independent testing laboratory to perform specified testing. Payment shall be incidental to the related work bid item. The laboratory shall be mutually agreed upon by the Owner, Engineer, and Contractor.
- B. Employment of testing laboratory in no way relieves the Contractor of the obligation to perform work in accordance with requirements of the contract documents.

- C. The testing laboratory and their personnel shall be under the direction of the Engineer's on-site representative, regardless of who employs their services.

1.4 REFERENCES

- A. AASHTO T-19, Standard Method of Test for Unit Weight and Voids in Aggregate.
- B. AASHTO T-37, Standard Method of Test for Sieve Analysis of mineral Filler for Road and Paving Materials.
- C. AASHTO T-230, Standard Method of Test for Determining Degree of Pavement Compaction of Bituminous Aggregate Mixtures.
- D. ASTM C-29, Standard Method of Test for Unit Weight and Voids in Aggregate.
- E. ASTM C-31, Standard Practice for Making and Curing Concrete Test Specimens in the Field.
- F. ASTM C-33, Standard Specification for Concrete Aggregates.
- G. ASTM C-39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- H. ASTM C-40, Test Method for Organic Impurities in Fine Aggregates for Concrete.
- I. ASTM C-42, Standard Test Methods for Obtaining and Testing Drilled Cored and Sawed Beams of Concrete.
- J. ASTM C-88, Standard Test Method for Soundness of Aggregate by use of Sodium Sulfate or Magnesium Sulfate.
- K. ASTM C-94, Standard Specification for Ready-Mixed Concrete.
- L. ASTM C-117, Standard Test Method for Materials Finer than 75-um (No. 200) Sieve in Mineral Aggregates by Washing.
- M. ASTM C-136, Standard Method for Sieve Analysis of Fine and Course Aggregate.
- N. ASTM C-142, Test Method for Clay Lumps and Friable Particles in Aggregate.
- O. ASTM C-143, Standard Test Method for Slump of Hydraulic Cement Concrete.
- P. ASTM C-172, Standard Practice for Sampling Freshly Mixed Concrete.
- Q. ASTM C-173, Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
- R. ASTM C-231, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
- S. ASTM C-535, Standard Test Method for Resistance to Degradation of Large-Size Course Aggregate by Abrasion and Impact in the Los Angeles Machine.

- T. ASTM C-969, Standard practice for infiltration and exfiltration acceptance of installed concrete sewer pipe
- U. ASTM C-1064, Standard Test Method for Temperature of Freshly Mixed Portland Cement Concrete.
- V. ASTM C-1244, Standard Test Method for Concrete Sewer Manholes by Negative Air Pressure (Vacuum) Test Prior to Backfill
- W. ASTM D-698, Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5-lb. (2.49-kg) Rammer and 12-inc. (305-mm) Drop.
- X. ASTM D-2487, Standard Test Method for Classification of Soils for engineer purposes.
- Y. ASTM D-2940, Standard Specification for Graded Aggregate Material for Bases or Subbases for Highways or Airports.
- Z. ASTM D-4253, Standard Test Method for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
- AA. ASTM D-4254, Standard Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
- AB. ASTM D-4832, Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders.
- AC. ODOT Supplement 1021, Method of Test for Determination of the Percent of Fractured Pieces in Gravel.
- AD. ODOT Supplement 1029, Method of Test for Determining the Percentage of Deleterious Materials in Course Aggregate.
- AE. ODOT Supplement 1036, Method of Test for Determination of Percent Air Voids in Compacted Dense Bituminous Paving Mixtures.
- AF. ODOT Supplement 1044, Mix Design Method for Bituminous Aggregate Base.
- AG. Uni-Bell PVC Pipe Association UNI-B-6-98 for Low Pressure Air Testing of Installed Sewer Pipe.

1.5 SUBMITTALS

- A. Prior to the start of work, submit testing laboratory name, address, and telephone number, and names of full-time specialist and responsible officer.
- B. Submit copy of the testing laboratory's evaluation report issued by one of the evaluation authorities identified in Article 1.6 of this Section with memorandum of remedies of any deficiencies reported by the inspection.
- C. Submit the chain of custody and other QA/QC procedures for each test to be utilized by the laboratory.
- D. Submit a sample test report for review by the Engineer to demonstrate conformance with Article 3.2 herein.

1.6 QUALITY ASSURANCE

- A. Except as otherwise indicated, the testing laboratory engaged shall be prequalified by the Ohio Department of Transportation for the types of services specified herein.
- B. The field personnel utilized to perform all field-testing and preparation shall be certified for those tests being performed.

1.7 RESPONSIBILITIES

- A. Testing Laboratory Responsibilities:
 - 1. Provide qualified personnel at the site. Cooperate with the Engineer and Contractor in performance of services.
 - 2. Perform specified sampling and testing of products in accordance with the specified standards.
 - 3. Ascertain compliance of materials and mixes with requirements of the contract documents.
 - 4. Immediately notify the Engineer and Contractor of observed irregularities or nonconformance of work or products.
 - 5. Perform additional tests required by the Engineer.
 - 6. Testing personnel are to report to the Engineer or his representative upon arrival on site for instructions and requirements. Prior to leaving the site, furnish the Engineer or his representative all test results whether in a formal or informal format.
 - 7. Attend preconstruction meetings and progress meetings.
- B. Contractor Responsibilities:
 - 1. Provide access to materials proposed to be used which require testing.
 - 2. Cooperate with laboratory personnel and provide access to the work.
 - 3. Provide incidental labor and facilities:
 - a. To provide access to work to be tested.
 - b. To obtain and handle samples at the site or at the source of products to be tested.
 - c. To facilitate tests.
 - d. To provide storage and curing of test samples as required by the testing laboratory.
 - 4. Notify the Engineer and laboratory 24 hours prior to expected time for operations requiring testing services for scheduling purposes. Materials will not be permitted to be placed without the proper testing being performed in conformance with this Section.

1.8 LIMITS OF LABORATORY AUTHORITY

- A. The laboratory may not release, revoke, alter, or enlarge the requirements of the contract documents.
- B. The laboratory may not approve or accept any portion of the work.
- C. The laboratory may not assume any duties of the Contractor.
- D. The laboratory has no authority to stop the work.

1.9 SCHEDULE OF TESTS

Testing anticipated on this project shall include, but is not limited to:

A. Earthwork

1. Special backfill material sieve analysis per ASTM C-136, one test per source.
2. On-site trench backfill analysis per ASTM D-2487, as directed by Engineer.
3. Pipe bedding and cover sieve analysis per ASTM C-136, one test per source.
4. Drainage fill sieve analysis per ASTM C-136, one test per source.
5. Soil compaction per ASTM D-698.
 - a. Embankment testing shall be at least one (1) test/5,000 S.F. of each lift;
 - b. Trench backfill testing shall be at least one (1) test/50 L.F. of each lift;
 - c. Subgrade and/or subbase testing shall be at least one (1) test/200 L.F. of pavement or 5,000 S.F. of slabs subject to greater frequency due to soil conditions or Engineer's direction.
6. Backfill compaction per ASTM D-4253 and D-4254, one test per 50 L.F. of each lift.
7. Low Strength Mortar testing per ASTM D-4832.

B. Concrete

1. Concrete aggregate deleterious substances per ASTM C-40, ASTM C-117, and ASTM C-142, one test per source.
2. Concrete aggregate abrasion per ASTM C-535, one test per source.
3. Sodium sulfate soundness of coarse aggregate per ASTM C-88, one test per source.
4. Sampling Fresh Concrete: ASTM C-172, except modified for slump to comply with ASTM C 94.
 - a. When cylinders and/or beam samples are made, the slumps and air test shall be made using concrete from the same batch.
 - b. Slump: ASTM C-143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
 - c. Air Content: ASTM C-173, volumetric method of lightweight concrete; ASTM C-231 pressure method for normal weight concrete; at least one for each pour of each type of air-entrained concrete, and each time a set of compression test specimens is made.
 - d. Concrete Temperature: ASTM C-1064, test hourly when air temperature is 40° F. (4° C.) and below, and when 80° F. (27° C.) and above; and each time a set of compression test specimens is made.
 - e. Compression Test Specimen: ASTM C-31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
 - f. Compressive Strength Tests: ASTM C-39; one set for each day's pour exceeding 5 cubic yards plus additional sets for each 50 cubic yards over and above the first 25 cubic yards of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required. A strength test shall be the average of the strengths of two cylinders made from the same sample of concrete and tested at 28 days.
 - i. When frequency of testing will provide less than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.

- ii. 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.
- g. Two (2) tests beams shall be made for each 250 square yards of concrete pavement and/or slabs on grade placed.
 - i. For traffic to be allowed on pavement or slab, the modulus of rupture shall be a minimum of 600 psi for Class C concrete or 400 psi for ODOT Class MS or FS.
- h. When cylinders and/or beam samples are made, the slumps and air test shall be made using concrete from the same batch.
- 5. Nondestructive Testing: Penetration resistance, sonoscope, or other nondestructive devices may be permitted but shall not be used as the sole basis for acceptance or rejection.
- 6. 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, as directed by Engineer. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.
 - a. Contractor shall pay for such tests conducted, and any other additional testing as may be required, when unacceptable concrete is verified.

C. Pavement

- 1. Aggregate base sieve analysis per ASTM D-2940, one test per source.
- 2. Sodium sulfate soundness of aggregate base per ASTM C-88, one test per source.
- 3. Percent of fractured pieces for aggregate base per ODOT Supplement 1021, one test per source.

D. Asphalt

- 1. Provide testing for mixture acceptance in accordance with Ohio Department of Transportation Procedures. The person performing the testing must have a current Level 1 Bituminous Concrete approval from ODOT.

E. Sewers

1. Deflection Testing

- a. All thermoplastic gravity sanitary sewer pipe shall be tested for allowable deflection and with all testing being in accordance with the Cuyahoga County Department of Public Works "Uniform Standards for Sewage Improvements" dated 2019
- b. Deflection tests shall be performed before final acceptance and no sooner than sixty (60) days after installation of final backfill
- c. Maximum allowable pipe deflection shall be five (5) percent of the average inside diameter for the size and class of pipe specified.
- d. Acceptance testing shall be performed with a non-adjustable "go, no-go" mandrel with a minimum of eight (8) contact points. Adjustable mandrels for acceptance testing shall be used only with permission of the Engineer.
- e. The mandrel size shall be ninety-five (95) percent of the average inside diameter for the size and class of pipe specified.
- f. If the "go, no-go" mandrel will not pass through a section of pipe a deflectometer or adjustable mandrel may be used to determine the extent and/or severity of the non-acceptable area. A "go, no-go" mandrel shall be re-run through the pipe section for final acceptance testing at no additional cost to the Owner.

- g. The Contractor or subcontractor performing the test shall be experienced and qualified to perform deflection testing with the equipment and procedures utilized. The contractor shall provide all labor, materials, tools and equipment necessary to clean and test all sections of sewer pipe, locate deficient areas, repair, deficient areas, and retest all repaired areas.
 - h. All sewer runs shall be cleaned prior to testing.
 - i. The acceptance test shall be performed without mechanical pulling devices.
 - j. All pipe failing the deflection test shall be exposed, repaired or replaced and retested at no additional cost to the Owner.
2. Leakage Testing
- a. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
 - b. The Contractor shall perform sufficient tests to determine that the installation of all pipe materials have been as specified and that test results are in accordance with those required for approval of the installation.
 - c. The Contractor shall furnish all pressure gauges, suitable pump or pumps, pipes, test heads, and any other apparatus and materials used for these tests. These tests are to be considered as part of the work, and no additional compensation shall be made.
 - d. The tests shall be conducted under the direction of the Engineer or an appointed agent. Any testing done without direction and supervision as specified shall not be considered as a proper means of approval.
 - e. The Contractor may obtain water for testing as may be required by observing the rules and regulations enforced in the municipality in which the work is being done.
 - f. In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work.
3. Infiltration and Exfiltration Testing
- a. All sewers shall be tested using an exfiltration test or, where specifically allowed in writing by the Engineer, an infiltration test.
 - b. All sewers shall be tested. No visible leakage in the sewers or manholes shall be permitted.
 - c. Bulkheads shall be used to isolate the test sections as required to perform the work. All service laterals, stubs and fittings shall be plugged or capped at the connection to the test section.
 - d. Each manhole run shall be tested separately.
4. Exfiltration Testing
- a. The test shall be performed first with a minimum head of water of three (3) feet above the top of the high end of the sewer or two (2) feet above the high end of the highest lateral in the section or sections to be tested, or three (3) feet above the existing groundwater elevation, whichever is higher.
 - b. The exfiltration test shall be conducted between two manholes by sealing the downstream end of the test section and all inlet sewers at the upstream manhole with pipe stoppers.
 - c. The average internal pressure in the system shall not exceed 11.6 feet of water or 5 psi and the maximum internal pipe pressure at the lowest end shall not exceed 23 feet of water or 10 psi.
 - d. Water shall be added to the pipe section at a steady rate from the upstream manhole to allow air to escape from the sewer until the water is at the specified level above the crown of the pipe. The water may stand in the pipe and manhole up to seventy-two (72) hours prior to measurement of

leakage to allow for absorption by the pipe and bleeding of air. After absorption into the pipe and manhole has stabilized, the water in the upstream manhole shall be brought to test level.

- e. The leakage rate shall be determined by measurement of the drop in water elevation measured in the upstream manhole and the loss of water calculated. The test period shall be a minimum of sixty (60) minutes duration. Use the following table to determine loss of water as measured in the manhole:

Water Level Change in Test Manhole		Volume of Leakage	
		4 Ft. Dia. MH	5 Ft. Dia. MH
(Inches)	(Feet)	(Gals.)	(Gals.)
1/8	0.01	0.98	1.53
1/4	0.02	1.96	3.06
3/8	0.03	2.94	4.59
1/2	0.04	3.92	6.12
5/8	0.05	4.90	7.65
3/4	0.06	5.87	9.18
7/8	0.07	6.85	10.71
1	0.08	7.83	12.24
1-1/8	0.09	8.81	13.77
1-1/4	0.10	9.79	15.30
1-3/8	0.11	10.77	16.83
1-1/2	0.12	11.75	18.36
1-5/8	0.13	12.72	19.89
1-3/4	0.14	13.71	21.42
1-7/8	0.16	14.69	22.90
2	0.17	15.67	24.48

5. Infiltration Testing

- a. An infiltration test shall be conducted for all sections of sewer, only when the ground water level is two (2) feet or more above the elevation of the inside crown of pipe at the upstream limit of the section being tested.
- b. The use of well point pumps or other dewatering devices shall have been discontinued for 24 hours prior to testing to permit the groundwater table to return to a static condition.
- c. The leakage rate shall be measured by a weir, by determination of the time required to fill a container of known volume, or other measuring device approved by the Engineer in the lower end of the sewer section to be tested.
- d. The incoming sewer or sewers in the upper end of the test section shall be securely sealed.

6. Allowable Leakage

- a. The maximum allowable leakage for either infiltration or exfiltration shall be 50 gallons per inch of internal pipe diameter per mile per day.
- b. If actual leakage measured exceeds the limits specified, the Contractor must locate and repair or remove and replace the defective pipe sections to the satisfaction of the Engineer and retest the section accordingly at no additional cost to the Owner.
- c. All sanitary manholes shall be tested separately by using an exfiltration test (or infiltration test where groundwater conditions permit) to two (2) feet above the highest joint with no measurable leakage for a one hour test.

7. Low Pressure Air Testing

- a. PVC sanitary sewers 54-inch diameter and less may be air tested as specified. If the groundwater level is two (2) feet or more above the top of the pipe at the upstream end or if the air pressure required for the test is greater than 5 psig, the air test method should not be used for RCP sanitary sewers.
- b. Each manhole run shall be tested separately, unless otherwise approved by the Engineer, as the construction progresses. Backfill shall be brought to final grade before testing. Testing shall be done prior to surface restoration, and preferably with not more than four (4) manhole runs constructed ahead of testing.
- c. Test equipment consists of valves and pressure gages to control airflow and to monitor pressure within the test section.
- d. The sewer shall be flushed and cleaned prior to testing to clean out any debris. The pipe surface should be wet for more consistent results.
- e. The section of pipe to be tested shall be plugged at each end and the ends of laterals, stubs and fittings to be included in the test section shall be plugged and securely braced to prevent air leakage, and possible blowouts.
- f. Equipment used shall meet the following minimum requirements and be approved by the Engineer:
 - i. Pneumatic plugs shall have a sealing length equal to or greater than the diameter of the pipe to be inspected.
 - ii. Pneumatic plugs shall resist internal test pressures without requiring external bracing or blocking.
 - iii. All air used shall pass through a single control panel.
 - iv. Three (3) individual hoses shall be used for the following connections:
 - a). From control panel to pneumatic plugs for inflation.
 - b). From control panel to sealed line for introducing the low pressure air.
 - c). From sealed line to control panel for continually monitoring the air pressure rise in the sealed line.
- g. All pneumatic plugs shall be seal tested before being used in the actual test installation. One length of pipe shall be laid on the ground and sealed at both ends with the pneumatic plugs to be used for the test. The sealed pipe shall be pressurized to 9 psig. The plugs must hold against this pressure without having to be braced. No persons shall be allowed in the alignment of the pipe during plug testing.
- h. After a manhole to manhole run of pipe has been backfilled and cleaned, and the pneumatic plugs are checked by the above procedure, the plugs shall be placed in the line at each manhole. Low pressure air shall be slowly introduced into this sealed line until the internal air pressure reaches approximately 4 psig greater than the average groundwater back pressure, but not greater than 9 psig for PVC pipe or 5 psig for RCP.
- i. In areas where groundwater is known to exist, the Contractor must determine the average groundwater back pressure. The Contractor shall install a 1/2-inch diameter capped pipe nipple, approximately 10 inches long, through the manhole wall on top of one of the sanitary sewer lines entering the manhole. See Figure No. 1. This shall be done at the time the sanitary sewer line is installed or install an 8-inch diameter stand pipe outside of the manhole backfilled with a column of clean stone of 2-inch minimum diameter to subgrade. Immediately prior to the performance of the low pressure air test, the ground water back pressure shall be determined by removing the pipe cap, blowing air through the pipe nipple

into the ground so as to clear it, and then connecting a clear plastic tube to the nipple. The plastic tube shall be vertical and a measurement of the height, in feet of water over the invert of the pipe shall be taken after the water has stopped rising in this plastic tube. This height, divided by 2.307, will equal the average groundwater back pressure.

- j. At least two (2) minutes shall be allowed for the air to stabilize when the specified internal air pressure has been obtained. When the pressure has stabilized and is at or above 3.5 psig, the air hose from the control panel to the air supply shall be disconnected. The portion of the line being tested shall be termed "acceptable" if the time required in minutes for the pressure to decrease from 3.5 to 2.5 psig (greater than the average groundwater back pressure calculated) shall not be less than the time in the tables in Reference Table 1.
- k. If a one (1) psi drop in pressure does not occur within the test time, the line has passed. If the pressure drop is more than one (1) psi during the test time, the line is presumed to have failed the test. If the line fails the test, segmented testing may establish the location of any leaks.
- l. The Contractor must repair the leak or remove and replace the defective pipe section and re-test the section to the satisfaction of the Engineer at no additional cost to the Owner.
- m. The pneumatic plugs must be installed in such a way as to prevent blowouts. Inasmuch as a force of 250 pounds is exerted on an 8-inch plug by an internal pipe pressure of 5 psi, it should be realized that sudden expulsion of a poorly installed plug or a plug, which is partially deflated before the pipe pressure is released, can be dangerous.
- n. The Contractor should internally restrain or externally brace the plugs to the manhole wall as an added safety precaution throughout the test.
- o. Pressurizing equipment shall include a regulator or relief valve set at no higher than 9 psig for PVC pipe or 5 psig for RCP pipe to avoid over-pressurizing and damaging an otherwise acceptable line.
- p. No one shall be allowed in the trench or manholes during testing.
- q. Plugs shall not be removed until all pressure has been released.
- r. All sanitary manholes shall be tested separately by using an exfiltration test (or infiltration test where groundwater conditions permit) to two (2) feet above the highest joint with no measurable leakage for a one hour test.
- s. The air test data sheet marked Exhibit "A" at the end of this section shall be filled out for each section of piping tested in this manner.
- t. Testing concrete pipe sewer lines by the low pressure air test method will be per ASTM C924-02 and C1103.

8. Manhole Vacuum Testing

- a. Manholes are to be vacuum tested in accordance with the procedures of ASTM C-1244. Temporarily plug all pipe entering the manhole. Each plug must be installed at a location beyond the manhole/pipe gasket (i.e. outside the manhole wall), and shall be braced to prevent the plug or pipe from being drawn into the Manhole.
- b. The test head shall be placed inside the rim of the cast iron frame at the top of the manhole and inflated, in accordance with the manufacturer's recommendations.
- c. A vacuum of at least 10 inches of mercury (10" Hg) shall be drawn on the manhole. Shut the line on the vacuum line to the manhole and shut off the pump or disconnect the vacuum line from the pump.
- d. The pressure gauge shall be liquid filled, having a 3.5" diameter face with a reading from zero to thirty inches of mercury.

- e. The manhole shall be considered to pass the vacuum test if the vacuum reading does not drop more than 1" Hg (i.e from 10" to 9" Hg) during the Table 1 minimum test time.
- f. If a manhole fails the vacuum test, the manhole shall be repaired with non-shrinkable grout or other material or method approved by the engineer. The manhole surfaces shall be properly prepared prior to any repairs. Once the repair material has cured according to the manufacturer's recommendations, the vacuum test shall be repeated. This process shall continue until a satisfactory test is obtained.
- g. All temporary plugs and braces shall be removed after each test.

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION

3.1 SEQUENCING AND SCHEDULING

- A. The Contractor shall coordinate the sequence of work activities so as to accommodate required testing and shall allow sufficient time for testing of materials by the laboratory so as to cause no delay in the work or the work of any other Contractor. In addition, the Contractor shall coordinate his work so as to avoid the necessity of removing and replacing work to accommodate inspections and tests.

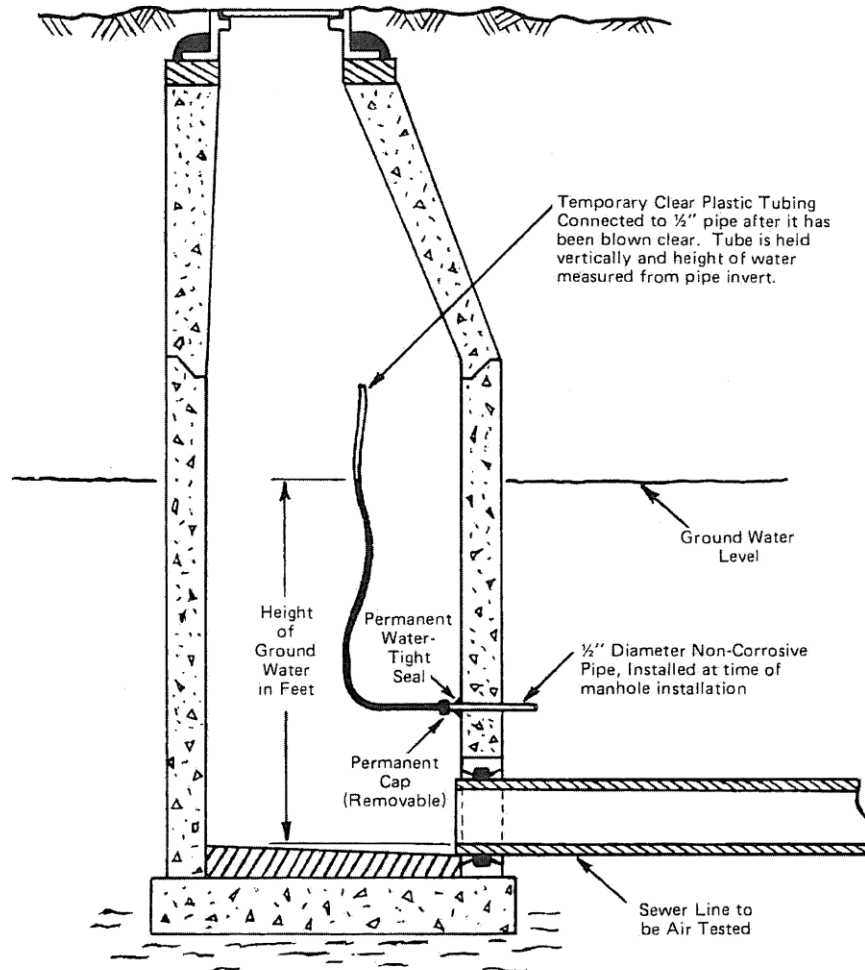
3.2 LABORATORY TEST RESULTS

- A. The testing laboratory shall submit a certified written report of each inspection, test, or similar service concurrently to the Owner, Engineer, and Contractor.
- B. Written reports of each inspection, test, or similar service shall include, but not be limited to, the following:
 - 1. Name of testing laboratory.
 - 2. Project name and construction contract reference number.
 - 3. Dates and locations of samples and tests or inspections.
 - 4. Date of report.
 - 5. Names of individuals making the inspection or test.
 - 6. Designation of the work and test method.
 - 7. Test results.
 - 8. Notation of significant ambient conditions at the time of sample taking and testing.

END OF SECTION 013319

FIGURE NO. 1

**MANHOLE CROSS-SECTIONAL VIEW
OF THE PROPER METHOD FOR
DETERMINING GROUND WATER HEIGHT**



**AIR TEST DATA SHEET
PIPE TESTING FORM**

NOTE: Pressurize pipe to 4.5 P.S.I.F. and let stabilize for 5 minutes. Pressure should then be backed off to 4.0 P.S.I.G. and test time started.

JOB NAME: _____ **SANITARY** ☐ **STORM** ☐ **DATE:** _____
JOB LOCATION: _____ **TEST COMPANY:** _____
JOB NO. _____ **PROJECT REP:** _____
SPECIFIED PRESSURE DROP () P.S.I.G. **BASE PRESSURE: 4.0 P.S.I.G.** **PIPE MATERIAL:** _____
 (See Table 1 or Table II for Reference) (Note: No test shall exceed 9.0 P.S.I.G.)

PIPE SECTION UNDER TEST					GROUND WATER DEPTH	BASE P.S.I.G. PLUS GROUND WATER ADJ. (÷ 2.31=P.S.I.G.)	TEST TIME DURATION	TEST START TIME	TEST STOP TIME	TEST TIME ELAPSED	PASS FAIL P or F
UPSTREAM MH/STATION	DN-STREAM MH/STATION	PIPE DIAMETER	PIPE LENGTH								

* Identify any section(s) that failed:
 * Leak (was) (was not) located. Method used:
REMARKS:

TABLE I

Minimum specified time required for a 1.0 P.S.I.G. Pressure Drop

1 Pipe Diameter (Inches)	2 Minimum Time (Min:Sec)	3 Length for Minimum Time (Ft.)	4 Time for Longer Length (Sec)	Specification Time for Length (L) Shown (Min:Sec)							
				100 Ft.	150 Ft.	200 Ft.	250 Ft.	300 Ft.	350 Ft.	400 Ft.	450 Ft.
4	3:46	597	.380 L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	.854 L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33
27	25:30	88	17.306 L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15
33	31:10	72	28.852 L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53
36	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46
42	39:48	57	41.883 L	69:48	104:42	139:37	174:30	209:24	244:19	279:13	314:07
48	45:34	50	54.705 L	91:10	136:45	182:21	227:55	273:31	319:06	364:42	410:17
54	51:02	44	69.236 L	115:24	173:05	230:47	288:29	346:11	403:53	461:34	519:16
60	56:40	40	85.476 L	142:28	213:41	284:55	356:09	427:23	498:37	569:50	641:04

for size and length of pipe indicated for Q = 0.0015

NOTE: If there has been no leakage, (zero P.S.I.G. drop), after one hour of testing, the test shall be accepted and the test complete. (See Section 7.5)

TABLE II

Minimum specified time required for a 0.5 P.S.I.G. Pressure Drop

for size and length of pipe indicated for Q = 0.0015

1 Pipe Diameter	2 Minimum Time	3 Length for Minimum	4 Time for Longer	Specification Time for Length (L) Shown (Min:Sec)							
				100 Ft.	100 Ft.	100 Ft.	100 Ft.	100 Ft.	100 Ft.	100 Ft.	100 Ft.

(Inches)	(Min:Sec)	um Time (Ft.)	Length (Sec)								
4	1:53	597	.190 L	1:53	1:53	1:53	1:53	1:53	1:53	1:53	1:53
6	2:50	398	.427 L	2:50	2:50	2:50	2:50	2:50	2:50	2:51	3:12
8	3:47	298	.760 L	3:47	3:47	3:47	3:47	3:48	4:26	5:04	5:42
10	4:43	239	1.187 L	4:43	4:43	4:43	4:57	5:56	6:55	7:54	8:54
12	5:40	199	1.709 L	5:40	5:40	5:42	7:08	8:33	9:58	11:24	12:50
15	7:05	159	2.671 L	7:05	7:05	8:54	11:08	13:21	15:35	17:48	20:02
18	8:30	133	3.846 L	8:30	9:37	12:49	16:01	19:14	22:26	25:38	28:51
21	9:55	114	5.235 L	9:55	13:05	17:27	21:49	26:11	30:32	34:54	39:16
24	11:20	99	6.837 L	11:24	17:57	22:48	28:30	34:11	39:53	45:35	51:17
27	12:45	88	8.653 L	14:25	21:38	28:51	36:04	43:16	50:30	57:42	64:54
30	14:10	80	10.683 L	17:48	26:43	35:37	44:31	53:25	62:19	71:13	80:07
33	15:35	72	12.926 L	21:33	32:19	43:56	53:52	64:38	75:24	86:10	96:57
36	17:00	66	15.384 L	25:39	38:28	51:17	64:06	76:55	89:44	102:34	115:23
42	19:54	57	20.942 L	34:54	52:21	69:49	87:15	104:42	122:10	139:37	157:04
48	22:47	50	27.352 L	45:35	68:23	91:11	113:58	136:46	159:33	182:21	205:09
54	25:31	44	34.618 L	57:42	86:33	115:24	144:15	173:05	201:56	230:47	259:38
60	28:20	40	42.738 L	71:14	106:51	142:28	178:05	213:41	249:18	284:55	320:32

NOTE: If there has been no leakage, (zero P.S.I.G. drop), after one hour of testing, the test shall be accepted and the test complete. (See Section 7.5)

**CT CONSULTANTS, INC.
HYDROSTATIC LEAKAGE TEST**

JOB. NO. _____ PROJECT: _____

CONTRACTOR: _____ CLIENT: _____

WATERLINE TESTED AT: _____
(Street Name) (Station of Gauge)

FROM STATION _____ TO STATION _____ ON _____

WATERLINE SIZE _____ TYPE _____

TESTED _____, _____ AT _____ FOR _____
TOTAL L.F. PIPE SIZE PSI DURATION

ALLOWABLE LEAKAGE _____ PER 1,000 L.F. OR _____ PER _____
GALS./HR. TOTAL GALS. TOTAL L.F.

1ST TEST _____, _____ AND _____
PASS / FAIL PRESSURE LOST GALLONS LOST

2ND TEST _____, _____ AND _____
PASS / FAIL PRESSURE LOST GALLONS LOST

APPROVED BY _____
(INSPECTOR)

COMMENTS: _____

ALLOWABLE LEAKAGE PER 1,000 FEET OF WATERMAIN:

<u>PIPE SIZE</u> <u>INCH DIAMETER</u>	<u>ALLOWABLE LEAKAGE</u> <u>GALS. / 1,000 FEET</u>
6	1
8	1.3
10	1.6
12	1.9
16	2.5
20	3.2
24	3.8
30	4.8
36	5.7

NOTE: IN NO CASE SHALL THE TESTED SECTION EXCEED 2,000 FEET IN LENGTH.

PROJECT: _____ **SHEET NO. 1 OF** _____

JOB NO. _____ **STREET:** _____

CONTRACTOR: _____ **PROJECT REP:** _____

MANHOLE VACUUM TEST

M.H. NO.	M.H. Diameter (in.)	M.H. Depth (ft.) (btm.m.h. cover to shelf)	Vacuum Required (in Hg)	Vacuum Attained (in Hg)	Vacuum Drop (in Hg)	Holding Time Required (sec.)	Pass/Fail	Date Tested	Contractor Attest	Engineer Attest	Remarks

TABLE 1 – Minimum Test Times for Various Manhole Diameter									
Depth		Diameter, in.							
(ft)	30	33	36	42	48	54	60	66	72
Time(s)									
8	11	12	14	17	20	23	26	29	33
10	14	15	18	21	25	29	33	36	41
12	17	18	21	25	30	35	39	43	49
14	20	21	25	30	35	41	46	51	57
16	22	24	29	34	40	46	52	58	67
18	25	27	32	38	45	52	59	65	73
20	28	30	35	42	50	53	65	72	81
22	31	33	39	46	55	64	72	79	89
24	33	36	42	51	59	64	78	87	97
26	36	39	46	55	64	75	85	94	105
39	39	42	49	59	69	81	91	101	113
42	42	45	53	63	74	87	98	108	121

Note: Allowable drop equals 1 in. Hg for time shown

PROJECT REP: _____
DATE: _____

SECTION 013323 - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

1.1 GENERAL

- A. The Contractor shall submit detailed drawings, acceptable catalog data, specifications and material certifications for all equipment and materials specified or required for the proper completion of the work.
- B. The intent of these items is to demonstrate compliance with the design concept of the work and to provide the detailed information necessary for the fabrication, assembly and installation of the work specified. It is not intended that every detail of all parts of manufactured equipment be submitted, however sufficient detail will be required to ascertain compliance with the specifications and establish the quality of the equipment proposed.

Shop Drawings shall be sufficiently clear and complete to enable the Engineer/Architect and Owner to determine that items proposed to be furnished conform to the specifications and that items delivered to the site are actually those that have been reviewed.

- C. It is emphasized that the Engineer/Architect's review of Contractor's submitted data is for general conformance to the contract drawings and specifications but subject to the detailed requirements of drawings and specifications. Although the Engineer/Architect may review submitted data in detail, such review is an effort to discover errors and omissions in Contractor's drawings. The Engineer/Architect's review shall in no way relieve the Contractor of his obligation to properly coordinate the work and to Engineer/Architect the details of the work in such manner that the purposes and intent of the contract will be achieved. Such review by the Engineer/Architect shall not be construed as placing on him or on the Owner any responsibility for the accuracy and for proper fit, functioning or performance of any phase of the work included in the contract.
- D. Shop Drawings shall be submitted in proper sequence and with due regard to the time required for checking, transmittal and review so as to cause no delay in the work. The Contractor's failure to transmit appropriate submittals to the Engineer/Architect sufficiently in advance of the work shall not be grounds for time extension.
- E. The Contractor shall submit Shop Drawings for all fabricated work and for all manufactured items required to be furnished in the Contract in accordance with the General Provisions and as specified herein. Shop Drawings shall be submitted in sufficient time to allow at least twenty-one (21) calendar days after receipt of the Shop Drawings from the Contractor for checking and processing by the Engineer/Architect.
- F. It is the responsibility of each Prime Contractor to furnish to all other Prime Contractors and especially the General Construction Contractor reviewed Shop Drawings for guidance in interfacing the various trades; i.e., sleeves, inserts, anchor bolts, terminations, and space requirements.

- G. No work shall be performed requiring Shop Drawings until same have been reviewed by Engineer/Architect.
- H. Accepted and reviewed Shop Drawings shall not be construed as approval of changes from Contract plan and specification requirements.
- I. The Engineer/Architect will review the first and second Shop Drawing item submittals at no cost to the Contractor. Review of the third submittal and any subsequent submittal will be at the Contractor's expense. Payment will be deducted from the Contract amount at a rate of 2.8 times direct labor cost plus expenses.

1.2 SUBMITTAL PROCEDURE

- A. All required submissions shall be made to the Engineer/Architect by the Prime Contractor(s) only. Any data prepared by subcontractors and suppliers and all correspondence originating with subcontractors, suppliers, etc., shall be submitted through the Contractor.
- B. Contractor shall review and approve all Shop Drawings prior to submission. Contractor's approval shall constitute a representation to Owner and Engineer/Architect that Contractor has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data or assumes full responsibility for doing so, and that Contractor has reviewed or coordinated each Shop Drawing or sample with the requirements of the work and the Contract Documents.
- C. Submittal Preparation: Mark each submittal with a permanent label or page for identification. Provide the following information on the label for proper processing and recording of action taken:
 - 1. Location
 - 2. Project Name
 - 3. Contract
 - 4. Name and Address of Engineer/Architect
 - 5. Name and Address of Contractor
 - 6. Name and Address of Subcontractor
 - 7. Name and Address of Supplier
 - 8. Name of Manufacturer
 - 9. Number and Title of appropriate Specification Section
 - 10. Drawing Number and Detail References, as appropriate.
 - 11. Submittal Sequence or Log Reference Number.
 - a. Provide a space on the label for the Contractor's review and approval markings and a space for the Engineer/Architect's "Action Stamp".
- D. Each Shop Drawing, sample and product data submitted by the Contractor shall have affixed to it the following Certification Statement including the Contractor's Company name and signed by the Contractor:

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog

numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Signature

Date

Company

- E. Shop Drawings shall be submitted in not less than six (6) copies to the Engineer/Architect at the address specified at the Preconstruction Conference. Single mylar or sepia reproducible copies of simple Shop Drawings may be submitted with prior approval of the Engineer/Architect.
- F. At the time of each submission, Contractor shall in writing identify any deviations that the Shop Drawings or samples may have from the requirements of the Contract Documents.
- G. Drawings shall be clean, legible and shall show necessary working dimensions, arrangement, material finish, erection data, and like information needed to define what is to be furnished and to establish its suitability for the intended use. Specifications may be required for equipment or materials to establish any characteristics of performance where such are pertinent. Suitable catalog data sheets showing all options and marked with complete model numbers may, in certain instances, be sufficient to define the articles which it is proposed to furnish.
- H. SAMPLES: For product which require submittal of samples, furnish samples so as not to delay fabrication, allowing the Engineer reasonable time for the consideration of the samples submitted. Properly label samples, indicating the material or product represented, its place of origin, the names of the vendor and Contractor and the name of the project for which it is intended. Ship samples prepaid. Accompany samples with pertinent data required to judge the quality and acceptability of the sample, such as certified test records and, where required for proper evaluation, certified chemical analyses.

1.3 REVIEW PROCEDURE

- A. Engineer/Architect will review with reasonable promptness all properly submitted Shop Drawings. Such review shall be only for conformance with the design concept of the Project and for compliance with the information given in the plans and specifications and shall not extend to means, methods, sequences, techniques or procedures of construction or to safety precautions or programs incident thereto.
- B. The review of a separate item as such will not constitute the review of the assembly in which the item functions. The Contractor shall submit entire systems as a package.
- C. All Shop Drawings submitted for review shall be stamped with the Engineer/Architect's action and associated comments.
- D. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Engineer/Architect will review each submittal, mark to

indicate action taken, and return accordingly. Compliance with specified characteristics is the Contractor's responsibility.

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 the action taken:

1. If Shop Drawings are found to be in general compliance, such review will be indicated by marking the first statement.
 2. If only minor notes in reasonable number are needed, the Engineer/Architect will make same on all copies and mark the second statement. Shop Drawings so marked need not be resubmitted.
 3. If the submitted Shop Drawings are incomplete or inadequate, the Engineer/Architect will mark the third statement, request such additional information as required, and explain the reasons for revision. The Contractor shall be responsible for revisions, and/or providing needed information, without undue delay, until such Shop Drawings are acceptable. Shop Drawings marked with No. 3 shall be completed resubmitted.
 4. If the submitted Shop Drawings are not in compliance with the Contract Documents, the Engineer/Architect will mark the fourth statement. The Contractor will be responsible to submit a new offering conforming to specific products specified herein and/or as directed per review citations.
- E. No submittal requiring a Change Order for either value or substitution or both, will be returned until the Change Order is approved or otherwise directed by the Owner.

APPLICATION FOR USE OF SUBSTITUTE ITEM

TO: _____

PROJECT: _____

SPECIFIED ITEM:

Page	Paragraph	Description
A.		The undersigned requests consideration of the following as a substitute item in accordance with Article 6.05 of the General Conditions.
B.		Change in Contract Price (indicate + or -) \$ _____
C.		Attached data includes product description, specifications, drawings, photographs, references, past problems and remedies, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified. For consideration of the attached data as SHOP DRAWINGS, submittal shall be in accordance with requirements of Section 013323.
D.		Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments are correct:

1. The proposed substitute does not affect dimensions shown on Drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing, and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other contractors, the construction schedule, or specified warranty requirements. (If proposed substitution affects construction schedule, indicate below using + or -)

_____ CONSECUTIVE CALENDAR DAYS

4. Maintenance and service parts will be locally available for the proposed substitution.

The undersigned further states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item, and agrees to reimburse the OWNER for the charges of the ENGINEER for evaluating this proposed substitute item.

E. Signature:

Firm:

Address:

Telephone:

Date:

Attachments:

For use by ENGINEER:

_____ Accepted as evidenced by affixed SHOP DRAWING REVIEW stamp.

_____ Accepted as evidenced by included CHANGE ORDER.

_____ Not accepted as submitted. See Remarks.

_____ Acceptance requires completion of submittal as required for SHOP DRAWINGS.

_____ Not accepted. Do not resubmit.

By:

Date:

Remarks:

APPLICATION FOR USE OF "OR-EQUAL" ITEM

TO: _____

PROJECT: _____

SPECIFIED ITEM:

Page	Paragraph	Description
A.		The undersigned requests consideration of the following as an "or-equal" item in accordance with Article 6.05 of the General Conditions. _____
B.		Change in Contract Price (indicate + or -) \$ _____
C.		Attached data includes product description, specifications, drawings, photographs, references, past problems and remedies, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified. For consideration of the attached data as SHOP DRAWINGS, submittal shall be in accordance with requirements of Section 013323.
D.		Signature: _____ Firm: _____ Address: _____ _____

Telephone: _____ Date: _____

Attachments: _____

For use by ENGINEER:

Accepted as evidenced by affixed SHOP DRAWING REVIEW stamp.

Accepted as evidenced by included CHANGE ORDER.

Not accepted as submitted. See Remarks.

Acceptance requires completion of submittal as required for SHOP DRAWINGS.

Not accepted. Do not resubmit.

By: _____ Date: _____

Remarks: _____

END OF SECTION 013323

SECTION 013326 – PRODUCT TESTING AND CERTIFYING

PART 1 - GENERAL

1.1 QUALITY OF MATERIALS

- A. Where the specifications call for mill or shop tests, the Contractor shall furnish duplicate copies of attested manufacturer's certificates showing details of quality or performance sufficient to demonstrate conformity to contract requirements. Mill, shop or witness tests shall be subject to view by the Engineer's representative, but the Engineer's representation shall not relieve the Contractor from the necessity of furnishing certificates specified. The Engineer shall be notified by the Contractor in writing, sufficiently in advance of the time of making tests, so that proper arrangements may be made. Waiving of witness of tests by the Engineer may be in writing only by the Engineer. All costs for travel, lodging, food and transportation that are necessary for the Engineer's representative and the Owner's representative to attend witness tests shall be included in the Contractor's bid for those item(s) specifically designated as being subject to witness testing.
- B. Unless otherwise specified, all materials, equipment and articles shall be erected, installed, applied, or connected, used, cleaned and conditioned in accordance with the printed instructions and directions of the manufacturer.
- C. The installation shall be so made that its several component parts will function together as a workable system. It shall be complete with all accessories necessary for its operation and shall be left with all equipment properly adjusted and in working order.
- D. The work shall be executed in conformity with the best practice and so as to contribute to efficiency of operation, minimum maintenance, accessibility and sightliness. It shall also be executed so that the installation will conform and accommodate itself to the building structure, its equipment and usage.
- E. Whenever in the contract documents a particular brand, make of material, device or equipment is shown or specified, such brand, make of material, device or equipment is to be regarded merely as a standard and such trade name shall be followed by "or equal".

1.2 QUALITY ASSURANCE

- A. The equipment and materials to be furnished under this Contract shall be the products of well established and reliable firms which have had ample experience for at least five (5) years in the manufacture of equipment or materials similar in design and of equal quality to that specified. If required, the manufacturer shall submit a list of installations of similar equipment which have been in successful operation for at least five (5) years.

1.3 EXPERIENCE CLAUSE REQUIREMENT AND PERFORMANCE BONDS FOR MANUFACTURER

- A. For every piece of equipment furnished under this Contract, the manufacturer will be required to have a minimum of five (5) years of experience in providing this specific type of equipment. In lieu of this experience requirement, the manufacturer will be required to provide performance bond(s) for the faithful performance of the equipment and guarantee payment in a sum of not less than one hundred and fifty percent (150%) of the total equipment price for the completed work for that item. In the absence of verifiable experience, the manufacturer will be required to provide the performance bond(s) for the same number of years that the manufacturer was found lacking in experience from the specified five (5) year period. The performance bond(s) shall be from an approved surety company, to the satisfaction of the Owner's Law Director.
- B. Agents of bonding companies which write bonds for the performance and payment of the contract shall furnish power of attorney bearing the seal of the company, evidencing such agent's authority to execute the particular type of bond to be furnished, and evidencing also the right of the surety company to do business in the State of Ohio. Copy of this proof shall be attached to each copy of the contract.
- C. The bond shall be purchased through a surety company with a local agent upon whom service of process can be made.
- D. In event of failure of surety or co-surety, the manufacturer shall immediately furnish a new bond, as required herein. The manufacturer's bond will not be released until all provisions of the contract have been fulfilled.
- E. The surety used for the bid bond and performance bond shall be listed in the latest U.S. Treasury Circular 570 and the Penal Sums shall be within the maximum specified for such company in said Circular 570.

END OF SECTION 013326

SECTION 013326.01 - QUALITY CONTROL PLAN

PART 1 - GENERAL

1.1 QUALITY CONTROL

- A. The Contractor shall be responsible for the quality of all materials incorporated into the project work and shall be responsible for all costs of testing and certification of same. The Contractor shall provide the City Engineer a list of three (3) local qualified firms for the City to select from to be the Contractor's testing firm.
- B. The Contractor shall provide the Engineer with a Quality Control Plan in which his testing methods/procedures are defined. Said Plan shall meet with the approval of the Engineer and include identification of laboratories, types of testing, and the tentative amount and scheduling of each.

All certifications of tests and/or gradations for materials to be utilized in the work and all quality control testing shall be performed by an independent laboratory (not affiliated with, owned by, or managed by the Contractor). The laboratory shall be accredited by the AASHTO Materials Reference Laboratory for the type of testing performed.

- C. The Owner may perform field Quality Assurance testing; however, such testing shall not relieve the Contractor from the responsibility of Quality Control testing or from supplying certificates from manufacturers or suppliers to demonstrate compliance with the specifications. It is intended that the testing by the Contractor and the Owner be complimentary toward a quality project; however, the Contractor may not assume the Owner will test or that any tests will be done in lieu of the Contractor's own Quality Control testing. In the same sense, the Contractor may not rely on Owner Quality Assurance testing as a basis of acceptance or approval of his work nor may any Owner performed testing be reflected in his submitted plan.

1.2 TEST CRITERIA

- A. The following tests at a minimum shall be included with the Contractor's Quality Control Plan in accordance with the specifications:
 - 1. Aggregates
 - a. For each material and/or different source, the laboratory shall perform soundness, gradation, and other tests for all parameters specified. Aggregates incorporated into concrete or asphalt mixes shall also be tested for moisture content daily.

2. Compaction Tests

- a. Compaction tests or field density tests shall be taken on all embankment, trench backfill, subgrade, and subbase materials.
- b. Minimum testing shall be as follows:
Embankment testing shall be at least one (1) test/5000 S.F. of each lift;
Trench backfill testing shall be at least one (1) test/50 L.F. of each lift;
Subgrade and/or subbase testing shall be at least one (1) test/200 L.F. of pavement or /5000 S.F. of slabs; subject to greater frequency due to soil conditions or Engineer's direction.
- c. Proctors or relative density tests shall be performed as often as necessary for the differing soils or granular materials utilized. Proctors shall be run with a minimum of 5 points. Test reports shall show the wet (bulk) weight, dry weight, wet (bulk) density, dry density, moisture content weight and moisture content percentage. Both the dry curve and the wet curve shall be plotted. The source materials shall be tested for gradation, Atterberg limits, shore-hydrometer and moisture content.

3. Concrete Mix Design

- a. For each type of concrete, the laboratory shall perform the necessary mix design providing all test data as required by the specifications.

4. Concrete Field and Laboratory Tests

- a. The laboratory shall cast concrete cylinders and test beams:
 - 1) One set of four cylinders per 50 C.Y. with a minimum of two sets per day. The cylinders shall be broken: one at 7 days, two at 28 days, one at 56 days, unless otherwise directed by the Engineer.
 - 2) One beam per 50 C.Y. with a minimum of two beams per day.
- b. Temperature and unit weight shall be run on fresh concrete at intervals sufficient for the type of structure being placed and a minimum of once per day. Bulk weight, bucket weight, (tare), net weight, bucket factor (bucket volume) and unit weight shall be recorded on the fresh concrete report. Show all batch weights for yield calculations. Slump and air content tests shall be taken a minimum of one test per 20 C.Y. and at least once per day.
- c. All field and laboratory testing shall be performed by technicians certified by the American Concrete Institute (ACI) for the type of testing performed.
- d. Initial cure of all cylinders shall be in a temperature controlled cure box or temperature controlled water tank with a hi-low thermometer. Hi-low temperature readings shall be recorded on the fresh concrete report.

5. Asphalt Mix Design

- a. For each type of asphalt mix, submit job mix formula (JMF) prepared by an ODOT pre-qualified laboratory from tests performed on the aggregates proposed for use.
- b. Sample and test for gradation and bitumen content as per ODOT 441.
- c. Asphalt compaction, thickness, and temperature tests shall be performed during asphalt placement per ODOT Item 448.

1.3 LABORATORY REPORTS

- A. Reports of laboratory and field tests will be distributed to the Engineer, Owner, and Suppliers within 24 hours of completion.

END OF SECTION 013326.01

SECTION 013543 - ENVIRONMENTAL PROTECTION

PART 1 - GENERAL

1.1 UNNECESSARY NOISE, DUST AND ODORS

- A. The Contractor's performance of this contract shall be conducted so as to eliminate all unnecessary noise, dust and odors.

1.2 SEWAGE, SURFACE AND FLOOD FLOWS

- A. The Contractor shall take whatever action is necessary to provide all necessary tools, equipment and machinery to adequately handle all sewage, surface flows and flood flows which may be encountered during the performance of the work. The entire cost of and liability for handling such flows is the responsibility of the Contractor and shall be included in the price for the appropriate item.

1.3 WORK IN FREEZING WEATHER

- A. Written permission from the Engineer shall be obtained before any work is performed which, in the judgment of the Engineer, may be affected by frost, cold, or snow. When work is performed under such conditions, the Contractor shall provide facilities for heating the materials and for protecting the finished work.

1.4 POLLUTION CONTROL

- A. It shall be the responsibility of the Contractor to prevent or limit pollution of air and water resulting from his operations.
- B. The Contractor shall perform work required to prevent soil from eroding or otherwise entering onto all paved areas and into natural watercourses, ditches, and public sewer systems. This work shall conform to all local ordinances and/or regulations, if any, and if not otherwise regulated by local ordinances or regulations shall at a minimum conform to the Ohio EPA General Storm Water NPDES Permit for Construction Activities and the Ohio Department of Natural Resources Rainwater and Land Development manual. This work may consist of but not be limited to construction and continual maintenance of silt fence, bio bag filters, sedimentation traps, stilling basins, check dams, temporary seeding, temporary mulching, erosion mats and other means to clarify waters containing suspended materials from excavations, embankments, cleared and grubbed or stripped areas, stockpiles, well points, and disposal sites and shall be commensurate with the contractor's schedule, sequence of work, means and methods. If a SWPPP plan is not required for the project, the contractor shall at a minimum submit a plan of his proposed erosion control prevention methods for approval by the Owner and/or other regulatory authorities having jurisdiction prior to starting any construction activities which may cause erosion.

- C. The Contractor shall perform work required to prevent dust attributable to his operations from entering the atmosphere. Dust on unsurfaced streets or parking areas and any remaining dust on surfaced streets shall be controlled with water and/or calcium chloride dust palliative as needed.
- D. Any material removed from sanitary, or storm sewers shall be disposed in accordance with all applicable regulations.

END OF SECTION 013543

SECTION 014126 - GENERAL REGULATIONS AND PERMITS

PART 1 - GENERAL

1.1 REGISTRATION

All Contractors and subcontractors shall be registered with the Building Department having jurisdiction. Contact the Building Department for additional registration information.

1.2 PERMITS

The Contractor shall apply for and pay for all permits from the Owner and/or other authorities having jurisdiction.

1.3 ARCHAEOLOGICAL DISCOVERIES

Contractors and subcontractors are required under Ohio Revised Code (O.R.C.) Section 149.53, to notify Ohio's State Historic Preservation Office (SHPO), and to cooperate with that office in archaeological and historic surveys and mitigation efforts if such discoveries are uncovered within the project area.

Contact: Ohio's State Historic Preservation Office
Diana Welling, Resource Protection & Review Department Manager
Phone: 1-614-298-2000
Email: dwelling@ohiohistory.org

Should archaeological discoveries or other activities delay progress of the work, an adjustment in contract time will be made.

END OF SECTION 014126

SECTION 014223 - INDUSTRY STANDARDS

PART 1 - GENERAL

1.1 ABBREVIATIONS

- A. Abbreviations, as used, designate the following:

AASHTO	-	American Association of State Highway and Transportation Officials
ACI	-	American Concrete Institute
AIEE	-	American Institute of Electrical Engineers
AISC	-	American Institute of Steel Construction
ANSI	-	American National Standards Institute
ASTM	-	American Society of Testing and Materials
AWWA	-	American Water Works Association
CMS	-	Construction and Material Specifications
NEMA	-	National Electrical Manufacturers Association
ODOT	-	Ohio Department of Transportation
ORC	-	Ohio Revised Code
UL	-	Underwriters Laboratories, Inc.

1.2 REFERENCE TO OTHER SPECIFICATIONS

- A. Where reference is made to specifications such as ASTM, AWWA or AASHTO, the latest edition shall be used, unless otherwise noted on the plans or in the specifications.

1.3 CODES AND STANDARDS

- A. All work provided for by these specifications must be installed according to the provisions of the State and local building codes, subject to inspection and acceptance by the State and local inspectors.

END OF SECTION 014223

SECTION 014323 – QUALIFICATIONS OF TRADESMEN

PART 1 - GENERAL

1.1 CHARACTER OF WORKMEN AND EQUIPMENT

- A. The Contractor shall employ competent and efficient workmen for every kind of work. Any person employed on the work who shall refuse or neglect to obey directions of the Owner or his representative, or who shall be deemed incompetent or disorderly, or who shall commit trespass upon public or private property in the vicinity of the work, shall be dismissed when the Owner so orders, and shall not be re-employed unless express permission be given by the Owner. The methods, equipment and appliances used on the work and the labor employed shall be such as will produce a satisfactory quality of work, and shall be adequate to complete the contract within the specified time limit.
- B. In hiring of employees for the performance of work under this Contract, or any Subcontract hereunder, no Contractor or Subcontractor, nor any person acting on behalf of such Contractor or Subcontractor, shall, by reason of race, sex, creed or color, discriminate against any citizen of the State of Ohio in the work to which the employment relates. No Contractor, Subcontractor, nor any person on his behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this contract on account of race, creed, sex or color.

END OF SECTION 014323

SECTION 015526 - TEMPORARY TRAFFIC CONTROL DEVICES

PART 1 - GENERAL

1.1 BARRICADES, SIGNS AND LIGHTS

- A. The Contractor shall employ watchmen on the work when and as necessary. The Contractor shall erect and maintain such strong and suitable barriers and such lights as will effectively prevent the occurrence of any accident to health, limb or property. Lights shall be maintained between the hours of one-half (1/2) hour after sunset and one-half (1/2) hour before sunrise.
- B. No manhole, trench, excavation will be left open awaiting connection or removal at a later date by the Contractor's forces or others but shall be temporarily backfilled and resurfaced if applicable with a temporary pavement passable to traffic at no additional cost to the Owner.
- C. In addition to other safety requirements, a minimum of four (4) foot high fence will be incorporated around any shaft or manhole or other excavation left open at the end of a day's work.

1.2 MAINTENANCE OF TRAFFIC

- A. The Contractor is required to provide maintenance of traffic in conformance with the Ohio Manual of Uniform Traffic Control Devices and Item 614 of the current Construction and Material Specifications of the Ohio Department of Transportation.
- B. This work shall include providing suitable and satisfactorily trained and properly attired flagmen for use at any location where existing roadway is narrowed to a width of less than 2 full lanes (18 feet).
- C. The Contractor is also responsible for maintaining local access to all residences and businesses along the route of the construction and to provide whatever temporary materials are necessary to provide a safe, adequate drive surface.
- D. At all boring locations, Contractor shall provide suitable flashers, barricades, and traffic control devices as may be deemed necessary by the Engineer or the responsible authority in the case of the Department of Transportation, Turnpike Commission, or affected railroad. This may extend to maintain facilities on a 24-hour basis until such time as the areas are completely backfilled.

END OF SECTION 015526

SECTION 015713 - TEMPORARY EROSION CONTROL

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Furnishing all labor, materials, tools, equipment and services for the temporary soil erosion and sediment control work as indicated.
- B. Coordinating the temporary pollution and erosion control with work of all other trades.
- C. Reducing to the greatest extent practicable the area and duration of exposure of readily erodible soils.
- D. Protecting the soils by use of temporary vegetation or mulch or by accelerating the establishment of permanent vegetation.
- E. Mechanically retarding the rate of runoff from the construction site and control disposal of runoff.
- F. Trapping all sediment resulting from construction in temporary or permanent debris basins.
- G. Using temporary measures to keep erosion under control if construction is suspended for any appreciable length of time.
- H. Providing protection against chemical, fuel, or lubricant spills, and sewage pollutants.
- I. Protecting project and existing structures from surface water damage due to utility line excavations.
- J. Controlling soil erosion and sedimentation by use of silt fences, dikes, ditches, slope protection, sediment pits, basins, dams, slope drains, coarse aggregate, mulches, sod, grasses, filter fabrics, and other erosion control devices or methods.

1.2 RELATED SECTIONS

- A. Section 013319 – Field Testing Requirements
- B. Section 310000 – Earthwork
- C. Cuyahoga County Department of Public Works “Uniform Standards for Sewage Improvements” dated 2019.

1.3 SUBMITTALS

- A. Product Data
 - 1. Filter fabric
 - 2. Filter sock
 - 3. Silt fence
 - 4. Inlet protection devices
- B. Shop Drawings
- C. Samples of materials
- D. Quality Control Submittals
 - 1. Design Data
 - 2. Test Reports
 - 3. Certificates
 - a. Seed
 - b. Fertilizer
 - c. Limestone
 - 4. Manufacturers Instructions
- E. Contract Closeout Submittals
 - 1. Project Record Documents

1.4 QUALITY ASSURANCE

- A. Qualifications - Work shall be performed by personal meeting requirements identified in section 014323 – Qualifications of Tradesmen.
- B. Field Testing – All seed mixtures shall be certified mixtures or tested to ensure they meet the requirements detailed in this section of the plans.
- C. Pre-Construction Meeting – The Contractor, Engineer, and Owner shall meet at a minimum ten (10) business days prior to the mobilization of equipment and materials to the project site. A plan for implementation of erosion control devices, during and immediately after construction activities shall be provided prior to this meeting. No work shall commence until a pre-construction meeting is held and the work plan by the Contractor is approved by the Engineer.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping
 - 1. Deliver grass seed, fertilizer and limestone in original containers labeled with content analysis.
- B. Acceptance at Site
 - 1. All material and all equipment shall be subject to visual inspection and acceptance or rejection after delivery to the site of the work. All rejected material shall immediately be removed from the site.

1.6 PROJECT CONDITIONS

- A. Environmental Requirements – temporary and permanent erosion control measures shall be installed such that meet all weather, temperature, and humidity requirements set forth by the manufacturer.
- B. Existing Conditions – The Contractor is responsible to review and verify existing conditions of the project site(s) for the necessary erosion control and seeding requirements anticipated for their work.

1.7 SEQUENCING AND SCHEDULING

- A. All temporary control measures as shown on the Drawings, called for in these Specifications or ordered by the Engineer shall remain in effect during the life of the contract to control soil erosion, sedimentation and water pollution.

1.8 MAINTENANCE

- A. The contractor is responsible to ensure that all measures remain in place for the entire duration of construction. Any item unintentionally damaged, removed, or dislodged is the responsibility of the Contractor to immediately reinstall as intended. This shall be done at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 SEED

- A. Provide fresh, clean, new crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America.
- B. All areas of temporary seeding shall be seeded with grass as shown in the following table:

March 1 - August 15	Per 1000	
	Square Feet	Per Acre
Oats	3 lbs.	4 bu.
Perennial Ryegrass	1 lb.	40 lbs.
Tall Fescue	1 lb.	40 lbs.

August 16 - November 1*	Per 1000	
	Square Feet	Per Acre
Rye	3 lbs.	2 bu.
Wheat	3 lbs.	2 bu.
Perennial Ryegrass	1 lb.	40 lbs.
Tall Fescue	1 lb.	40 lbs.

* After November 1, use mulch only

2.2 ORGANIC MULCH

- A. Select mulch material based on site requirements, availability of materials and availability of labor and equipment. The following are the minimum rates:

Rates			
Mulch	Per Acre	Per 1000 ft ²	Notes
Straw (temporary only)	2 tons	90 lbs.	Free from weeds and coarse matter. Must be anchored. Spread with mulch blower or by hand.
Wood Chips (permanent or temporary)	400 yds. ³	9 - 10 yds. ³	Apply approx. 3" deep. Treat with 12 lbs. of nitrogen per ton. Do not use on firm turf areas. Apply with mulch blower, chip handler, or by hand.
Bark Chips or Shredded Bark (temporary mulch only)	70 yds. ³	1½ - 2 yds. ³	Do not use in fine turf areas. Apply about ½" thick. Apply with a mulch blower or by hand.

2.3 FERTILIZER

- A. All fertilizer shall be manufactured from cured stock and organic sources. Chemical elements shall be accurately proportioned, uniformly mixed, and delivered to the site in factory-sealed containers fully labeled, bearing the name or trademark and warranty of the manufacturer. Commercial fertilizer for lawn sodding shall be dry or liquid compounds of 12-12- 12 analysis, meeting applicable requirements of State and Federal laws.

2.4 LIMESTONE

- A. All limestone shall be ground agricultural grade dolomitic limestone containing at least 10 percent magnesium oxide with a minimum total neutralizing power of 90, with at least 40 percent passing a No. 100 sieve and at least 95 percent passing a No. 8 sieve.

2.5 WATER

- A. All irrigation water shall be clean and free from injurious amounts of oil, acid, alkali, or other deleterious substances.

2.6 DITCH CHECKS

- A. Temporary ditch checks shall consist of coarse aggregate dikes.

2.7 INLET FILTERS

- A. Temporary inlet filters and silt fences shall be adequately supported as detailed on the drawings.

2.8 SLOPE DRAINS

- A. Temporary slope drains shall consist of pipe, coarse aggregate, riprap, rock channel protection, mats, plastic sheets or other materials approved by the Engineer. Sediment pits may be included as part of slope drain protection.

2.9 FILTER FABRIC

- A. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

Physical Property	Requirements
Filtering Efficiency	75% (min.)

Tensile Strength at Extra Strength -
20% (max.) Elongation 50 lbs./lin. in. (min.)
*

Standard Strength - 30 lbs./lin.
in. (min.)

Flow Rate 0.3 gal./sq.ft./min. (min.)

*Requirements reduced by 50 percent after 6 months of installation.

- B. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0° F to 120° F.

2.10 BURLAP

- A. Burlap shall be 10 ounce per square yard fabric.

2.11 FILTER SUPPORTS AND REINFORCING

- A. Posts for silt fences shall be either 4" diameter wood or 1.33 pounds per linear foot steel with a minimum length of 5 feet. Steel posts shall have projections for fastening wire to them.
- B. Stakes for filter barriers shall be 1" x 2" wood (preferred) or equivalent metal with a minimum length of 3 feet.

- C. Wire fence reinforcement for silt fences using standard strength filter cloth shall be a minimum of 42 inches in height, a minimum of 14 gauge and shall have a maximum mesh spacing of 6 inches.

PART 3 - EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

- A. The Contractor shall limit the surface area of erodible earth material exposed by clearing and grubbing; the surface area of erodible earth material exposed by excavation; borrow; and fill operations; and provide immediate permanent or temporary control measures to prevent contamination of adjacent streams or other areas of water impoundment. Such work will involve the construction of temporary ditch checks, filters, benches, dikes, slope drains, and use of temporary mulches, mats, seeding or other control devices or methods necessary to control erosion and sedimentation.
- B. The Contractor shall incorporate all permanent erosion control features into the Work at the earliest practicable time. Except where future construction operations will damage slopes, the Contractor shall 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. This will require the establishing of final grades as shown on the Drawings and application of agricultural limestone, commercial fertilizer, seeding and mulching or sodding . When directed by the Engineer, temporary fertilizer, seeding and mulching materials shall be used. In general, the Contractor shall temporarily seed all disturbed areas within seven (7) days if they are to remain dormant for more than forty- five (45) days. Permanent soil stabilization shall be applied to disturbed areas within seven (7) days after final grade is reached on any portion of the site.. Temporary control measures will be used when and as directed by the Engineer to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of permanent control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.
- C. Where erosion is likely to be a problem, clearing and grubbing operations should be so scheduled and performed that grading operations and permanent erosion control features can follow immediately thereafter if the project conditions permit; otherwise temporary erosion control measures will be required between successive construction stages.
- D. The Engineer will limit the area of excavation, borrow and embankment operations in progress commensurate with the Contractor's capability and progress in keeping the finished grading, mulching, seeding, and other such permanent control measures current in accordance with the accepted schedule. Mulching, seeding, and other such permanent control measures shall be applied after completion of a vertical eight (8) feet of embankment or cut, unless otherwise directed by the Engineer.

Should seasonal limitations or embankment make such coordination unrealistic, temporary erosion control measures shall be taken immediately.

- E. The Engineer may increase or decrease the allowable amount of surface area or erodible earth material to be exposed at one time by clearing and grubbing, excavation, borrow and fill operations as determined by his analysis of project conditions. Factors such as soil erodibility, slope, cut or fill height, exposed area contributing to a watercourse and weather will be considered in this determination.
- F. In the event of conflict between these requirements and pollution control laws, rules, or regulations or other Federal, State or local agencies, the more restrictive laws, rules or regulations shall apply.
- G. Temporary seeding areas shall be fertilized at a rate of 12-15 pounds per 1000 square feet of 10-10-10 or 12-12-12 analysis or equal.
- H. When directed by the Engineer, the seed bed shall be thoroughly watered to maintain adequate moisture in the upper four (4) inches of soil, necessary to promote proper root growth.
- I. When directed by the Engineer, temporary seeded areas shall be mowed when grass exceeds four (4) inches in height.
- J. Temporary erosion control features shall be acceptably maintained and shall subsequently be removed or replaced when directed by the Engineer.
- K. Removed materials shall become the property of the Contractor and shall be disposed of off the site at the Contractor's expense.

3.2 PERFORMANCE

- A. If, in the opinion of the Engineer and Owner, proper control of soil erosion and sedimentation is not being provided by the Contractor, the Owner may take all necessary steps to provide corrective measures and the cost of such services will be deducted from any money which may be due or become due the Contractor.
- B. Control work performed for protection of construction areas outside the construction site, such as borrow and waste areas, haul roads, equipment and material storage sites, and temporary plant sites shall be considered as a subsidiary obligation of the Contractor, with all necessary control costs included in the contract price.
- C. In the event that temporary erosion and sediment control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled, and are ordered by the Engineer, such temporary work shall be performed by the Contractor at his expense.

3.3 SILT FENCE

- A. The height of a silt fence shall not exceed 36 inches (higher fences may impound volumes of water sufficient to cause failure of the structure).
- B. The filter fabric shall be purchased in a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are necessary, filter cloth shall be spliced together only at a support post, with a minimum six (6) inches overlap and securely sealed.
- C. Posts shall be spaced a maximum of ten (10) feet apart at the barrier location and driven securely into the ground (minimum of 12 inches). When extra strength fabric is used without the wire support fence, post spacing shall not exceed six (6) feet.
- D. A trench shall be excavated approximately four (4) inches wide and four (4) inches deep along the line of posts and upslope from the barrier.
- E. When standard strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least one (1) inch long, tie wires or hog rings. The wire shall extend into the trench a minimum of two (2) inches and shall not extend more than 36 inches above the original ground surface.
- F. The standard strength filter fabric shall be stapled or wired to the fence, and eight (8) inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.
- G. When extra strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of Subparagraph F above applying.
- H. The trench shall be backfilled and soil compacted over the filter fabric.
- I. Silt fences shall be removed when they have served their purpose, but not before the upslope area has been permanently stabilized.
- J. Silt fences and filter barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately.
- K. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier is still necessary, the fabric shall be replaced promptly.
- L. Sediment deposits should be removed after each storm event. They must be removed when deposits reach approximately one-half the height of the barrier.

- M. Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform with the existing grade, prepared and seeded.

3.4 TEMPORARY MULCHING

A. Application

- 1. Mulch materials shall be spread uniformly, by hand or machine.
 - a. When spreading straw mulch by hand, divide the areas to be mulched into approx. 1000 sq. ft. sections and place approx. 90 lbs. of straw in each section to facilitate uniform distribution.

B. Mulch Anchoring

- 1. Straw mulch shall be anchored immediately after spreading to prevent windblow. One of the following methods of anchoring straw shall be used:
 - a. Mulch anchoring tool
 - 1. This is a tractor-drawn implement (mulch crimper, serrated straight disk or dull farm disk) designed to punch mulch approximately two(2) inches into the soil surface. This method provides maximum erosion control with straw. It is limited to use on slopes no steeper than 3:1, where equipment can operate safely. Machinery shall be operated on the contour.
 - b. Liquid mulch binders
 - 1. Application of liquid mulch binders and tackifiers should be heaviest at edges of areas and at crests of ridges and banks, to prevent windblow. The remainder of the area should have binder applied uniformly. Binders may be applied after mulch is spread; however, it is recommended to be sprayed into the mulch as it is being blown onto the soil. Applying straw and binder together is the most effective method.
 - 2. The following type of binder may be used:
 - a.) Asphalt - any type of asphalt thin enough to be blown from spray equipment is satisfactory. Recommended for use are rapid curing (RC-80, RC-250, RC-800), medium curing (MC-250, MC-800) and emulsified asphalt (SS-1, MS-2, RS-1 and RS-2). Apply asphalt at 4 gal./1000 ft.², 600 gal./acre. Do not use heavier applications as it may cause the straw to "perch" over rills.
 - b.) Wood Fiber - wood fiber hydroseeder slurries may be used to tack straw mulch.
 - c. Mulch nettings
 - 1. Lightweight plastic, cotton or paper nets may be stapled over the mulch according to manufacturer's recommendations.

C. Chemical Mulches

- 1. Chemical mulches may be used alone only in the following situations:
 - a. Where no other mulching material is available.

- b. In conjunction with temporary seeding during the times when mulch is not required for that practice.
2. Chemical mulches may be used to bind other mulches or with wood fiber in a hydroseeded slurry at any time. Manufacturer's recommendations for application of chemical mulches shall be followed.

D. Nets and Mats

1. Nets may be used alone on level areas, on slopes no steeper than 3:1, and in waterways.
2. When mulching is done in late fall or during June, July and August, or where soil is highly erodible, net should only be used in conjunction with an organic mulch such as straw.
3. When net and organic mulch are used together, the net should be installed over the mulch except when the mulch is wood fiber. Wood fiber may be sprayed on top of the installed net.
4. Excelsior blankets are considered protective mulches and may be used alone on erodible soils and during all times of the year.
5. Other products designed to control erosion shall conform to manufacturer's specification and should be applied in accordance with manufacturer's instructions provided those instructions are at least as stringent as this specification.
6. Staples will be made of plain iron wire, No. 8 gauge or heavier, and will be six (6) inches or more in length.
7. Prior to installation:
 - a. Shape and grade as required the waterway, channel, slope or other area to be protected.
 - b. Remove all rocks, clods or debris larger than two (2) inches in diameter that will prevent contact between the net and the soil surface.
 - c. When open-weave nets are used, lime, fertilizer and seed may be applied either before or after laying the net. When excelsior matting is used, they must be applied before the mat is laid.
8. Laying the Net:
 - a. Start laying the net from top of channel or top of slope and unroll down-grade.
 - b. Allow to lay loosely on soil - do not stretch.
 - c. To secure net: Upslope ends of net should be buried in a slot or trench no less than six (6) inches deep. Tamp earth firmly over net. Staple the net every twelve (12) inches across the top end.
 - d. Edges of net shall be stapled every three (3) feet. Where two strips of net are laid side by side, the adjacent edges shall be overlapped three (3) inches and stapled together.
 - e. Staples shall be placed down the center of net strips at 3-foot intervals. Do not stretch net when applying staples.
9. Joining strips
 - a. Insert new roll of net in trench, as with upslope ends of net. Overlap the end of the previous roll eighteen (18) inches, turn under six (6) inches and staple across end of roll just below anchor slot and at the end of the turned-under net every twelve (12) inches.

10. At bottom of slopes
 - a. Lead net out onto a level area before anchoring. Turn ends under six (6) inches and staple across end every twelve (12) inches.
11. Check slots
 - a. On highly erodible soils and on slopes steeper than 4:1, erosion check slots should be made every fifteen (15) feet. Insert a fold of net into a six (6) inch trench and tamp firmly. Staple at twelve (12) inch intervals across the downstream portion of the net.
12. Rolling
 - a. After installation, stapling and seeding, net should be rolled to ensure firm contact between net and soil.
13. All mulches should be inspected periodically, in particular after rainstorms, to check for rill erosion. Where erosion is observed, additional mulch should be applied. Net should be inspected after rainstorms for dislocation or failure. If washouts or breakage occur, re- install net as necessary after repairing damage to the slope. Inspections should take place up until grasses are firmly established. Where mulch is used in conjunction with ornamental plantings, inspect periodically throughout the year to determine if mulch is maintaining coverage of the soil surface; repair as needed.

3.5 TEMPORARY SEEDING

A. Site Preparation

1. Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation, seeding, mulch application and anchoring.
2. Install the needed erosion control practices prior to seeding such as diversions, temporary waterways for diversion outlets and sediment basins.

B. Seedbed Preparation

1. Lime (in lieu of a soil test recommendation) shall be applied on acid soil (pH 5.5 or lower) and subsoil at a rate of 100 pounds per 1000 square feet or two tons per acre of agricultural ground limestone. For best results, make a soil test.
2. Fertilizer (in lieu of a soil test recommendation) shall be applied at a rate of 12-15 pounds per 1000 square feet or 500-600 pounds per acre of 10-10-10 or 12-12-12 analysis or equivalent.
3. Work the lime and fertilizer into the soil with a disk harrow, springtooth harrow or similar tools to as depth of two inches. On sloping areas, the final operation shall be on the contour.

C. Seeding

1. Apply the seed uniformly with a cyclone seeder, drill, cultipacker seeder or hydroseeder (slurry may include seed and fertilizer) preferably on a firm, moist seedbed. Seed wheat or rye no deeper than one (1) inch. Seed ryegrass no deeper than one-fourth ($\frac{1}{4}$) inch.
2. When feasible, except where a cultipacker type seeder is used, the seedbed should be firmed following seeding operations with a cultipacker, roller or light drag. On sloping land, seeding operations should be on the contour wherever possible.

- D. Mulching
1. Mulch shall be applied to protect the soil and provide a better environment for plant growth.
 2. Mulch shall consist of small grain straw (preferably wheat or rye) and shall be applied at the rate of two tons per acre or 100 pounds (two to three bales) per 1000 square feet.
 3. Spread the mulch uniformly by hand or mechanically so the soil surface is covered.
 4. Mulch Anchoring Methods
 - a. Mechanical - use a disk, crimper or similar type tool set straight to punch or anchor the mulch material into the soil.
 - b. Asphalt Emulsion - apply at the rate of 160 gallons per acre into the mulch as it is being applied.
 - c. Mulch Nettings - use according to the manufacturer's recommendations. Use in areas of water concentration to hold mulch in place.
- E. Irrigation
1. If soil moisture is deficient, supply new seedlings with adequate water for plant growth until they are firmly established. This is especially true when seedlings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

END OF SECTION 015713

SECTION 015800 - PROJECT IDENTIFICATION

PART 1 - GENERAL

1.1 PROJECT SIGN

- A. The Contractor shall be responsible for constructing, installing, maintaining and removing all project signs.
- B. The Contractor shall be responsible for obtaining all permits for project signs from any local authority having jurisdiction including the payment of fees, if any.
- C. The contractor shall install one project sign at a location to be determined by the Owner. The sign shall contain all of the data and graphics depicted on the attached exhibit SD-6-16 C.
- D. See Bid Book Section 9, Special Requirements – EPA, Signage pages SR.EPA.45 to 48.

END OF SECTION 015800

SECTION 016600 - PRODUCT HANDLING AND PROTECTION

PART 1 - GENERAL

1.1 DELIVERY AND STORAGE OF MATERIALS

- A. The Contractor shall be responsible for delivery and storage of all materials.
- B. The Contractor shall coordinate with the Engineer on the arrangement for storing construction materials and equipment. Deliveries of all construction materials and equipment should be made at suitable times.
- C. The Contractor shall store all materials required for the performance of this contract at sites designated by the Engineer.
- D. All stockpiles shall be neat, compact, completely safe, and barricaded with warning lights if necessary.
- E. Precautions shall be taken so that no shade trees, shrubs, flowers, sidewalks, driveways or other facilities will be damaged by the storage of materials. The Contractor shall be responsible for the restoration of all stockpile sites to their original condition.
- F. Materials, tools and machinery shall not be piled or placed against shade trees, unless they shall be amply protected against injury therefrom. All materials, tools, machinery, etc. stored upon public thoroughfares must be provided with red lights at night time so as to warn the traffic of such obstruction.
- G. Materials shall be so stored as to assure the preservation of their quality and fitness for the work. Stored materials, even though approved before storage, shall again be inspected prior to their use in the work. Stored materials shall be located so as to facilitate their prompt inspection. Approved portions of the construction site may be used for storage purposes and for the placing of the Contractor's plant and equipment, but any additional space required therefore must be provided by the Contractor at his expense. Private property shall not be used for storage purposes without written permission of the property owner or lessee, and copies of such written permission shall be furnished the Engineer. All storage sites shall be restored to their original condition by the Contractor at his expense.

END OF SECTION 016600

SECTION 017839 - PROJECT RECORDS, DRAWINGS

PART 1 - GENERAL

1.1 RECORD DRAWINGS

- A. The Contractor shall furnish an authentic set of marked-up drawings showing the installation insofar as the installation shall have differed from the Engineer's drawings. The drawings shall be delivered to the Engineer for making revisions to the original drawings immediately after final acceptance by the Owner. This shall include redline markups noting exact locations of structures, sewers, elevations, slopes and lengths, and any other changes from the existing or proposed conditions detailed in the original drawings.
- B. The Contractor shall furnish dimensioned drawings indicating locations of all underground mechanical and electrical facilities.

1.2 SERVICE CONNECTION RECORDS

- A. The Contractor shall record the location of all service and property connections, new or existing, made to utilities constructed under this contract. Such records shall be turned over to the Owner upon completion of the work. The cost of making such records shall be included in the various unit or lump sum prices stipulated for the various items of the work.
- B. The location of each sewer connection as measured along the sewer from the nearest downstream manhole and its description with respect to the sewer shall be recorded. The record shall include the depth of new stubs for future connections and the depth of existing connections as measured from the surface grade. Also, the use of any vertical riser pipe shall be noted.
- C. The location of each water connection as measured along the water line from the nearest fire hydrant.

END OF SECTION 017839

SECTION 030000 - CONCRETE WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
 - 1. Section 013319 – Field Testing Requirements

1.2 SUMMARY

- A. This Section specifies cast-in place concrete, including form work, reinforcing, mix design, placement procedures and finishes.
 - 1. Extent of concrete work is shown on drawings.
 - 2. Concrete paving and walks are specified in Division 2.
 - 3. Precast concrete is specified in other Division-3 sections.
 - 4. Mechanical finishes and concrete floor toppings are specified in other Division-3 sections.

1.3 SUBMITTALS

- A. Product Data: Submit data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials, and others as requested by Engineer.
- B. Shop Drawings; Reinforcement: Submit original shop drawings prepared for fabrication, bending, and placement of concrete reinforcement. Comply with ACI Detailing Manual showing bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures.
- C. Shop Drawings; Form work: Submit shop drawings prepared by a registered Professional Engineer for fabrication and erection of forms for specific finished concrete surfaces. Show form construction including jointing, special form joint or reveals, location and pattern of form tie placement, and other items which affect exposed concrete visually.
 - 1. Engineer's review is for general architectural applications and features only. Design of form work for structural stability and efficiency is Contractor's responsibility.
- D. Samples: Submit samples of materials as requested by Engineer, including names, sources, and descriptions.
- E. Laboratory Test Reports: Submit laboratory test reports for concrete materials and mix design tests.

1. The proposed mix design submittal(s) shall follow the procedures of Chapter 5, Sections 5.2 to 5.3 of ACI-318.
 2. Reference should be made to ACI-211.5R "Guide for Submittal of Concrete Proportions" for the required submittal information. Sample forms for presenting the necessary information can be found in the addendum at the end of this section. Example Form B should follow a completed Example A in the submittal when laboratory trial batches are used to document a water-cementitious materials ratio curve.
 3. Additional data summarizing the past performance records should be an integral part of the submittal if the submittal is based on past performance with the proposed materials and proportions.
- F. Materials Certificates: Provide materials certificates in lieu of materials laboratory test reports when permitted by Engineer. Materials certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with, or exceeds, specified requirements. Provide certification from admixture manufacturers that chloride content complies with specification requirements.

1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following codes, specifications, and standards, latest revisions, except where more stringent requirements are shown or specified:
1. ACI 301 "Specifications for Structural Concrete for Buildings."
 2. ACI 318 "Building Code Requirements for Reinforced Concrete."
 3. Concrete Reinforcing Steel Institute (CRSI), "Manual of Standard Practice."
 4. ACI 347 "Guide to Form work for Concrete."
 5. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- B. Materials and installed work may require testing and retesting at anytime during progress of work. Tests, including retesting of rejected materials for installed work, shall be done at Contractor's expense.
- C. Engage a testing agency acceptable to Engineer to perform initial material evaluation and certification tests for mix designs and to design concrete mixes.

1.5 PROJECT CONDITIONS

- A. Protection of Footings Against Freezing: Cover completed work at footing level with sufficient temporary or permanent cover as required to protect footings and adjacent subgrade against possibility of freezing; maintain cover for time period as necessary.
- B. Protect adjacent finish materials against spatter during concrete placement.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: 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 on drawings.
 - 1. Use plywood complying with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood," Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.
- B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least two (2) edges and one side for tight fit.
- C. Forms for Textured Finish Concrete: Units of face design, size, arrangement, and configuration to match Engineer's control sample. Provide solid backing and form supports to ensure stability of textured form liners.
- D. Forms for Cylindrical Columns and Supports: Metal, fiberglass reinforced plastic, or paper or fiber tubes. Construct paper or fiber tubes of laminated plies using water-resistant adhesive with wax-impregnated exterior for weather and moisture protection. Provide units with sufficient wall thickness to resist loads imposed by wet concrete without deformation.
- E. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.
- F. Form Ties: Factory-fabricated, adjustable-length, snapoff metal or glass fiber-reinforced plastic form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units which will leave no metal closer than 1-1/2" to the exposed surface.
 - 1. Provide ties which, when removed, will leave holes not larger than 1" diameter in concrete surface.
 - 2. All form ties shall have a factor of safety of two (2) to determine the recommended safe working load.

2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
- B. Galvanized Reinforcing Bars: ASTM A 767, Class II (2.0 oz. zinc psf) hot-dip galvanized, after fabrication and bending.
- C. Epoxy-Coated Reinforcing Bars: ASTM A 775.
 - 1. Repair of damaged epoxy-coating - When required, damaged epoxy-coating shall be repaired with patching material conforming to ASTM A 775. Repair shall be done in accordance with the patching material manufacturer's recommendations.

- D. Steel Wire: ASTM A 82, plain, cold-drawn steel.
- E. Welded Wire Fabric: ASTM A 185, welded steel wire fabric. (Flat sheets only)
- F. Welded Deformed Steel Wire Fabric: ASTM A 497.
- G. Epoxy - Coated Welded Wire Fabric: ASTM A884, Class A.
- H. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications.
 - 1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
 - 2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I, II or I/II and ASTM C595M, Type IP, unless otherwise specified. (See Table I, Concrete Requirements).
 - 1. Use one brand of cement throughout project, unless otherwise acceptable to Engineer.
- B. Fly Ash: ASTM C 618, Class F or Slag Cement: ASTM C989
 - 1. Limit use of fly ash to not exceed 25% of cement content by weight.
- C. Ground Granulated Blast-Furnace Slag: ASTM C989, Grade 100 or 120.
 - 1. Limit use of granulated blast-furnace slag to not exceed 30% of cement content by weight.
- D. Normal Weight Aggregates: ASTM C 33, and as herein specified. Provide aggregates from a single source for exposed concrete, with nominal maximum aggregate size of 1 inch.
 - 1. For exterior exposed surfaces, do not use fine or coarse aggregates containing spalling-causing deleterious substances.
 - 2. Local aggregates not complying with ASTM C 33, but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to Engineer.
 - 3. Combined Aggregate Gradation: Well graded from coarsest to finest with not more than 18 percent and not less than 8 percent retained on an individual sieve, except that less than 8 percent may be retained on coarsest sieve and on No. 50 (0.3-mm) sieve, and less than 8 percent may be retained on sieves finer than No. 50 (0.3 mm).

E. Lightweight Aggregates: ASTM C 330.

Maximum nominal aggregate size of 1 inch.

F. Water: Drinkable and complying with ASTM C94.

G. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. "Air-Mix"; Euclid Chemical Co.
- b. "Sika Aer"; Sika Corp.
- c. "MB-VR or MB-AE"; Master Builders.

H. Water-Reducing Admixture: ASTM C 494, Type A, and containing not more than 0.1 percent chloride ions.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. "WRDA"; W.R. Grace.
- b. "Eucon WR-75"; Euclid Chemical Co.
- c. "Pozzolith Normal"; Master Builders.

I. High-Range Water-Reducing Admixture (Super Plasticizer): ASTM C 494, Type F and containing not more than 0.1 percent chloride ions. Required for use in Class A & D per section 2.3 (F).

1. Products: Subject to compliance with requirements, provide one of the following:

- a. "Sikament 300"; Sika Chemical Corp.
- b. "Eucon 37"; Euclid Chemical Co.
- c. "Rheobuild or Polyheed"; Master Builders.

J. Water-Reducing, Non-Chloride Accelerator Admixture: ASTM C 494, Type E, and containing not more than 0.1 percent chloride ions.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. "Accelguard 80"; Euclid Chemical Co.
- b. "Pozzutec 20"; Master Builders.
- c. "Daraset"; W.R. Grace & Co.

K. Water-Reducing, Retarding Admixture: ASTM C 494, Type D, and containing not more than 0.1 percent chloride ions.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. "Pozzolith"; Master Builders.
- b. "Eucon Retarder 75"; Euclid Chemical Co.

- c. "Plastiment"; Sika Chemical Co.
- L. Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Catexol 1000CL; Axim Concrete Technologies.
 - b. MCI 2000 or MCI 2005; Cortec Corporation.
 - c. DCI or DCI-S; W.R. Grace & Co., Construction Products Div.
 - d. Rheocrete 222+; Master Builders, Inc.
 - e. FerroGard-901; Sika Corporation.
- M. Prohibited Admixtures: Calcium chloride thiocyanates or admixtures containing more than 0.1 percent chloride ions are not permitted.
- N. Fiber Reinforcement:
 - 1. Synthetic fiber reinforcing shall be added to the concrete for the areas so indicated in the drawings. Only fibers designed and manufactured specifically for use in concrete shall be acceptable as secondary reinforcement, complying with ASTM C1116, not less than 3/4 inch long.
 - 2. The fibers may be added at the batch plant. The incorporation of said fibers shall be documented on the delivery ticket from the ready mix producer. Fibers shall be added to the concrete in strict accordance with manufacturer's printed instructions. The minimum dosage rate shall be 1.5 lbs/cubic yard.
 - 3. Nylon fibers containing 100% virgin nylon monofilaments shall be utilized to impart a "non-hairy" surface to the finished concrete.
 - 4. Products: Subject to compliance with requirements, provide the following fibrous reinforcement or approved equal:
 - a. Nycon Fiber; Nycon, Inc.
 - b. Nylo-Mono; Forta Corp.
 - c. Fibrasol N; Axim Concrete Technologies

2.4 RELATED MATERIALS

- A. Reglet's: Where resilient or elastomeric sheet flashing or bituminous membranes are terminated in reglets, provide reglets of not less than 26 gage galvanized sheet steel. Fill reglet or cover face opening to prevent intrusion of concrete or debris.
- B. Waterstops: Provide waterstops at construction joints and other joints as indicated and specified in Section 030000.02.
- C. Granular Base: Evenly graded mixture of fine and coarse aggregates to provide, when compacted, a smooth and even surface below slabs on grade.

- D. Vapor Retarder: Provide vapor retarder cover, ASTM E1745 Class C, over prepared base material where indicated below slabs on grade. Use only materials which are resistant to deterioration when tested in accordance with ASTM E 154, as follows:
1. Polyethylene sheet not less than 10 mils thick.
 2. Water resistant barrier paper consisting of heavy Kraft papers laminated together with glass fiber reinforcement and over-coated with black polyethylene on each side.
 - a. Product: Subject to compliance with requirements, provide Moistop Ultra 10 by Fortifiber Corporation, Stego Wrap 10-mil by Stego Industries or equal.
- E. Non-Shrink Grout: CRD-C 621 and ASTM C-1107, factory pre-mixed grout.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Non-metallic
 - 1) "Set Grout"; Master Builders.
 - 2) "Euco-NS"; Euclid Chemical Co.
 - 3) "Five Star Grout"; U.S. Grout Corp.
- F. Non-slip Aggregate Finish: Provide fused aluminum oxide grits, or crushed emery, as abrasive aggregate for non-slip finish with emery aggregate containing not less than 50 percent aluminum oxide and not less than 25 percent ferric oxide. Use material that is factory-graded, packaged, rust-proof, and non-glazing, and is unaffected by freezing, moisture, and cleaning materials.
- G. Colored Wear-Resistant Finish: Packaged, dry, combination of materials, consisting of Portland cement, graded quartz aggregate, coloring pigments, and plasticizing admixture. Use coloring pigments that are finely ground, non-fading mineral oxides, interground with cement. Color as selected by Engineer, unless otherwise indicated.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. "Colorcron"; Master Builders.
 - b. "Surflex"; Euclid Chemical Co.
 - c. "Lithochrome"; L.M. Scofield Co.
- H. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., 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. Liquid Membrane-Forming Curing Compound: Liquid type membrane- forming curing compound complying with ASTM C 309, Type I, Class A. Moisture loss not more than 0.55 kg./sq. m. when applied at 200 sq ft./gal.

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. "Masterkure"; Master Builders.
 - b. "Ecocure"; Euclid Chemical Co.
 - c. "Horn Clear Seal"; A.C. Horn, Inc.
- K. Underlayment Compound: Freeflowing, self-leveling, pumpable cementitious base compound for applications from 1 inch thick to feathered edges.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. "Flo-Top"; Euclid Chemical Co.
 - b. "Underlayment 110," Master Builders, Inc.
 - c. "Thoro Underlayment Self-Leveling"; Thoro System Products.
- L. Bonding Compound: Polyvinyl acetate or acrylic base.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Polyvinyl Acetate (Interior Only):
 - 1) "Euco Weld"; Euclid Chemical Co.
 - 2) "Weldcrete"; Larsen Products Corp.
 - 3) "Everweld"; L&M Construction Chemicals, Inc.
 - b. Acrylic or Styrene Butadiene:
 - 1) "Day-Chem AD Bond"; Dayton Superior Corp.
 - 2) "Everbond"; L & M Construction Chemicals.
 - 3) "SBR Latex"; Euclid Chemical Co.
- M. Epoxy Adhesive: ASTM C 881, two component material suitable for use on dry or damp surfaces. Provide material "Type," "Grade," and "Class" to suit project requirements.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. "Epoxite Binder 2390"; A.C. Horn, Inc.
 - b. "Sikadur 32 Hi-Mod"; Sika Chemical Corp.
 - c. "Euco Epoxy 452 or 620"; Euclid Chemical Co.

2.5 PROPORTIONING AND DESIGN OF MIXES

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301 and ACI 211. If the trial batch method is used, use an independent testing facility acceptable to Engineer for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to Engineer.
 1. Limit use of fly ash to not exceed 25 percent of cement content by weight.

- B. Submit written reports to Engineer and Structural Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Engineer.
- C. Design mixes to provide normal weight concrete with the following properties, as indicated in Table I.:

TABLE 1

CONCRETE REQUIREMENTS

Concrete Class	Cement Type	Min. 28-Day Compressive Strength PSI	*Max. Water-Cement Ratio	Min. Cement Content Sacks	Slump Min.	Inch Max.	Entrained Air %
A	I	4000	0.45	6	-	-	6±1
B	I	2000	0.74	4-1/2	2	6	5±1-1/2
C	I	4000	0.50	6.38	1	4	6±2
D	II or IP	4000	0.45	6	-	-	6±1

*Maximum Water - Cementitious Materials Ratio

1. All reinforced concrete shall be Class A, except as otherwise specified or shown on the drawings.
 2. Concrete used for mud mats, fill and channeling in manholes and chambers shall be Class B unless otherwise noted on the drawings.
 3. Class C concrete conforming to ODOT 499 (Class C) shall be used for all concrete pavement, curbing, driveways, and sidewalks, unless noted otherwise on the drawings.
 4. Class B concrete may be used for encasing pipelines, fill, and pipe bedding.
 5. Class B concrete shall be used as concrete fill in concrete tanks for shaping or sloping bottoms.
 - a. The following steps shall be taken for installation of the Class B concrete:
 - 1) Scrub concrete slabs and/or walls with a stiff wire brush and streams of clean water as a minimum, to remove laitance.
 - 2) Apply a bonding agent in accordance with the manufacturer's surface preparation and application recommendations.
 - 3) The Class B concrete shall then be placed and screeded to bring the surface to final grade.
 6. Class D concrete shall be used for sewerage treatment plants and sewerage pump stations, as noted on the drawings.
- D. Lightweight Concrete: Lightweight aggregate and concrete shall conform to ASTM C 330. Proportion mix to produce concrete with a minimum compressive strength of 3000 psi at 28 days and a calculated equilibrium unit weight of 110 pcf plus or minus 3 pcf as determined by ASTM C 567. Concrete slump at the point of placement shall be the minimum necessary for efficient mixing, placing, and finishing. Maximum slump shall be

6 inches for pumped concrete and 5 inches elsewhere. Air entrain concrete exposed to weather according to ACI 301 requirements.

- E. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Engineer. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Engineer before using in work.
- F. Admixtures:
 - 1. Use high range water-reducing admixture (super plasticizer) in Classes A and D concrete unless noted otherwise.
 - 2. Use non-chloride accelerating admixture in concrete slabs placed at ambient temperatures below 50 deg F (10 deg C).
 - 3. Use air-entraining admixture in all concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content within limits shown in Table I.
 - 4. Use admixtures for water-reducing and set-control in strict compliance with manufacturer's directions.
 - 5. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as shown in Table I:
 - a. Concrete containing HRWR admixture (super-plasticizer): Not more than 8" after addition of HRWR to site-verified 2"-3" slump concrete.

2.6 CONCRETE MIXING

- A. Job-Site Mixing: Mix materials for concrete in appropriate drum type batch machine mixer. For mixers of one cu. yd., or smaller capacity, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released. For mixers of capacity larger than one cu. yd., increase minimum 1-1/2 minutes of mixing time by 15 seconds for each additional cu. yd., or fraction thereof.
 - 1. Provide batch ticket for each batch discharged and used in work, indicating project identification name and number, date, mix type, mix time, quantity, and amount of water introduced.
- B. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as herein specified.
 - 1. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.
 - a. When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 GENERAL

- A. Coordinate the installation of joint materials and vapor retarders with placement of forms and reinforcing steel.

3.2 FORMS

- B. Design, erect, support, brace, and maintain form work to support vertical and lateral, static, and dynamic loads that might be applied until such loads can be supported by concrete structure. Construct form work so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain form work construction tolerances complying with ACI 347.
- C. Design form work to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent materials.
- D. Construct forms to sizes, shapes, lines, 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 back-up at joints to prevent leakage of cement paste.
- E. 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, to prevent swelling and for easy removal.
- F. Provide temporary openings where interior area of form work 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 on forms at inconspicuous locations.
- G. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- H. Provisions for Other Trades: Provide openings in concrete form work 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.
- I. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before concrete is placed. Retightening forms and bracing after concrete placement if required to eliminate mortar leaks and maintain proper alignment.

3.3 VAPOR RETARDER INSTALLATION

- A. Following leveling and tamping of granular base for slabs on grade, place vapor retarder sheeting with longest dimension parallel with direction of pour.
- B. Lap joints 6" and seal with manufacturer's recommended mastic or pressure-sensitive tape.

3.4 PLACING REINFORCEMENT

- A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports, and as herein specified.
 - 1. Avoiding cutting or puncturing vapor retarder during reinforcement placement and concreting operations. Repair damages before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.
- C. Accurately position, support, and secure reinforcement against displacement by form work, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.
- D. Place reinforcement to obtain at least minimum coverages for concrete protection. 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.
- E. Install welded wire fabric in longest lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.
- F. Epoxy - Coated Reinforcing Steel:
 - 1. Epoxy-coated reinforcing bars supported from form work shall rest on coated wire bar supports, or on bar supports made of dielectric material or other acceptable materials. Wire bar supports shall be coated with dielectric material for a minimum distance of 2 inches from the point of contact with the epoxy-coated reinforcing bars. Reinforcing bars used as support bars shall be epoxy-coated. In walls having epoxy-coated reinforcing bars, spreader bars where specified by the Engineer, shall be epoxy-coated. Proprietary combination bar clips and spreaders used in walls with epoxy-coated reinforcing bars shall be made of corrosion-resistant material.
 - 2. Epoxy-coated reinforcing bars - Equipment for handling epoxy-coated bars shall have protected contact areas. Bundles of coated bars shall be lifted at multiple pick-up points to minimize bar-to-bar abrasion from sags in the bundles. Coated bars or bundles of coated bars shall not be dropped or dragged. Coated bars shall be stored on protective cribbing. Fading of the color of the coating shall not be cause for rejection of epoxy-coated reinforcing bars. Coating damage due to handling,

shipment and placing need not be repaired in cases where the damaged area is 0.1 square inches or smaller. Damaged areas larger than 0.1 square inches shall be repaired in accordance with the epoxy material manufacturer's recommendations. The maximum amount of damage including repaired and unrepaired areas shall not exceed 2 percent of the surface area in each linear foot of each bar.

3.5 JOINTS

- A. 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 to Engineer.
 - 1. Provide keyways at least 1-1/2" deep in construction joints in walls, slabs, and between walls and footings; accepted bulkheads designed for this purpose may be used for slabs.
 - 2. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints, except as otherwise indicated.
- B. Waterstops: Provide waterstops in construction joints as indicated. Install waterstops to form continuous diaphragm in each joint. Make provisions to support and protect exposed waterstops during progress of work. Fabricate field joints in waterstops in accordance with manufacturer's printed instructions.
- C. Isolation Joints in Slabs-on-Ground: Construct isolation joints 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 indicated.
 - 1. Joint filler and sealant materials are specified in Section 030000.02 of these specifications.
- D. Contraction (Control) Joints in Slabs-on-Ground: Construct contraction joints in slabs-on-ground to form panels of patterns as shown. Use inserts 1/4 of slab depth, unless otherwise indicated.
 - 1. Form contraction joints by inserting premolded plastic strips into fresh concrete until top surface of strip is flush with slab surface.
 - 2. Follow the directions of Insert Manufacturer for finishing the slab and joints.
- E. If joint pattern not shown, provide joints not exceeding 15' in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third-bays).
 - 1. Joint sealant material is specified in Section 030000.02 of these specifications.

3.6 INSTALLATION OF EMBEDDED ITEMS

- A. General: Set and build into 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 suppliers of items to be attached thereto. Electrical conduit shall not be embedded in concrete.

- B. Install reglets to receive top edge of foundation sheet waterproofing, and to receive thru-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, relieving angles, and other conditions.
- C. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units to support screed strips using strike-off templates or compacting type screeds.

3.7 PREPARATION OF FORM SURFACES

- A. Clean re-used forms of concrete matrix residue, repair and patch as required to return forms to acceptable surface condition.
- B. Coat contact surfaces of forms with an approved, nonresidual, low-VOC, form-coating compound before placing reinforcement.
- C. Thin form-coating compounds only with thinning agent of type, amount, and under conditions of form-coating compound manufacturer's directions. 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.
- D. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel form work is not acceptable.

3.8 CONCRETE PLACEMENT

- A. Preplacement Inspection: Before placing concrete, inspect and complete form work installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.
 - 1. Apply temporary protective covering to lower 2' of finished walls adjacent to poured floor slabs and similar conditions, and guard against spattering during placement.
- B. General: Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete," and as herein specified.
 - 1. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.
- C. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24" 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.

1. 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.
 2. 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" 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 and complete embedment of reinforcement and other embedded items without causing segregation of mix.
- D. 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.
1. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Bring slab surfaces to correct level with straightedge and strikeoff. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
 3. Maintain reinforcing in proper position on chairs during concrete placement operations.
- E. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified.
4. When air temperature has fallen to or is expected to fall below 40 deg F (4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C), and not more than 80 deg F (27 deg C) at point of placement.
 - a. The concrete shall be maintained within this temperature range for not less than seven (7) days.
 5. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials or against cold reinforcing steel.
 6. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.
- F. 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.
7. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F (32 deg 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.

8. 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.
9. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.
10. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, as acceptable to Engineers.

3.9 FINISH OF FORMED SURFACES

- A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in height rubbed down or chipped off.
- B. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or other similar system. This is an as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed; provide smooth rubbed finish to smooth form finish. Refer to "Concrete Surface Repairs."
- C. Smooth Rubbed Finish: Provide smooth rubbed finish to scheduled concrete surfaces, which have received smooth form finish treatment.
 1. Scarify or roughen entire surface by grinding or similar effective means.
 2. Combined one part Portland cement to 1-1/2 parts fine sand by volume and a 50:50 mixture of acrylic or styrene butadiene-based bonding admixture and water to form the consistency of thick paint. Blend standard Portland cement and white Portland cement, amounts determined by trial patches, so that final color of dry grout will match adjacent surfaces.
 3. Thoroughly wet concrete surfaces and apply grout to coat surfaces and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.
 4. Repeat the above process if necessary to fill voids or bug holes and obtain a consistent match to adjacent surfaces, subject to acceptance of the Engineer.
- D. Grout Cleaned Finish: Provide grout cleaned finish on scheduled concrete surfaces which have received smooth form finish treatment.
 1. Scarify or roughen entire surface by grinding or similar effective means.
 2. Apply Thoroseal plaster mix coating by Thoro System Products or approved equivalent with an approximate thickness of 1/8-inch to 1/4-inch.
 3. Follow the manufacturer's recommendations and guidelines regarding surface preparation, application methods and curing.
 4. Repeat the above process if necessary to fill voids or bug holes and obtain a consistent match to adjacent surfaces, subject to acceptance of the Engineer.

- E. 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.

3.10 MONOLITHIC SLAB FINISHES

- A. Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds for tile, Portland cement terrazzo, and other bonded applied cementitious finish flooring material, and as otherwise indicated.
 - 1. After placing slabs, plane surface to tolerances for floor flatness F(F) 15 and floor levelness F(L) 13, measured according to ASTM E 1155. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set, with stiff brushes, brooms, or rakes.
- B. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo, and as otherwise indicated.
 - 1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or 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 F(F) 18 F(L) 15. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.
- C. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed-to-view, and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin film finish coating system.
 - 1. 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 F(F), 20 and F(L) 17, measured according to ASTM E1155. Grind smooth surface defects which would telegraph through applied floor covering system.
- D. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming.
- E. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Engineer before application.
- F. Non-slip Aggregate Finish: Apply non-slip aggregate finish to concrete stair treads, platforms, ramps, sloped walks, and elsewhere as indicated.
1. After completion of float finishing, and before starting trowel finish, uniformly spread 25 lbs. of dampened non-slip aggregate per 100 sq. ft. of surface. Tamp aggregate flush with surface using a steel trowel, but do not force below surface. After broadcasting and tamping, apply trowel finishing as herein specified.
 2. After curing, lightly work surface with a steel wire brush, or an abrasive stone, and water to expose non-slip aggregate.
- G. Colored Wear-Resistant Finish: Provide colored wear-resistant finish to monolithic slab surface indicated.
1. Apply dry shake materials for colored wear-resistant finish at rate of not less than 100 lbs. per 100 sq. ft., unless greater amount is recommended by material manufacturer.
 2. Immediately following first floating operation, uniformly distribute approximately 2/3 of required weight of dry shake material over concrete surface, and embed by means of power floating. Follow floating operation with second shake application, uniformly distributing remainder of dry shake material with overlapping applications, and embed by power floating.
 3. After completion of broadcasting and floating, apply trowel finish as herein specified. Cure slab surface with curing compound recommended by dry shake hardener manufacturer. Apply curing compound immediately after final finishing.

3.11 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Protect concrete from rapid moisture loss before and during finishing operations.
1. The evaporation graph, Figure 1, of ACI 308 - Curing Concrete, shall be used to determine the evaporation rate during concrete placement. If the rate of evaporation equals or exceeds 0.2 lbs/sq.ft./hr., steps shall be taken to prevent excessive evaporation from the surface.
 2. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing.
 - a. Initial curing may be any of the methods listed herein that maintain a satisfactory moisture content and temperature.
 3. Begin final curing procedures, if they differ from initial curing, immediately following initial curing and before concrete has dried. Continue curing for at least seven (7) days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

B. Curing Methods: Perform curing of all structural concrete as herein specified.

1. Provide moisture curing by following methods.

- a. Keep concrete surface continuously wet by covering with water.
- b. Continuous water-fog spray.
- c. Cover concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.

2. 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" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

C. Provide curing and sealing compound to pavement, walks, and curbs only, as follows:

1. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours) and after surface water sheen has disappeared. Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within three (3) hours after initial application. Maintain continuity of coating and repair damage during curing period.

D. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs, and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

E. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by moist curing methods.

1. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.

3.12 SHORES AND SUPPORTS

A. Comply with ACI 347 for shoring and reshoring in multistory construction, and as herein specified.

B. Extend shoring from ground to roof for structures four (4) stories or less, unless otherwise permitted.

C. Extend shoring at least three (3) floors under floor or roof being placed for structures over four (4) 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.

- D. Remove shores and reshore in a planned sequence to avoid damage to partially cured concrete. Locate and provide adequate reshoring to safely support work without excessive stress or deflection.
 - 1. 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.

3.13 REMOVAL OF FORMS

- A. Formwork not supporting 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 deg F (10 deg C) for five (5) days after placing concrete, provided concrete is sufficiently hard to not 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 structural elements, may not be removed in less than 14 days or 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. Lab cured cylinders will not be considered.
- C. Form facing material may be removed five (5) 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.

3.14 RE-USE OF FORMS

- A. Clean and repair surfaces of forms to be re-used 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 form work.
- B. 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 to Engineer.

3.15 MISCELLANEOUS CONCRETE ITEMS

- A. 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.

- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment with template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.
 - 1. Grout base plates and foundations as indicated, using specified non-shrink grout. Use non-metallic grout for exposed conditions, unless otherwise indicated.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads and landings and associated items. Cast-in safety inserts and accessories as shown on drawings. Screed, tamp, and finish concrete surfaces as scheduled. Cure concrete as herein specified.
- E. Reinforced Masonry: Provide concrete grout conforming to ASTM C476 for reinforced masonry lintels and bond beams where indicated on drawings and as scheduled. Maintain accurate location of reinforcing steel during concrete placement.

3.16 CONCRETE SURFACE REPAIRS

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Engineer.
 - 1. Saw-cut out honeycomb, rock pockets, voids over 1/4" in any dimension, down to solid concrete but, in no case to a depth of less than 1." Make edges of cuts slightly undercut to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with specified bonding agent. Place patching mortar after 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 surrounding color. 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.
- B. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Engineer. Surface defects, as such, 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. Flush out form tie holes, fill with Portland Cement patching mortar, or precast cement cone plugs secured in place with bonding agent. When other materials are used, apply them in accordance with manufacturer's recommendations.
 - 1. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.
 - 2. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces

- sloped to drain for trueness of slope, in addition to smoothness using a template having required slope.
3. Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01" wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets, and other objectionable conditions.
 4. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.
 5. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Engineer.
 6. Repair defective areas, except random cracks and single holes not exceeding 1" 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" 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.
 7. Repair isolated random cracks and single holes not over 1" 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. 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. Place dry pack after 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.
 8. Perform structural repairs with prior approval of Engineer or Structural Engineer for method and procedure, using specified epoxy adhesive and mortar.
 9. Repair methods not specified above may be used, subject to acceptance of Engineer.
 10. Underlayment Application: Leveling of floors for subsequent finishes may be achieved by use of specified underlayment material.

3.17 THROUGH SECTION CONCRETE CRACK REPAIRS

A. Sealing through wall or slab cracks.

11. Seal cracks for a water-tight or structurally bonded repair with epoxy or chemical grouting procedures.
 - a. The Contractor shall make proper repairs with epoxy injection or chemical injection with a moisture reactive hydrophilic polyurethane foam grout, as directed by the Engineer.

3.18 MUD MATS

- A. Where called for on the plans or as directed by the Engineer, the Contractor shall construct concrete mud mats immediately after cleaning the excavation bottom, to preserve the bearing surface condition. Concrete for mud mats shall be not less than 3 in. thick. Bottom of excavation shall be free of water, mud and loose material prior to mud mat placement. See Section 310000.
- 12. Mud mat concrete shall be cast against the side walls of all excavations to completely seal the bottom.

ADDENDUM
EXAMPLE FORM A

CONCRETE SUPPLIER: _____

PROJECT: _____ CONTRACTOR: _____

MIXTURE ID: _____ SPECIFIED f_c : _____ PSI

MATERIAL MIXTURE PROPORTIONS lbs-mass/cu.yd. (pcy)

1.0 Cement Type _____ Source: _____

Sp. Gr. _____ pcy _____ cu. ft.

1.1 Other Cementitious Materials: _____ Class: _____ Source: _____

Sp. Gr. _____ pcy _____ cu. ft.

2.0 Aggregate (No. 1) Type: _____ Size: _____ Source: _____

SSD Sp. Gr. _____ pcy _____ cu. ft.

Dry Rodded Unit Wt.: _____ pcf

Alternate (No. 1) Lightweight Aggregate Type: _____ Size: _____ Source: _____

Sp. Gr. Factor _____ over dry pcy _____ cu. ft.

Loose Unit Wt. _____ pcf Estimated Wet _____ pcf

2.1 Aggregate (No. 2) Type: _____ Size: _____ Source: _____

SSD Sp. Gr. _____ pcy _____ cu. ft.

Dry Rodded Unit Wt.: _____ pcf (If Fine Sized - FM _____)

2.2 Aggregate (Nos. 3, 4, n) Type: _____ Size: _____ Source: _____

SSD Sp. Gr. _____ pcy _____ cu. ft.

Dry Rodded Unit Wt.: _____ pcf

3.0 Water: _____ gal. _____ pcy _____ cu. ft.

EXAMPLE FORM A (CONTINUED)

4.0 Admixtures expressed as fluid ounces/cubic yard, and estimated range

Source: _____ Name: _____ Type _____ oz

Source: _____ Name: _____ Type _____ oz

Source: _____ Name: _____ Type _____ oz

Total Admixture Liquid Vol. _____ cu. ft.

(*) Note: Show volume in 4.0 if not included in cubic feet of air or water.

5.0 Other Materials - fibers, color pigment or other additions

Sp. Gr. _____ pcy _____ cu. ft.

Total Mixture Mass and Volume: _____ pcy _____ cu. ft.

Fresh Concrete Properties

Coarse & Fine Aggregate Gradation

Percent Passing

Slump _____ +/- _____ in.	Sieve Size	Aggregate No.				
		1	2	3	4	Combined
Unit Weight _____ pcf	2 in.	_____	_____	_____	_____	_____
Air Content _____ +/- _____ %	1-1/2 in.	_____	_____	_____	_____	_____
	1 in.	_____	_____	_____	_____	_____
	3/4 in.	_____	_____	_____	_____	_____
	1/2 in.	_____	_____	_____	_____	_____
If Trail Batch Data -	3/8 in.	_____	_____	_____	_____	_____
Identify Batch No. _____	No. 4	_____	_____	_____	_____	_____
Batch Date _____	No. 8	_____	_____	_____	_____	_____
Concrete Temp. _____ °F	No. 16	_____	_____	_____	_____	_____
Comp. Strength-Average _____ °F	No. 30	_____	_____	_____	_____	_____

EXAMPLE FORM A (CONTINUED)

7 day avg. _____ psi	No. 50	_____	_____	_____	_____	_____
28 day avg. _____ psi	No. 100	_____	_____	_____	_____	_____
	No. 200	_____	_____	_____	_____	_____

Comments: _____

Signature: _____ Date: _____

Title: _____

Organization: _____

EXAMPLE FORM B

CONCRETE SUPPLIER: _____

MATERIAL TRAIL BATCH NUMBER - proportions per cubic yard

1 2 3 4

1.0 Cement Source: _____

Type _____ lb lb lb lb

1.1 Other Cementitious Material Sources: _____

Type _____ lb lb lb lb

2.0 Aggregate No. 1 Size _____ Source: _____

SSD _____ lb lb lb lb

Alternate No. 1 Lightweight Aggregates Type _____ Source: _____

Sp. Gr. Factor _____

Oven Dry _____ lb lb lb lb

Wet _____ lb lb lb lb

2.1 Aggregate No. 2 Size _____ Source: _____

SSD _____ lb lb lb lb

2.2 Aggregate Nos. 3, 4, n) Size _____ Source: _____

SSD _____ lb lb lb lb

3.0 Water _____ lb lb lb lb

4.0 Admixtures Source: _____

_____ Type _____ oz oz oz oz

_____ Type _____ oz oz oz oz

_____ Type _____ oz oz oz oz

EXAMPLE FORM B (CONTINUED)

5.0 Other Materials

_____ Type _____ lb _____ lb _____ lb _____ lb

Total Mass: _____ lb _____ lb _____ lb _____ lb

Total Mass/cy: _____ pcy _____ pcy _____ pcy _____ pcy

Relative Cubic Yard Volume: _____ cy _____ cy _____ cy _____ cy

Water-Cementitious Material Ratio:

Fresh Concrete Properties

TRAIL BATCH NUMBER

	<u>## -1</u>	<u>## -2</u>	<u>## -3</u>	<u>## -4</u>
Slump-inches	_____	_____	_____	_____
Air-Content %	_____	_____	_____	_____
Unit Wt. pcf	_____	_____	_____	_____
Concrete Temp. °F	_____	_____	_____	_____
Compressive Strength Results (ASTM C192, C39) or Other Specified Test Requirements				
7 days	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
Average (7 day)	_____	_____	_____	_____

EXAMPLE FORM B (CONTINUED)

28 days

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

Average (28 day)

_____	_____	_____	_____
-------	-------	-------	-------

Water-Cementitious Material Ratio:

_____	_____	_____	_____
-------	-------	-------	-------

Signature: _____ Date: _____

Title: _____

Organization: _____

END OF SECTION 030000

SECTION 03 60 00

GROUTING

PART 1 GENERAL

1.01 DESCRIPTION

- A. Section includes: Grout for column base plates, other structural supports, equipment bases, reinforcing bar dowels, surface repair, grout toppings, patching of fresh concrete, and uses other than masonry. Adhesive anchor bolt grouting is specified in Section 05 05 20.

1.02 RELATED SECTIONS

- A. This section contains specific references to the following related sections. Additional related sections may apply that are not specifically listed below.
1. Section 03 00 00 Concrete
 2. Section 05 05 20 Anchor Bolts

1.03 REFERENCES:

- A. The references listed below are a part of this section. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Reference	Title
ASTM C109	Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 inch or 50 mm Cube Specimens)
ASTM C230	Flow Table for Use in Tests of Hydraulic Cement
ASTM C307	Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing
ASTM C939	Test Method for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method)
ASTM C531	Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes

Reference	Title
ASTM C579	Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing and Polymer Concretes
ASTM C882	Standard Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear
ASTM C942	Standard Test Method for Compressive Strength of Grouts for Preplaced-Aggregate Concrete in the Laboratory
ASTM C1107	Packaged Dry, Hydraulic-Cement Grout (Non-shrink)
ASTM C1181	Standard Test Methods for Compressive Creep of Chemical-Resistant Polymer Machinery Grouts
ASTM E329	Agencies Engaged in Construction Inspection, Testing, or Special Inspection
COE CRD-C611	Flow of Grout for Preplaced Aggregate Concrete
COE CRD-C621	Non-shrink Grout
IBC	International Building Code

1.04 SUBMITTALS

A. Action Submittals

1. Procedure: Section 01 33 23:
2. A copy of this specification section with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements.
3. Check-marks (✓) shall denote full compliance with a paragraph as a whole. Deviations shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications. Include a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.
4. Complete product literature, including mixing, handling and placement instructions for the following: Cementitious non-shrink grout, epoxy grout, adhesive for reinforcing bar dowel grouting, concrete repair mortar, and prepackaged cement grout products to be used on the project.
5. Mix design for cement grout that is not prepackaged, including product data for aggregates and cement in accordance with Section 03 00 05.

6. Current ICC Evaluation Service reports for adhesives used for reinforcing dowels.
7. Installer certification in accordance with ACI/CRSI Adhesive Anchor Installer Certification Program for installers of horizontal or upwardly inclined reinforcing bar dowels grouted using adhesive.
8. Certified test results verifying the compressive strength, shrinkage and expansion requirements specified herein.

1.05 QUALITY ASSURANCE

A. Quality Control by Owner

1. The Owner will provide the services of a qualified Special Inspector in accordance with Section 01 43 23.
2. Adhesive anchors installed in horizontal or upwardly inclined orientations to resist sustained tension loads shall be continuously inspected during installation by a Special Inspector.
 - a. The Special Inspector shall furnish a report to the Engineer, Owner's Representative and Building Official that the work covered by the report has been performed and that the materials used and the installation procedures used conform with the approved Project Manual and the Manufacturer's Printed Installation Instructions (MPII).

B. Quality Control by Contractor

1. Provide the services of an independent testing laboratory which complies with the requirements of ASTM E329 if a product other than those listed below is proposed and test data is not available from the supplier to demonstrate equivalence to the specified grout. The testing laboratory shall sample and test the proposed grout materials. Costs of testing laboratory services shall be borne by the Contractor.

C. Certifications

1. Installer certification shall be in accordance with ACI/CRSI Adhesive Anchor Installer Certification Program for installers of horizontal or upwardly inclined reinforcing bar dowels grouted using adhesive.

D. Compression test specimens will be taken during construction from the first placement of each type of grout and at intervals thereafter as selected by the Engineer to insure continued compliance with these Specifications.

1. Compression tests and fabrication of specimens for epoxy grout will be performed as specified in ASTM C579, Method B, at intervals during construction as selected by the Engineer. A set of three specimens will be made for testing at seven days and any other time period as appropriate.
2. Compression tests and fabrication of specimens for cement grout and non-shrink grout will be performed as specified in ASTM C109 at intervals during construction as selected by the Engineer. A set of three specimens will be made for testing at seven days, 28 days and any additional time period as appropriate.

E. Manufacturer Qualifications

1. Manufacturer shall have a minimum of five years experience of producing products substantially similar to that required and shall be able to submit documentation of at least five satisfactory installations that have been in successful operation for at least five years each.
2. When required, provide services of manufacturer's full-time employee, factory-trained in handling, use, and installing the products required, with at least five years of experience in field applications of the products required.

PART 2 PRODUCTS

2.01 CEMENTITIOUS NON-SHRINK GROUT

- A. The grout material shall be an approved ready to use mixture requiring only water for use at the job site. The 2-inch cubes shall have a minimum compressive strength of 3,000 psi at 7 days and 7,000 psi at 28 days.
- B. Cementitious non-shrink non-metallic aggregate grout shall be:
 1. BASF, Masterflow 928
 2. Euclid Chemical Company, Hi-Flow Grout
 3. Five Star Products, Inc., Five Star Grout
 4. Sika Corporation, SikaGrout 212
 5. Approved Equal
- C. Non-shrink grout shall conform to CRD-C 621 and ASTM C1107, Grade B or C when tested at a maximum fluid consistency of 30 seconds per ASTM C939 at temperature extremes of 45 degrees Fahrenheit and 90 degrees Fahrenheit and an extended working time of 15 minutes.
- D. Fluid grout shall pass through the flow cone, with continuous flow, one hour after mixing.

2.02 EPOXY GROUT FOR EQUIPMENT MOUNTING:

- A. Epoxy grout shall be a pourable, non-shrink, 100-percent solids system.
- B. Epoxy grout for equipment mounting shall be a non-cementitious, resin based, multi-component formulation. Epoxy grout shall be flowable, with shrinkage minimized to achieve minimum 98% effective bearing area. Epoxy grout shall be:
 1. BASF, Masterflow 648
 2. Euclid Chemical Company, E3-G
 3. Sika Corporation, Sikadur 42
 4. Approved Equal.

- C. The following properties shall be attained with the minimum quantity of aggregate allowed by epoxy grout manufacturer.
1. Length change after hardening shall be less than 0.0006-inch per inch and coefficient of thermal expansion shall be less than 0.00003-inch per inch per degree F when tested in accordance with ASTM C531.
 2. Compressive creep at one year shall be less than 0.001-inch per inch when tested under a 400-psi constant load at 140 degrees F in accordance with ASTM C1181.
 3. Minimum seven-day compressive strength shall be 14,000 psi when tested in accordance with ASTM C579
 4. Grout shall be capable of maintaining at least a flowable consistency for minimum of 30 minutes at 70 degrees F.
 5. Shear bond strength to portland cement concrete shall be greater than shear strength of concrete when tested in accordance with ASTM C882/C882M.

2.03 ADHESIVE FOR GROUTING REINFORCING BAR DOWELS

- A. Adhesive for setting dowels in concrete shall be an injectable two-component epoxy adhesive. Adhesive shall be approved for the intended use per the product ICC Report. Adhesive shall be:
1. Hilti, HIT-RE 500v3
 2. Simpson Strong Tie, SET XP
 3. Approved Equal (equivalent product must have ICC approval for use in cracked concrete in areas with high seismic risk).
- B. Adhesive for setting dowels in concrete masonry shall be an injectable two-component epoxy adhesive. Adhesive shall be approved for the intended use per the product ICC Report or IAPMO Report. Adhesive shall be:
1. Hilti, HIT-HY 70
 2. Simpson Strong Tie, SET XP
 3. Approved Equal

2.04 CONCRETE REPAIR MORTAR

- A. Horizontal Applications: Repair mortars shall be:
1. BASF, MasterEmaco S 466CI
 2. Sika Corporation, SikaTop 111 Plus
 3. Approved Equal
- B. Vertical and Overhead Applications: Repair mortars shall be:
1. BASF, MasterEmaco 1500HCR Vertical Overhead
 2. Sika Corporation, SikaTop 123 Plus
 3. Approved Equal

2.05 CEMENT GROUT

- A. Cement grout shall be comprised of cement, fine aggregate, coarse aggregate, water, and admixtures proportioned and mixed in accordance with this Section.
 - 1. Minimum Compressive Strength: 4,500 psi at 28 days.
 - 2. Maximum Water Cement Ratio: 0.42 by weight.
 - 3. Coarse Aggregate: ASTM C33/C33M, No. 8 size.
 - 4. Fine Aggregate: ASTM C33/C33M, approximately 60 percent by weight of total aggregate.
 - 5. Air Content: Five percent (plus or minus one percent).
 - 6. Minimum Cement Content: 564 pounds per cubic yard.
 - 7. Slump for grout fill shall be adjusted to match placing and finishing conditions, and shall not exceed four inches.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine and accept existing conditions before beginning work.

3.02 CEMENTITIOUS NONSHRINK GROUT

- A. Non-shrink, cementitious, nonmetallic aggregate grout shall be used for column base plates, structural bearing plates, and all locations where the general term “non-shrink grout” is indicated on the Drawings. Use of this grout to support the bearing surfaces of machinery shall be as specified as detailed on the Drawings for specific locations or pieces of equipment. If guidance is not provided in locations noted above, use of non-shrink grout for equipment mounting shall be limited to equipment less than 25 horsepower or 750 pounds. Grout shall be placed and cured in accordance with the manufacturer's instructions.
- B. Non-shrink cementitious grout shall not be used as a surface patch or topping. Non-shrink cementitious grout must be used in confined applications only.

3.03 EPOXY GROUT FOR EQUIPMENT MOUNTING

- A. Prepare concrete surfaces of equipment pads as indicated in details on the Drawings and as required by the epoxy grout manufacturer. Epoxy grout for equipment mounting shall be placed and cured in accordance with the manufacturer's recommendations.

3.04 ADHESIVE FOR GROUTING REINFORCING BAR DOWELS

- A. Follow manufacturer's instructions.

3.05 CONCRETE REPAIR MORTAR

- A. Concrete repair materials and procedures shall be submitted for review to the Owner's Representative and shall be accepted prior to commencement of the repair work.
- B. Follow all manufacturer's instructions, including those for minimum and maximum application thickness, surface preparation and curing. Add aggregate as required per manufacturer's recommendations. Any deviations from the manufacturer's instructions shall be submitted for review to the Owner's Representative and shall be accepted prior to commencement of the work.

3.06 CEMENT GROUT

- A. Cement grout shall be used for grout toppings less than four inches thick and for patching of fresh concrete.
- B. Grouting shall comply with temperature and weather limitations in Section 03 00 05, Cast-In-Place Concrete.
- C. Cure grout in accordance with grout manufacturer's instructions for prepackaged grout and Section 030000, for non-prepackaged cement grout.

END OF SECTION

SECTION 05 05 20
ANCHOR BOLTS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes: Bolts and all-thread rods used to attach structural elements and equipment to concrete. Included are cast-in-place and post-installed anchors (adhesive systems and wedge type expansion anchors), nuts and washers.
- B. Cast-in-place and post-installed anchors shall be Type 316 stainless steel unless noted otherwise.

1.01 RELATED SECTIONS

- A. This section contains specific references to the following related sections. Additional related sections may apply that are not specifically listed below.
 - 1. Section 03 00 00 Concrete Work
 - 2. Section 03 60 00 Grouting

1.02 REFERENCES

- A. The references listed below are a part of this section. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Reference	Title
ACI 318	Building Code Requirements for Structural Concrete
ASTM A193	Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
ASTM A194	Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
ASTM A320	Alloy-Steel and Stainless Steel Bolting for Low-Temperature Service
ASTM A563	Carbon and Alloy Steel Nuts
ASTM F593	Stainless Steel Bolts, Hex Cap Screws, and Studs
ASTM F594	Stainless Steel Nuts
ASTM F844	Washers, Steel, Plain (Flat), Unhardened for General Use
ASTM F1554	Anchor Bolts, Steel, 36, 55, 105-ksi Yield Strength
IBC	International Building Code with local amendments

Reference	Title
OBC	Ohio Building Code with local amendments

1.03 SUBMITTALS

A. Action Submittals

1. Procedures: Section 01 33 23
2. A copy of this specification section with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements.
3. Check-marks (ü) shall denote full compliance with a paragraph as a whole. Deviations shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications. Include a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.
4. Anchor bolt placement plans.
5. Anchor bolt, nut, and washer material information, including material certifications.
6. Record copy of design calculations and details showing the required diameter, length, embedment, edge distance, confinement, anchor reinforcement, anchor bolt sleeves, connection redesign, and other conditions, stamped and signed by a Professional Engineer currently registered in the state of Ohio. Calculations shall comply with the provisions of ACI 318-14, Chapter 17. Base anchor capacity determination on cracked concrete condition and compressive strength of new concrete per Section 03 30 00. Assume compressive strength of existing concrete is 3,000 psi unless otherwise noted.
7. Submit record copy of proof loading test results within five days after test.
8. Product Data:
 - a. ICC Evaluation Service Reports for post-installed adhesive type anchors and expansion (wedge type) anchors when allowed. Products shall be ICC approved for use in cracked concrete in high seismic areas (Seismic Design Category D, E and F).
 - b. Product data indicating load capacity charts/calculations.
 - c. Chemical resistance.
 - d. Temperature limitations.
 - e. Manufacturers written installation instructions.
9. Installer certification for horizontal or upwardly inclined adhesive anchors in accordance with ACI/CRSI Adhesive Anchor Installer Certification Program.

1.04 QUALITY ASSURANCE

A. Quality Assurance By Owner

1. Special inspection of anchor bolts shall be performed by the Special Inspector under contract with the Owner and in accordance with IBC Chapter 17.
2. A five percent sample of installed post-installed anchors shall be proof-loaded by an independent laboratory contracted by the Contractor. The quantity of samples and locations shall be coordinated with the Owner's Representative.
3. Adhesive anchors installed in horizontal or upwardly inclined orientations to resist sustained tension loads shall be continuously inspected during installation by a Special Inspector.
4. The Special Inspector shall furnish a report to the Engineer, Owner's Representative, and Building Official that the work covered by the report has been performed and that the materials used and the installation procedures used conform with the approved Project Manual and the Manufacturer's Printed Installation Instructions (MPII).

B. Certifications

1. Installer certification shall be in accordance with ACI/CRSI Adhesive Anchor Installer Certification Program for installers of horizontal or upwardly inclined adhesive anchors.

PART 2 PRODUCTS

2.01 GENERAL

- A. Anchor bolt holes in equipment support frames shall not exceed the bolt diameters by more than 1/4 inch. Minimum anchor bolt diameter shall be 1/2 inch. Anchor bolts for equipment mounting and vibration isolation systems shall be provided as specified in Sections 43 05 13 and 43 05 18, respectively.
- B. Tapered washers shall be provided where mating surface is not square with the nut.
- C. Anchor bolts shall be cast-in-place anchors unless post-installed anchors are specified or shown on the Drawings. Substitution of post-installed anchors will not be permitted unless specifically requested by the Contractor and approved by the Engineer.

2.02 PERFORMANCE/DESIGN CRITERIA

- A. Anchor bolts for equipment shall be designed by the equipment manufacturer to include equipment operational loads combined with seismic and wind forces when applicable. Design criteria provided in Section 01 73 24.
- B. Design anchor bolts for support and bracing of non-structural components and non-building structures for loading specified in Section 01 73 24.

2.03 MATERIALS

A. Anchor bolt materials shall be as specified in the following table:

Material	Specification
Stainless Steel Anchor Bolts	ASTM A193 or A320, Type 316
Stainless Steel Threaded Rods	ASTM F593, Type 316
Stainless Steel Nuts	ASTM A194 Heavy Hex Nuts, Type 316 ASTM F594 Heavy Hex Nuts at Adhesive Anchors, Type 316 ASTM A194 Heavy Hex Nuts Grade 8S (Nitronic 60)
Stainless Steel Washers	Type 316 to match bolt material
Carbon Steel Anchor Bolts	ASTM F1554, Grade 36, Hot Dip Galvanized
High-Strength Carbon Steel Anchor Bolts	ASTM F1554, Grade 55, Weldable per Supplementary Requirement S1, Hot Dip Galvanized
Carbon Steel Nuts and Washers	ASTM A563 and F844, Heavy Hex, Hot-Dip Galvanized
Concrete Adhesive Anchors	Hilti "HIT-RE 500v3", Simpson Strong-Tie "SET-XP", or approved equal, with Type 316 Stainless Steel threaded rods
Concrete Masonry Adhesive Anchors	Hilti "HIT-HY 70", Simpson Strong-Tie "SET-XP", or approved equal, with Type 316 Stainless Steel threaded rods
Concrete Masonry Expansion (wedge) Anchors*	Hilti "KWIK BOLT 3", or approved equal, Type 316 Stainless Steel
Concrete Expansion (wedge) Anchors *	Hilti "KWIK BOLT TZ", or approved equal, Type 316 Stainless Steel

**Post installed anchors shall always be an adhesive type anchor system except where noted otherwise or when Contractor makes a request for a specific application and Engineer approves.*

2.04 STAINLESS STEEL FASTENER LUBRICANT (ANTI-SEIZING)

A. Anti-seizing Lubricant for Stainless Steel Threaded Connections:

1. Formulated to resist washout.
2. Acceptable manufacturers are Bostik, Saf-T-Eze, or equal.

2.05 ANCHOR BOLT SLEEVES

- A. Provide anchor bolt sleeves as shown on design drawings and as required by equipment manufacturer's design.
 - 1. Provide high density polyethylene plastic sleeves of single unit construction with deformed sidewalls such that the concrete and grout lock in place.
 - 2. The top of the sleeve shall be self-threading to provide adjustment of the threaded anchor bolt projection.
 - 3. Acceptable manufacturers are Contec, Wilson, or equal.

PART 3 EXECUTION

3.01 GENERAL

- A. Anchor bolts shall be cast-in-place anchors unless post-installed anchors are specified or shown on the Drawings.
- B. Grouting of anchor bolts using plastic sleeves with non-shrink or epoxy grout, where specified, shall be in accordance with Section 03 60 00.
- C. The threaded end of anchor bolts and all-thread rods shall be long enough to project through the entire depth of the nut and if too long, shall be cut off at ½-inch beyond top of nut and ground smooth.

3.02 CAST-IN-PLACE ANCHOR BOLTS

- A. Anchor bolts to be embedded in concrete shall be placed accurately and held in correct position using templates while the concrete is placed.
- B. After anchor bolts have been embedded, their threads shall be protected by grease and the nuts run on.

3.03 ADHESIVE ANCHOR BOLTS

- A. Note that adhesive anchors shall not be substituted for cast-in-place anchor bolts unless the adhesive anchors have been specified or shown on the Drawings, or approval has been obtained from the Engineer that substitution of adhesive anchors is acceptable for the specific use and location. Use of adhesive anchors shall be subject to the following conditions:
 - 1. Limit to locations where intermittent or continuous exposure to the following is extremely unlikely:
 - a. Acid concentrations higher than 10 percent
 - b. Chlorine gas
 - c. Machine or diesel oils

2. Limit to applications where exposure to the following is extremely unlikely:
 - a. Fire
 - b. Concrete or rod temperature above 120 degrees F
3. Overhead applications (such as pipe supports) shall not be allowed unless approved by the Engineer and installation is by an Installer specially certified for overhead applications.
4. Approval from Engineer for specific application and from supplier of equipment to be anchored, if applicable.
5. Anchor diameter and material shall be per Contract Documents or equipment manufacturer's specifications. Anchor shall be threaded or deformed the full length of embedment and shall be free of rust, scale, grease, and oils.
6. Embedment depth shall be as specified or as required by the equipment manufacturer.
7. Follow the anchor system manufacturer's installation instructions.
8. Holes shall have rough surfaces created by using a hammer drill with carbide bit. Core drilled holes are not allowed.
9. Holes shall be blown clean with oil-free compressed air and be free of dust or standing water prior to installation. Follow additional requirements of the adhesive manufacturer.
10. Concrete and air temperature shall be compatible with curing requirements of adhesives per adhesive manufacturer's instructions. Anchors shall not be placed in concrete when the temperature is below 25 degrees F.
11. Anchors shall be left undisturbed and unloaded for full adhesive curing period, which is based on temperature of the concrete.

3.04 EXPANSION ANCHORS

- A. Expansion (wedge type) anchors shall not be substituted for cast-in-place anchor bolts or adhesive anchors unless approved by the Engineer for a specific application. Use of expansion anchors shall be subject to conditions 4 through 9 as specified above for adhesive anchors. Expansion anchors shall not be used in a submerged condition or in mounting of equipment subject to vibration or cyclic motion.

3.05 REINFORCING STEEL CONFLICTS WITH POST-INSTALLED ANCHOR INSTALLATION

- A. When reinforcing steel is encountered in the drill path, slant drill to clear obstruction and provide beveled washer to match angle of anchor. Drill shall not be slanted more than 10 degrees.
- B. Where slanting the drill does not resolve the conflict, notify the Owner's Representative and resolve the conflict to the satisfaction of the Owner's Representative in consultation with the Engineer.

- C. Abandoned post-installed anchor holes shall be cleaned and filled with non-shrink grout and struck off flush with adjacent surface.
- D. The costs of determining and executing the resolution shall be borne by the Contractor. The determination and execution of the resolution shall not result in additional cost to the Owner.
- E. Reinforcing steel in masonry shall not be damaged.
- F. In order to avoid or resolve a conflict, locate embedded reinforcing steel using non-destructive methods and/or redesign the attachment.
 - 1. Redesign shall be done by the Contractor's Professional Engineer currently registered in the state of Ohio.
 - 2. Calculations and details for redesign shall be submitted.

END OF SECTION

SECTION 05 50 00
METAL FABRICATIONS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:

1. Custom fabricated metal items and certain manufactured units not otherwise indicated to be provided under work of other specification sections.
2. Seat angle frames
3. Pipe sleeves
4. Miscellaneous metal fabrications not covered elsewhere

1.02 RELATED SECTIONS

A. This section contains specific references to the following related sections. Additional related sections may apply that are not specifically listed below.

1. Section 05 05 20 Anchor Bolts

1.03 REFERENCES

A. The references listed below are a part of this section. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Reference	Title
Aluminum Design Manual	The Aluminum Association, Aluminum Design Manual with Specifications and Guidelines for Aluminum Structures
AISC 303	Code of Standard Practice for Steel Buildings and Bridges
AISC 360	Specification for Structural Steel Buildings
AISC Steel Construction Manual	American Institute of Steel Construction, Manual of Steel Construction
ANSI A14.3	Standard for Ladders - Fixed - Safety Requirements
ASTM A36	Carbon Structural Steel
ASTM A48	Gray-Iron Castings
ASTM A53	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

Reference	Title
ASTM A108	Steel Bar, Carbon and Alloy, Cold-Finished
ASTM A123	Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products
ASTM A153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A193	Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
ASTM A194	Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
ASTM A240	Chromium and Chromium Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM A276	Stainless Steel Bars and Shapes
ASTM A283	Low and Intermediate Tensile Strength Carbon Steel Plates
ASTM A307	Carbon Steel Bolts, Studs, and Threaded Rod 60000 psi Tensile Strength
ASTM A312	Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
ASTM A320	Alloy-Steel Bolting Materials for Low Temperature Service
ASTM A325	Structural Bolts, Steel, Heat Treated 120/105 ksi Minimum Tensile Strength
ASTM A380	Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems
ASTM A384	Standard Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies
ASTM A489	Carbon Steel Lifting Eyes
ASTM A500	Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A554	Welded Stainless Steel Mechanical Tubing
ASTM A563	Carbon and Alloy Steel Nuts
ASTM A572	High-Strength Low-Alloy Columbium-Vanadium Structural Steel
ASTM A653	Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process
ASTM A780	Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings
ASTM A786	Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates

Reference	Title
ASTM A793	Rolled Floor Plate, Stainless Steel
ASTM A924	Steel Sheet, Metallic-Coated by Hot-Dip Process
ASTM A992	Structural Steel Shapes
ASTM A1011	Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
ASTM B209	Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B210	Aluminum and Aluminum-Alloy Drawn Seamless Tubes
ASTM B211	Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire
ASTM B221	Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM B241	Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube
ASTM B308	Aluminum-Alloy 6061-T6 Standard Structural Profiles
ASTM B429	Aluminum-Alloy Extruded Structural Pipe and Tube
ASTM B632	Aluminum-Alloy Rolled Tread Plate
ASTM D1056	Flexible Cellular Materials - Sponge or Expanded Rubber
ASTM F436	Hardened Steel Washers
ASTM F468	Nonferrous Bolts, Hex Cap Screws, SocketHead Cap crews and Studs for General Use
ASTM F593	Stainless Steel Bolts, Hex Cap Screws, and Studs
ASTM F594	Stainless Steel Nuts
AWS D1.1	Structural Welding Code - Steel
AWS D1.2	Structural Welding Code - Aluminum
AWS D1.6	Structural Welding Code - Stainless Steel
OSHA 29 CFR 1910.27	Fixed Ladders
OSHA 29 CFR 1926.502	Fall Protection Systems Criteria and Practices
SSPC SP5	White Metal Blast Cleaning
IBC	International Building Code

1.04 DEFINITIONS

A. Galvanize: Hot-dip galvanize per ASTM A123 or ASTM A153.

1.05 SUBMITTALS

A. Action Submittals:

1. Procedures: Section 01 33 23
2. A copy of this specification section with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements.
3. Check-marks (ü) shall denote full compliance with a paragraph as a whole. Deviations shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications. Include a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration
4. Manufacturer's product data.
5. Detailed Shop Drawings:
 - a. Fabrication drawings showing layouts, connections to structural system, and anchoring details.
 - b. Erection and installation drawings indicating thickness, type, grade, class of metal, coating system and dimensions.
 - c. Construction details, reinforcement, anchorage, and installation with relation to the building construction.
6. Welding procedures and welder certificates and qualifications.
7. Passivation method for stainless steel fabrications.

1.06 QUALITY ASSURANCE

A. Qualifications

1. Fabricator shall have a minimum of five years experience in fabrication of metal specified.

B. Certificates

1. Certified welding procedures and welding operators in accordance with AWS. Welding operator certificates shall be no more than one-year old and the welder shall have used the welding process to be performed within the last six months.

C. The use of salvaged, reprocessed or scrap materials will not be permitted.

D. Shop Assembly: Items in the shop shall be preassembled to the greatest extent possible, so as to minimize field splicing and assembly of units. Units shall be

disassembled only to the extent necessary for shipping and handling limitations.
Units shall be clearly marked for reassembly and coordinated installation.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Avoid damage during delivery and handling of fabrications.
- B. Store off the ground on skids or other supports to keep items free of dirt and other foreign debris and to protect against corrosion.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Materials for miscellaneous metalwork are specified in the following table.

Material	Specification
Steel	
Sheets, plates and shapes (except W shapes)	ASTM A36
W shapes	ASTM A992
Pipe	ASTM A53, Grade B
Square/rectangular tubing	ASTM A500, Grade B
Headed Anchor Studs	ASTM A108
Carbon steel bolts	ASTM A307, Grade A
High strength bolts	ASTM A325 (Type 1)
Nuts	ASTM A563
Washers	ASTM F436
Stainless Steel	
Sheet and Plates	ASTM A240, Type 316 or 316L
Shapes, bars, and similar items	ASTM A276, Type 316 or 316L
Pipe	ASTM A312, Type 316 or 316L
Headed Anchor Studs	ASTM A276, Type 316L
Bolts	ASTM F593, Type 316
Nuts	ASTM F594, Type 316
Aluminum	
Sheets and plates	ASTM B209, Type 6061-T6

Material	Specification
Bars, flats and similar items	ASTM B211 or B221, Type 6061-T6
Shapes	ASTM B308, Type 6061-T6
Round tubing and pipe	ASTM B241, Type 6061-T6
Square and rectangular tubing	ASTM B221, Type 6063-T52
Pipe	ASTM B211 or B241, Type 6061-T6
Bolts, Stainless Steel	ASTM F593, Type 316
Nuts, Stainless Steel	ASTM F594, Type 316
Checker Plate	
Steel	ASTM A786
Stainless steel	ASTM A793, Type 304
Aluminum	ASTM B632, Type 6061-T6
Other steel items	
Iron castings	ASTM A48
Eyebolts	ASTM A489
Threaded rods	ASTM A36

2.02 FABRICATION

A. General

1. Conform to AISC or Aluminum Association standards as applicable. Where Code defined loads apply, also conform to IBC requirements.
2. Shop and field welding shall conform to the requirements of AISC, the Aluminum Design Manual, and applicable AWS procedures and specifications as required by the material being welded.
3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt, tight, flush, and hairline. Remove burrs and weld splatter. Ease exposed edges to small uniform radius.
4. Holes shall be punched 1/16 inch larger than the nominal size of the bolts, unless otherwise specified. Whenever needed, because of the thickness of the metal, holes shall be subpunched and reamed or shall be drilled.
5. Fabrication, including cutting, drilling, punching, threading and tapping required for fabrications or adjacent work, shall be performed prior to galvanizing.

B. Seat Angle Frames

1. Provide recessed seat angle frames for grating and floor plates. Miter corners to ensure accurate fit. Match depth of recess with grating or floor plate thickness. Anchor frames in concrete with headed studs. Steel angle support frames shall be stainless steel, ASTM A276, Type 316, unless indicated otherwise.

C. Other Miscellaneous Steel Metalwork

1. Other miscellaneous steel metalwork including embedded and non-embedded steel metalwork, hangers and inserts shall be as specified or shown on the Drawings, and shall be galvanized after fabrication unless otherwise noted.

2.03 FINISHES

A. Galvanizing

1. Galvanize items specified to be zinc-coated, after fabrication where practicable. Galvanizing in accordance with ASTM A123, ASTM A153, ASTM A653 or ASTM A924, Z275 G90, as applicable. Galvanize anchor bolts, grating fasteners, washers, and parts or devices necessary for proper installation, unless indicated otherwise.
2. Repair damaged Zinc-Coated surfaces with galvanizing repair method and paint conforming to ASTM A780 or by application of stick or thick paste material specifically designed for repair of galvanizing, as approved by Owner's Representative.
3. Safeguard against warpage and distortion during galvanizing of steel in accordance with ASTM A384. Straighten items after galvanizing so that they are straight, free of racking and distortion.

B. Shop Painting

1. Prepare and coat surfaces in accordance manufacturer specifications.
2. Steel to be embedded in concrete shall be free of dirt and grease.

C. Aluminum Surfaces

1. Surface condition aluminum before finishes are applied. Remove roll marks, scratches, rolled-in scratches, kinks, stains, pits, orange peel, die marks, structural streaks, and other defects which will affect uniform appearance of finished surfaces.
2. Aluminum finishes for unexposed sheet, plate and extrusions may have mill finish as fabricated.
3. Provide other aluminum items with a standard mill finish.
4. Provide a coating thickness not less than that specified for protection.
5. Provide decorative type finishes for items used in interior occupied locations or architectural type finish for items used in exterior locations.
6. Provide a polished satin finish on items to be anodized.

D. Stainless Steel Passivation

1. Stainless steel to be cleaned, descaled, and passivated after fabrication in accordance with ASTM A380. Passivate to remove iron compounds from the surface of the stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify measurements at the site. Include field dimensions in shop drawings.
- B. Examine and accept existing conditions before beginning work.

3.02 PREPARATION

- A. Make provisions for erection loads with temporary bracing. Keep work in alignment.
- B. Supply items required to be cast into concrete or embedded in masonry with setting templates.

3.03 INSTALLATION

- A. Install items plumb, level and square, accurately fitted, and free from distortion or defects. Install rigid, substantial, and neat in appearance.
- B. Allow for erection loads and provide temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Fieldwork shall not be permitted on galvanized items. Drilling of bolts or enlargement of holes to correct misalignment will not be allowed.
- D. Protect encased or embedded dissimilar metals (both metals must be encased or embedded) from galvanic corrosion by means of pressure tapes, coatings or isolators.
- E. Place metalwork to be embedded in concrete accurately and hold in correct position while the concrete is placed or, if indicated, form recesses or blockouts in the concrete. Thoroughly clean the surfaces of metalwork in contact with or embedded in concrete.
- F. Seat angles, supports and guides: Set seat angles for grating and supports for floor plates so that they maintain the grating and floor plates flush with the floor.
- G. Fastening to Construction-In-Place: Provide anchorage devices and fasteners where necessary for fastening fabricated items to construction-in-place. Anchor bolts to be in accordance with Section 05 05 20.

3.04 REPAIR/RESTORATION

A. Galvanized

1. Maximum area to be repaired shall not be more than 1/2 of 1 percent of the surface area or 36 sq. in. per ton of piece weight, whichever is less. Damage in excess of this requirement shall be repaired by stripping and recoating entire piece.
2. Clean damaged areas to SSPC-SP5. Repair with zinc-rich paint in accordance with the manufacturer's instructions and with ASTM A780, Annex A2. Minimum thickness requirements shall be in accordance with ASTM A123.
3. Use zinc-rich repair paint. Acceptable manufacturers:
 - a. LPS, Cold Galvanize
 - b. ZRC Worldwide, ZRC Galviline
 - c. Approved Equal

B. Painted

1. After installation, clean and touch up damaged areas with the same materials used for the shop coat.

3.05 FIELD QUALITY CONTROL

A. Electrolytic Protection

- B. Protect dissimilar metals from galvanic corrosion by means of pressure tapes, coatings, or isolators. Aluminum in contact with concrete or grout shall be protected with a heavy coat of bituminous paint.

C. Stainless Steel

1. During handling and installation, take necessary precautions to prevent carbon impregnation of stainless steel members.
2. After installation, visually inspect stainless steel surfaces for evidence of iron rust, oil, paint, and other forms of contamination.
3. Remove contamination in accordance with requirements of ASTM A380.
4. Brushes used to remove foreign substances shall utilize only stainless steel or nonmetallic bristles.

END OF SECTION

SECTION 07 92 00
JOINT SEALANTS

PART 1 GENERAL

1.01 DESCRIPTION

A. This section specifies sealants for Drop shaft structure.

1.02 QUALITY ASSURANCE

A. References:

1. This section contains references to the following documents. They are a part of this section as specified and modified. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.
2. Unless otherwise specified, references to documents shall mean the documents in effect at the time of Advertisement for Bids or Invitation to Bid (or on the effective date of the Agreement if there were no Bids). If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, regardless of whether the document has been superseded by a version with a later date, discontinued or replaced.

Reference	Title
FEDSPEC TT-S-00230C	Sealing Compound: Elastomeric Type, Single Component
FEDSPEC TT-S-00227E	Sealing Compound: Elastomeric Type, Multi-Component

PART 2 PRODUCTS

2.01 POLYURETHANE SEALANT

A. Acceptable Products:

1. Acceptable products shall be Sikaflex by Sika Chemical Corporation, Vulkem by Mameco International, U-Seal Joint Sealant by Burke Company, or Rubber Calk by Products Research and Chemical Corporation.

B. General:

1. Polyurethane sealants shall conform to FEDSPEC TT-S-0230C for one-component systems and FEDSPEC TT-S-00227E for two-component systems. Polyurethane sealant shall be one of the following two types.
 - a. Self-Leveling:
 - 1) Self-leveling polyurethane sealant shall be Type I, Class A as specified by the FEDSPECs referenced above.
 - b. Nonsag:
 - 1) Nonsag polyurethane sealant shall be Type II, Class A as specified by the FEDSPECs referenced above.

C. Primer:

1. Primer shall be as recommended by the sealant manufacturer.

D. Backer Rod or Backer Tape:

1. Backer rod shall be open cell polyethylene or polyurethane foam. Rod shall be cylindrical unless otherwise specified. Backer tape shall be polyethylene or polyurethane with adhesive on one side.

2.02 MASTIC SEALANT

A. General:

1. Mastic joint sealant shall consist of a blend of refined asphalts, resins and plasticizing compounds, reinforced with fiber. Sealant shall be compatible with joint fillers and shall be pressure grade.

B. Primer:

1. Primer shall be as recommended by the mastic sealant manufacturer.

2.03 PRODUCT DATA

A. The following information shall be provided in accordance with Section 01 33 23

1. Manufacturer's product data showing conformance to the specified products.
2. Manufacturer's recommendations for storage, handling and application of sealants and primers.

PART 3 EXECUTION

3.01 GENERAL

- A. Sealants and primers shall be applied according to the sealant manufacturer's recommendations. Polyurethane sealants shall be used on all expansion joints and specified construction joints.

- B. Joints and spaces to be sealed shall be clean, dry and free of dust, loose mortar, concrete and plaster. Additional preparation of joints and spaces shall be provided in accordance with manufacturer's recommendations. Primer shall be applied only to the surfaces that will be covered by the sealant.

3.02 POLYURETHANE SEALANTS

A. General:

- 1. Nonsag polyurethane sealants shall be used on vertical joints. Self-leveling polyurethane sealants shall be used on horizontal joints.

B. Joint Dimensions:

- 1. Unless otherwise specified, joints and spaces to be filled shall be constructed to the following criteria. Joints and spaces shall have a minimum width of 1/4 inch and a maximum width of 1 inch. The depth of the sealant shall be one-half the width of the joint, but in no case less than 1/4 inch deep. Sealant depth shall be measured at the point of smallest cross section. When joints exceed the depth requirements, backing rod shall be inserted to provide the joint depth specified. If the joint sealant depth is within the specified tolerances, backer tape shall be placed in the bottom of the joint.

3.03 MASTIC SEALANT

A. Joint Dimensions:

- 1. Joints to be sealed shall be 2 inches deep, 1 inch wide at the top, and 3/4 inch wide at the base.

END OF SECTION

SECTION 08 31 20
FLOOR ACCESS DOORS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes: Factory-fabricated single or double leaf aluminum floor access doors and frames with water drainage.

1.02 REFERENCES

- A. The references listed below are a part of this section. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Reference	Title
ASTM B221	Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM B632	Aluminum-Alloy Rolled Tread Plate
ASTM A240	Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM F593	Stainless Steel Bolts, Hex Cap Screws, and Studs
ASTM F594	Stainless Steel Nuts
AASHTO	American Association of State Highway and Transportation Officials
OSHA	U.S. Dept. of Labor, Occupational Safety and Health Administration

1.03 SUBMITTALS

- A. Action Submittals:
1. Procedures: Section 01 33 23.
 2. A copy of this specification section with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements.
 3. Check-marks (✓) shall denote full compliance with a paragraph as a whole. Deviations shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the

specifications. Include a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

4. Statement of experience for both manufacturer and installer.
5. Fabrication drawings showing layouts, connections to structure, and anchoring details.
6. Erection and installation drawings showing construction details, reinforcement, anchorage, and installation with relation to the building construction.
7. Drain pipe layout from the drain coupling to the discharge point.

B. Informational Submittals:

1. Manufacturer's product data showing conformance to the specification.
2. Structural calculations for the floor access door design provided by the manufacturer and sealed by a registered professional engineer registered in the State of Ohio.
3. Instructions for the storage, handling, installation, and operation.
4. Manufacturer's warranty.

1.04 QUALITY ASSURANCE

A. Manufacturer: Minimum of 5 years' experience manufacturing similar products.

B. Installer: Minimum of 2 years' experience installing similar products.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacturer's original packaging, stored in a dry, protected, well-vented area. Inspect product upon receipt and report damage to carrier and manufacturer.

1.06 SPECIAL WARRANTY

A. Materials shall be free of defects in material and workmanship for a period of 5 years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. The following manufacturers are acceptable. The manufacturer's standard product may require modification to conform to specified requirements.

1. The Bilco Company.

2. East Jordan Iron Works (EJ).
3. Approved Equal.

2.02 PERFORMANCE/DESIGN CRITERIA

- A. Door leafs shall be reinforced to support a minimum live load of 300 psf or AASHTO H-20 wheel load with a maximum deflection of 1/150th of the span. See Floor Access Door Schedule at the end of this section, which indicates loading criteria required at each location.
- B. Nominal opening sizes and hinge opening side shall be as noted on the Drawings and in the Floor Access Door Schedule.

2.03 MATERIALS

- A. Access doors, single or double leaf: 1/4 inch minimum aluminum with diamond tread pattern; ASTM B632, 6061-T6.
- B. Channel frame shall be 1/4 inch minimum extruded aluminum with bent down anchor tabs around the perimeter: ASTM B221, 6061-T6.
- C. Hardware: ASTM A240 Type 316 stainless steel throughout.
- D. Fasteners:
 1. Bolts: ASTM F593
 2. Nuts: ASTM F594

2.04 COMPONENTS/ FEATURES

- A. Manufacturer shall provide the required number and size of compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled door leaf operation throughout the entire arc of opening; and to act as a check in retarding downward motion of the cover when closing.
- B. Spring tubes shall be constructed of a reinforced nylon 6/6-based engineered composite material. The upper tube shall prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe fastened to a formed 1/4 inch gusset support plate.
- C. Door leafs shall be equipped with a hold-open arm which automatically locks the door in the open position. A removable exterior turn/lift handle with a spring loaded ball detent shall be provided to open the door and the latch release shall be protected by a flush, gasketed, removable screw plug.
- D. A stainless steel snap lock with fixed handle shall be mounted on the underside of the door.

- E. Provide heavy forged aluminum hinges with 1/4 inch minimum diameter stainless steel pins.
 - 1. Hinges must operate in such a manner to prevent the door leafs from protruding into the channel frame.
 - 2. Design hinges specifically for horizontal installation.
 - 3. Hinges shall be through-bolted to the cover with tamperproof stainless steel lock bolts and through-bolted to the frame with stainless steel bolts and locknuts.
- F. A continuous ethylene propylene diene monomer (EPDM) gasket shall be mechanically attached to the aluminum frame to create a barrier around the entire perimeter of the cover and significantly reduce the amount of dirt and debris that may enter the channel frame.
- G. A 1.5 inch drain coupling shall be provided.
- H. Provide a recessed padlock hasp with flush hinged lid and fully welded receptacle that is designed and sized to receive a high security padlock.
- I. Provide a continuous EPDM odor resistant gasket along the inside edge of the frame. This gasket is in addition to the perimeter debris gasket.
- J. Provide safety chain made of non-corrosive material that will span across the corners of double leaf access doors when open. Coat safety chains with high visibility, fluorescent paint.
- K. Provide telescoping ladder safety posts for easy, safe ladder access through the access door openings.
 - 1. Material: Stainless steel.
 - 2. Telescoping post to be permanently mounted to the top two rungs of fixed ladders.
 - 3. Post must automatically lock in the fully raised position to provide the user with a firm and steady hand-hold.
 - 4. Post to have release lever that allows the post to be easily lowered to its retracted position.
- L. Provide a fall protection grating system where indicated in the Floor Access Door Schedule. Manufacturer shall install the grating system when the door is fabricated.
 - 1. Design Criteria: Meet OSHA 29 CFR 1910.23 requirements for fall protection.
 - 2. Grating panel material: Aluminum with powder coat paint finish.
 - 3. Grating panel color: High visibility OSHA safety yellow or orange.
 - 4. Grating panel shall lock automatically in the full open position.
 - 5. Grating panel shall lift open in the opposite direction as the door(s).
 - 6. Hold open feature: Stainless steel hold open device shall be provided to lock the cover in the fully open 90 degree position.

7. Lift mechanism and hardware: Stainless steel lifting mechanisms as specified above for all fall protection panels that weigh over 50 pounds.
8. Grating openings: Reinforced with easy-open aluminum covers for removal of instrumentation below access doors.

2.05 FINISHES

- A. Door and frame: Mill finish aluminum with heavy bituminous coating where in contact with concrete.
- B. Telescopic safety post: aluminum or stainless steel.
- C. Springs: Electro-coated acrylic finish.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates and openings for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Installation shall conform to the manufacturer's recommendations.
- B. Frame shall be accurately cast in place and securely anchored to concrete. Installation of access doors after concrete is placed is not allowed.
- C. Set frame level, plumb and in proper alignment with adjacent work.
- D. Contractor shall field route a 1.5 inch Schedule 80 PVC drain pipe from the 1.5 inch drain coupling on all access doors to the discharge location approved by OWNER. Place drain pipe clear of the access area below the door and as approved by the OWNER.

3.03 REPAIR/RESTORATION

- A. Repair finishes damaged during installation.
- B. Remove and replace doors that are warped, bowed, or otherwise damaged.

3.04 ADJUSTING

- A. Adjust doors and hardware after installation for proper operation.

3.05 CLEANING

- A. Clean exposed surfaces using methods acceptable to the manufacturer that will not damage finish.

3.06 FLOOR ACCESS DOOR SCHEDULE

Floor Access Doors						
Mark	Location/Room Number	Clear Opening Size (north/south x east/west) ¹	Leafs	Loadi ng	Fall Protecti on Grating	Comments
H-01	Square Aluminum Access Hatch	4'-0" x 4'-0"	Double	H-20	Yes	Manhole Access

Note:

1. *Clear opening is defined as the dimensions such that objects can pass through the floor access door. Lifting and other hardware shall be outside of the opening dimensions.*

END OF SECTION

SECTION 310000 - EARTHWORK

1.1 SUMMARY

- A. The Work covered by this Section shall include all excavation, trenching and related work for the construction of the designated structures and pipelines, backfill and other incidental work.
- B. The Work covered by this Section consists of:
 - 1. making all necessary excavations for the construction of all Work;
 - 2. preparing subgrade for foundations, slabs, walks, and pavements;
 - 3. doing all pumping, fluming, and dewatering necessary to keep the trenches and other excavation free from water;
 - 4. providing for uninterrupted flow of existing drains and sewers, and the disposal of water from any sources during the progress of the Work;
 - 5. supporting and protecting all trench walls, structures, pipes, conduits, culverts, posts, poles, wires, fences, buildings and other public and private property adjacent to the Work;
 - 6. removing and replacing existing sewers, culverts, pipelines and bulkheads where necessary;
 - 7. removing after completion of the Work all sheeting and shoring or other soil support materials not necessary to support the sides of trenches;
 - 8. removing and disposing all surplus excavated material;
 - 9. doing all backfilling and grading, of compacting backfill to limits specified or ordered by the Engineer;
 - 10. restoring all property damaged as a result of the Work involved in this Contract.
- C. The Work includes transporting surplus excavated materials not needed for backfill at the location where the excavation is made, to other parts of the Work where filling is required, and disposal of all types of surplus material off the site.
- D. The Work includes low strength mortar backfill material intended for use in backfilling as shown on the Drawings.
- E. The work shall include but is not limited to excavation of trenches for installation of manhole structures and sanitary sewer pipes, placement of subgrade or base materials for pavement and walk, and any earthwork activities related to improvements detailed in the plans.

1.2 RELATED DOCUMENTS AND SECTIONS

- A. Section 013319 – Field Testing Requirements
- B. Section 015713 – Temporary Erosion Control
- C. Section 030000 – Concrete Work

- D. Section 333100 – Sanitary Sewer System
- E. Cuyahoga County Department of Public Works “Uniform Standards for Sewage Improvements” dated 2019.

1.3 DEFINITIONS

- A. Backfill: Soil or granular materials used to fill an excavation.
 - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, not including haunches to support sides of pipe.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Bedding: Layer placed over the excavated subgrade in a trench before laying pipe.
- C. Borrow: Satisfactory soil imported for use as fill or backfill.
- D. Excavation: Removal and disposal of material encountered above subgrade or foundation elevations.
 - 1. Additional Excavation: Excavation below subgrade or foundation elevations as directed by Engineer.
 - 2. Trench: Narrow linear excavation
 - 3. Unauthorized Excavation: Excavation below subgrade or foundation elevations or beyond indicated dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.
 - 4. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface or subsurface conditions encountered, including rock, soil materials and obstructions.
- E. Embankment: A structure consisting of soil, granular material, shale, rock, or other approved material, constructed in layers to a predetermined elevation and cross-section.
- F. Granular materials: Natural aggregate, such as broken or crushed rock, gravel, or sand that can be readily incorporated into an 8-inch layer, and in which at least 65% by weight of the grains or particles are retained in a No. 200 sieve.
- G. Laboratory Dry Weight: The maximum laboratory dry weight shall be the weight provided by the laboratory when the sample is tested in accordance with ASTM D-698 Method A, C, or D.
- H. Optimum Moisture: The water content at which the maximum density is produced in a soil by a given compaction effort (ASTM D-698).
- I. Pavement Prism: Also referred to as the zone of influence. The area below a line drawn 45 degrees to the horizontal from the surface at the edge of pavement, sidewalk or curb.

- J. Pipe Embedment: The material placed in a trench surrounding a pipe or conduit consisting of the foundation, bedding, haunching, and initial backfill.
- K. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material one (1) cu. yd. or more in volume that when tested by an independent geotechnical testing agency, according to ASTM D 1586, exceeds a standard penetration resistance of 100 blows/2 inches.
- L. Shale: Laminated material, formed by the consolidation in nature of soil, having a finely stratified structure. For the purpose of these specifications, the following bedrock types shall also be considered shale: mudstone, claystone, siltstone and hard clay.
- M. Soil: All earth materials, organic or inorganic, which have resulted from natural processes such as weathering, decay, and chemical reaction.
- N. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, pavement, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- O. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage course, or topsoil materials.
- P. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

- A. Comply with all provisions of Section 013323, Shop Drawings and Submittals.
- B. Product Data: For the following:
 - 1. Source-locations of all materials shall be identified to the Engineer.
 - 2. Source quality laboratory test of all fill materials as required to show compliance with material specifications.
- C. Shop Drawings: Submit information for the following items as necessary to meet the project requirements:
 - 1. Sheeting and bracing (prepared and stamped by a professional engineer, registered in the State of Ohio).
 - 2. Dewatering system and standby equipment (prepared and stamped by a professional engineer, registered in the State of Ohio).
 - 3. Protection methods anticipated (prepared and stamped by a professional engineer, registered in the State of Ohio).
 - 4.
 - 5. Excavation procedures (prepared and stamped by a professional engineer, registered in the State of Ohio).

1.5 REFERENCES

- A. AASHTO M 43 Standard Specification for Size of Aggregate for Road and Bridge Construction
- B. ASTM C-150 Standard Specification for Portland Cement
- C. ASTM C-618 Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
- D. ASTM D-698 Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5-lb (2.49-kg) Rammer and 12-in. (305-mm) Drop
- E. ASTM D-1586 Standard Method for Penetration Test and Split-Barrel Sampling of Soils
- F. ASTM D-2487 Standard Test Method for Classification of Soils for Engineering Purposes
- G. ASTM D-2940 Standard Specification for Graded Aggregate Material for Bases or Subbases for Highways or Airports
- H. ASTM D-4253 Standard Test Method for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
- I. ASTM D-4254 Standard Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density
- J. State of Ohio - Department of Transportation - Construction and Material Specifications, Item 304, Aggregate Base.
- K. State of Ohio - Department of Transportation - Construction and Material Specifications, Material Detail 703.16, Suitable Materials for Embankment Construction.
- L. State of Ohio - Department of Transportation - Construction and Material Specifications, Material Detail 703.02.A.2, Fine Aggregate for Portland Cement Concrete

1.6 QUALITY ASSURANCE

- A. Qualifications - Work shall be performed by personal meeting requirements identified in section 014323 – Qualifications of Tradesmen.
- B. Regulatory Requirements – The project is subject to the Build America, Buy American Act (BABA). All materials used for earthwork shall be in accordance with the requirements set forth in BABA.

- C. Certifications – The Contractor shall provide certification that all materials meet requirements identified in plans, specifications, and bid/contract documents.
- D. Field Samples – All testing of native soils, bedding and backfill materials, and pavement base materials shall be in accordance with requirements identified in section 013319 – Field Test Reporting.
- E. Pre-Construction Meeting – The Contractor, Engineer, and Owner shall meet at a minimum ten (10) business days prior to the mobilization of equipment and materials to the project site. No work shall commence until a pre-construction meeting is held and the work plan by the Contractor is approved by the Engineer.

1.7 PROJECT CONDITIONS

- A. Environmental Requirements
 - 1. All excavation work shall be performed in accordance with erosion control and stormwater pollution prevention measures detailed in section 015713 – Temporary Erosion Control.
- B. Existing Conditions
 - 1. Existing ground elevations of the site are shown by figures and/or by contours on the Drawings. The contours and elevations of the present ground are believed to be reasonably correct, but do not purport to be absolutely so, and, together with any schedule of quantities, are presented only as an approximation. The Contractor shall satisfy themselves, however, by actual examination on the site of the Work, as to the existing elevations and contours, and the amount of work required.
- C. Existing Utilities
 - 1. Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Engineer and then only after arranging to provide temporary utility services according to requirements indicated.
 - 2. Notify Engineer not less than 48 hours in advance of proposed utility interruptions.
 - 3. Do not proceed with utility interruptions without Engineer's written permission.
 - 4. Contact utility-locator service for area where Project is located before excavating.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to the site, store and protect under provisions of Section 016600 - Product Handling and Protection.
- B. Comply with all provisions of Section 013543 - Environmental Protection.

1.9 SEQUENCING AND SCHEDULING

- A. Refer to 013319 for testing laboratory service scheduling.

1.10 PROHIBITION OF EXPLOSIVES

- A. The use of explosives is not permitted.

1.11 FIELD MEASUREMENTS

- A. The Contract Drawings may indicate locations where certain utilities, structures or facilities might possibly interfere with the installation of new improvements. The Contractor shall dig such exploratory test pits as may be necessary to determine the exact location and elevation of the indicated subsurface structure and shall make acceptable provision for their protection, support and maintenance in operation. The Engineer shall be provided advance notification when and where excavation for test pits will take place. The Contractor shall provide the Engineer a record of field locations of all listed utilities, structures or facilities a minimum of five (5) business days prior to initiating construction of the project. Locations and elevations are to be provided by a Surveyor registered in the State of Ohio.

PART 2 - PRODUCTS

2.1 GRANULAR PIPE EMBEDMENT

- A. Crushed gravel or crushed limestone meeting AASHTO M 43 gradation shall be used for bedding, haunching, and initial backfill as shown on the Drawings.

2.2 ONSITE BACKFILL

- A. Excavated soil material, capable of meeting specified compaction, and approved by the Engineer for use as backfill in designated locations.
- B. Based upon subsurface investigation, the Owner does not guarantee the onsite soils in its present state consists of the proper moisture content to achieve the specified compaction without drying or adding water.
- C. Unsuitable Backfill Material
 - 1. Onsite materials that are unsuitable for backfill, unless otherwise specifically shown in the Drawings, include rock or other materials greater than six (6) inches in their largest dimension, pavement, rubbish, debris, wood, metal, plastic, frozen earth, and the following soils classified per ASTM D-2487:

Symbol	Description
OL	Organic silts and organic silty clays of low plasticity
MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
CH	Inorganic clays of high plasticity, fat clays
OH	Organic clays of medium to high plasticity
PT	Peat, muck, and other highly organic soils

2.3 SPECIAL BACKFILL MATERIAL (ODOT Item 304)

- A. Special backfill material shall meet the gradation requirements of ODOT Item 304 and shall consist of crushed gravel or crushed limestone in combination with natural sand or stone. The aggregate shall meet the following gradation requirements:

Sieve	Total Percent Passing
2 inch	100
1 inch	70-100
$\frac{3}{4}$ inch	50-90
No. 4	30-60
No. 30	9-33
No. 200	0-15

2.4 LOW STRENGTH MORTAR BACKFILL

- A. Low Strength Mortar shall comply with Cleveland Low Strength Mortar Backfill as detailed in section 5.205.B of the Uniform Standards for Sewage Improvements
- B. Cleveland Low Strength Mortar Backfill shall use ASTM C150 Type 1 cement and conform to the ODOT CMS 613, Type 2 requirements.
- C. Fine aggregate shall conform to ODOT CMS 703.03.
1. Use of foundry sand, core sand, or fly ash is prohibited.
- D. Approved admixtures shall include Rheofill by Master Builders, Flow Air by Axim, or Darafill by W.R. Grace.
- B. Submit test data that demonstrates that the proposed mix has a strength of 50 to 80 PSI at 28 days.
- C. Each load shall be tested with 3 cylinders for strength test broken at 3, 7, and 28 days until the Engineer is assured that the mix will be between 50 to 80 PSI at 28 days. Thereafter, one set of strength tests shall be taken every 50 CY.
- D. It is intended that the sand be fine enough to stay in suspension in the mixture to the extent required for proper flow. The Engineer reserves the right to reject the sand if a flowable mixture cannot be produced.

- E. Mortar Mix Proportioning
1. LSM Mix Design

<u>Ingredient</u>	<u>Proportion</u>
Cement (Type 1)	50 lbs/cy
Fine Aggregate	2,475 lb/cy
Water	25 gal/cy
Admixture	3 oz./cy

2.5 ENGINEERED FILL

- A. Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940. The aggregate shall meet the following gradation requirements:

<u>Sieve</u>	<u>Total Percent Passing</u>
2 inch	100
1½ inch	95-100
¾ inch	70-92
3/8 inch	50-70
No. 4	35-55
No. 30	12-25
No. 200	0-8

2.6 ACCESSORIES

- A. Detectable Warning Tape
1. Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
 - a. Red: Electric.
 - b. Yellow: Gas, oil, steam, and dangerous materials.
 - c. Orange: Telephone and other communications.
 - d. Blue: Water systems.
 - e. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PROTECTION

- A. Excavation; Temporary Sheet piling, Shoring, and Bracing
1. All excavation shall be in accordance with the Occupational Safety and Health Administration (OSHA) regulations.

2. The Contractor shall furnish and install adequate sheeting, shoring, and bracing to maintain safe working conditions, and to protect newly built work and all adjacent neighboring structures from damage by settlement.
 3. Bracing shall be arranged so as not to place a strain on portions of completed work until construction has proceeded enough to provide ample strength. Sheeting and bracing may be withdrawn and removed at the time of backfilling, but the Contractor shall be responsible for all damage to newly built work and adjacent and neighboring structures.
 4. All sheeting shall be removed unless specifically authorized in writing by the Engineer to be left in place.
- B. Construction Sheeting Left in Place
1. The Contractor shall furnish, install, and leave in place construction sheeting and bracing when specified or when indicated or shown on the Drawings.
 2. Any construction sheeting and bracing which the Contractor has placed to facilitate his work may be ordered in writing by the Engineer to be left in place. The right of the Engineer to order sheeting and bracing left in place shall not be construed as creating an obligation on his part to issue such orders. Failure of the Engineer to order sheeting and bracing left in place shall not relieve the Contractor of his responsibility under this Contract.

3.2 REPLACING, MOVING AND REPAIRING OF EXISTING UTILITIES

- A. The Contractor shall:
1. Replace, move, repair and maintain all utilities and all other structures encountered in the work
 2. Coordinate and communicate with applicable utility companies
 3. Repair all damage done to any of the said structures and appurtenances through his acts or neglect and shall keep them in repair during the life of this contract. The Contractor shall in all cases leave them in as good condition as they were previous to the commencement of the work and to the satisfaction of the Engineer.

3.3 DEWATERING

- A. Drainage and Removal of Water
1. The Contractor shall dispose of water from the Work in a suitable manner without damage to adjacent property or structures.
 2. The Contractor shall, when ordered by the Engineer, construct tight bulkheads across trench and provide pumps suitable for the removal of any water which may be encountered or which may accumulate in the trenches. Unless otherwise provided for in the Contract Documents, drainage water will not be permitted to flow through the conduit.
 3. The trench shall be kept free from sewage and storm, surface, and subsurface water to at least 2 feet below the bottom of the excavation.
 4. Where open water courses, ditches, or drain pipes are encountered during the progress of the Work, the Contractor shall provide protection and securing of the continuous flow in such courses or drains and shall repair any damage that may be done to them.

3.4 EXCAVATION CLASSIFICATION

- A. All excavated materials are unclassified as defined in Article 1.3.

3.5 GENERAL EXCAVATION

- A. All necessary excavation for buildings, structures, pavements, and site improvements shall be performed to accommodate the completion of all related Contract Work.
- B. The Drawings show the horizontal and the lower limits of structures. The methods and equipment used by the Contractor when approaching the bottom limits of excavation shall be selected to provide a smooth surface and to prevent disturbing the soil below the bottom limits of excavation. All soil loosened during excavation shall be removed from the bottom of the excavation.
- C. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 feet, and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.
- D. Excavation which is carried below the bottom limits of structures shall be classified as Unauthorized Excavation, unless said excavation below bottom limits of structures has been authorized by the Engineer prior to each occurrence.
- E. Unauthorized Excavation shall be filled with Class B concrete to the bottom limits of structures. Under circumstances where structural integrity is not a factor, the Engineer may authorize the filling of Unauthorized Excavation with Low Strength Mortar Backfill or Special Backfill material compacted to 100% density as specified under the compaction requirements in this Section. Such work shall be at the cost of the Contractor.

3.6 TRENCH EXCAVATION

- A. Excavation for trenches in which pipelines, sewers, and conduits are to be installed shall provide adequate space for workmen to space and joint pipe properly, but in every case the trench shall be kept to a minimum width. The width of trench shall not exceed the limits shown on the Drawings.
- B. Excavation shall be to the depth necessary for placing of granular bedding material under the pipe as shown on the Drawings. If over-excavation occurs, the trench bottom shall be filled to grade with compacted granular bedding material.
- C. Trenching operations shall not be performed beyond the distance that will be backfilled and compacted the same day.
- D. In general, backfilling shall begin as soon as the conduit is in approved condition to receive it and shall be carried to completion as rapidly as possible. New trenching shall not be started when earlier trenches need backfilling or the surfaces of streets or other areas need to be restored to a safe and proper condition.

3.7 EXCAVATION OF UNSUITABLE MATERIALS

- A. Unsuitable materials existing below the Contract bottom limits for excavation shall be removed as directed by the Engineer. Such excavation shall not exceed the vertical and lateral limits as prescribed by the Engineer.
- B. In utility trenches, the voids left by removal of unsuitable excavated material shall be filled with AASHTO M 43 No. 1 and No. 2 aggregate conforming to the material requirements of Article 2.1 of this Section.
- C. In excavations other than utility trenches, the voids left by removal of unsuitable excavated material shall be filled with material consisting of either: (1) Special Backfill Material; (2) Class B concrete; or (3) Low Strength Mortar Backfill, whichever is ordered by the Engineer.
- D. Removal of unsuitable excavated material and its replacement as directed will be paid on basis of Contract Conditions relative to Changes in Work unless specific unit prices have been established for excavation of unsuitable material.

3.8 DISPOSAL OF UNSUITABLE AND SURPLUS MATERIAL

- A. It shall be the responsibility of the Contractor to dispose of all surplus material that cannot be used in backfill or embankments at their expense outside the limits of the project. Unsuitable excavated material, including rock or large boulders, shall be disposed of outside the limits of the project.
- B. Surplus material may be wasted adjacent to or incorporated in the regular construction only when ordered in writing by the Engineer.

3.9 BACKFILL

- A. Pipelines, Sewers and Conduits
 - 1. All pipe shall have bedding extending the width of the trench with depth in conformance with the Drawings. The bedding material shall be thoroughly compacted by tamping until no further densification is possible.
 - 2. Pipe cover material shall be used for filling above the pipe bedding along the sides of the pipe and to a height of twelve (12) inches over the top of the pipe. The pipe cover material shall be brought up evenly on both sides of the pipe to eliminate the possibility of lateral displacement of the pipe and shall be thoroughly compacted by tamping until no further densification is possible. Care shall be taken to spade the aggregate under the pipe haunch below the spring line.
 - 3. All trenches and excavations shall be backfilled immediately after pipe is laid therein, unless otherwise directed by the Engineer.
 - 4. After the pipe cover has been placed and compacted around the pipe as specified above, the remainder of the trench may be backfilled by machine. The backfill material shall be deposited in eight (8) inch horizontal layers, and each layer shall be thoroughly compacted to the specified density by approved methods before a succeeding layer is placed. In no case will

backfilling material from a bucket be allowed to fall directly on a pipe and in all cases the bucket must be lowered so that the shock of the falling earth will not cause damage.

B. Structures

1. Backfilling shall not commence before concrete has attained specified strength. Do not use equipment for backfilling and compaction operations against structures that will overload the structure.
2. Backfilling around and over structures shall be carefully placed and tamped with tools of suitable weight to a point one (1) foot above the top of same. Additional backfill may be required to protect the structure from damage from heavy equipment. Backfill shall be placed in uniform layers not exceeding eight (8) inches in depth. Each layer shall be placed, then carefully and uniformly compacted to the specified density so as to eliminate the possibility of displacement of the structure.
3. After the backfill has been placed and compacted around the structure to the height specified above, the remainder may be backfilled by machine. The backfill material shall be deposited in eight (8) inch horizontal layers, and each layer shall be thoroughly compacted to the specified density by approved methods before a succeeding layer is placed. In no case will backfilling material from a bucket be allowed to fall directly on a structure, and in all cases the bucket must be lowered so that the shock of the falling earth will not cause damage.

C. Where any new, proposed, or future pavement, driveway, parking lot, curb, curb and gutter, or walk is to be placed over a backfilled area, Special Backfill material shall be used for any portion of the trench falling within the pavement prism. Low Strength Mortar (LSM) as specified in Article 2.5, may be used as an alternate to Special Backfill.

D. Where it is necessary to undercut or replace existing utility conduits and/or service lines, the excavation beneath such lines shall be backfilled the entire length with approved Granular Pipe Embedment Material compacted in place in eight (8) inch layers to the required density. The approved Granular Pipe Embedment Material shall extend outward from the spring line of the conduit a distance of two (2) feet on either side and thence downward at its natural slope.

3.10 LOW STRENGTH MORTAR BACKFILL

- A. Low strength mortar backfill shall be discharged from the mixer as recommended by the supplier and approved by the Engineer.
- B. Low strength mortar backfill placement shall begin 12 inches above the top of the pipe and continue to the bottom of pavement base material or 36 inches below the top of ground in unpaved areas that are within the zone of influence of pavement.
- C. Low strength mortar backfill may be placed in the trench in as few lifts as may be practical.

- D. Secure conduit or pipelines before placing low strength mortar backfill to prevent conduits and pipelines from floating during backfilling.
- E. For low strength mortar backfill placed against existing structures of unknown strength, backfill material shall be brought up uniformly in maximum 12 inch lifts and allowed to cure for a minimum of 24 hours or until it can carry a person's weight without leaving imprints before the next lift is placed.

3.11 SUBGRADE

- A. All soil subgrade shall be prepared in accordance with this subsection.
- B. Drainage
 - 1. The surface of the subgrade shall be maintained in a smooth condition to prevent ponding of water after rains to insure the thorough drainage of the subgrade surface at all times.
- C. Unsuitable Subgrade
 - 1. Where unsuitable subgrade or subgrade not meeting the required bearing capacity is encountered in cuts, due to no fault or neglect of the Contractor, in which satisfactory stability cannot be obtained by moisture control and compaction, the unstable material shall be excavated to the depth required by the Engineer.
 - 2. Suitable material required for the embankment to replace the undercut will be paid on basis of Contract Conditions relative to changes in Work.
 - 3. Where soft subgrade in cuts is due to the failure of the Contractor to maintain adequate surface drainage as required in this article, or is due to any other fault or neglect of the Contractor, the unstable condition shall be corrected as outlined above at no expense to the Owner.

3.12 CONSTRUCTION WITH MOISTURE AND DENSITY CONTROL

- A. All backfill and embankments, except rock embankments, shall be constructed using moisture and density control. All subgrade, except rock and shale in cut sections, shall be constructed using moisture and density control.
- B. Backfill, embankment and subgrade material which does not contain sufficient moisture to be compacted in accordance with the requirements of Article 3.13 of this Section shall be sprinkled with water as directed by the Engineer to bring the moisture content to within the range of optimum plus or minus three (3) percent. Water shall be thoroughly incorporated into the material by means of discs or other approved equipment.
- C. Backfill, embankment and subgrade material containing excess moisture shall be dried, prior to installation, to a moisture content not greater than three (3) percentage points above optimum, except that for material within the moisture content range specified herein that displays pronounced elasticity or deformation under the action of loaded construction equipment, the moisture content shall be reduced to optimum

or below if necessary to secure stability. For subgrade material, these requirements for maximum moisture shall apply at the time of compaction of the subgrade and also at the time of placing pavement or subbase. Drying of wet soil shall be expedited by the use of plows, discs, or by other approved methods when so ordered by the Engineer.

3.13 COMPACTION REQUIREMENTS

- A. The bottom of excavations upon which concrete foundations or structures are to be placed shall be compacted so as to obtain 100% of maximum dry density per ASTM D-698 in the top twelve (12) inches.
- B. The top twelve (12) inches of stripped original subgrade and final subgrade shall be compacted to not less than 100% of maximum dry density per ASTM D-698.
 - 1. Subgrade under new, proposed, or future pavement shall be compacted 18 inches beyond the edge of pavement, paved shoulders or paved medians.
- C. Compaction of subgrade for sidewalks (regardless of paving material) shall be 100% of maximum dry density per ASTM D-698 in the top six (6) inches.
- D. Compaction of non-paved areas shall be 90% of maximum dry density per ASTM D-698.
- E. Aggregate pipe embedment and aggregate backfill around structures shall be compacted to not less than 100% of maximum dry density per ASTM D-4253 and ASTM D-4254.
- F. Final backfill shall be compacted to not less than 100% of maximum dry density per ASTM D-698.
- G. Fill placed within the interior of structures shall be compacted to not less than 100% of maximum dry density per ASTM D-698.
- H. Embankment shall be placed and compacted in layers until the density is not less than the percentage of maximum dry density indicated in the following table determined by ASTM D-698.

3.14 GRADING

- A. Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading

1. Slope grades to direct water away from buildings and to prevent ponding.
Finish subgrades to required elevations within the following tolerances:
 - a. Lawn or unpaved areas shall be graded to plus or minus 1 inch
 - b. Walks shall be graded to plus or minus 1 inch

C. Grading inside Building Lines

1. Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

END OF SECTION 310000

SECTION 321000- PAVEMENT REPLACEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. The Contractor shall furnish all of the equipment, labor and materials necessary to install, replace, and/or restore existing pavement structures together with their respective appurtenances as shown on the plans and as specified herein. This work shall include all of the subgrade preparation, subbase, base, intermediate pavement course(s), and finish pavement courses together with curbing, guttering, tack and/or prime coating, sealing and other pertinent work as necessary to meet the conditions of this contract.

1.3 QUALITY ASSURANCE

- A. In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work.

1.4 REPAIR OR REPLACEMENT WORK

- A. For the repair and/or replacement of all existing pavement structures and their respective appurtenances that are removed and destroyed or otherwise damaged by the Contractor in the course of his performance of the work required under this contract, the Contractor shall furnish all equipment, labor, and materials as necessary to properly restore to a condition equal to that at his entry, and to the satisfaction of the Engineer, the Ohio Department of Transportation, the County Engineer, City Engineer, all cinder, slag, gravel, water-bound macadam, bituminous macadam, asphalt and brick or concrete driveways, curbs, sidewalks and roadways in strict accordance with the drawings and as specified herein.
- B. In general, this item will include concrete, steel reinforcement, brick, stone, slag, cinders, gravel, asphalt and other bituminous materials and curbs, gutters, driveway culverts, road and curb drains and the demolition, excavation and removal of existing driveways, sidewalks and roadways.

1.5 REFERENCE TO OTHER PARTS

- A. Other sections of these specifications shall apply, as and where applicable to this section and such sections will be the same as though they were included in this section.
- B. For all old work where pavement is being repaired and/or replaced as a result of damages occurring thereto during the course of the work of this contract, all clearing and grubbing, removal and storage of topsoil, excavation and/or placing of compacted fill and granular backfill, shall be done as required under other parts of these specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Generally, for all repair and replacement work, all new materials shall match the existing and adjoining work in both composition and quality unless otherwise ordered, specified herein, and/or shown on the drawings. In any stone driveway or roadway, the material used for stone fill shall conform to the existing material.

PART 3 - EXECUTION

3.1 CONSTRUCTION

- A. All pavement work shall be done in strict accordance with the specifications of the governmental body concerned and the latest ODOT specifications as applicable or at the direction of the Engineer.
- B. All pavements disturbed by the Contractor's operations shall be relaid to the thickness of the adjoining pavement and, in all cases, the restoring of pavements, shall apply both to foundation courses and to the wearing surface.
- C. Should cracks or settlements appear in adjoining pavements, the paving shall be removed to the extent necessary to secure firm and undisturbed bearing and shall be replaced in a satisfactory manner.
- D. No permanent pavement shall be installed, repaired, and/or restored unless, or until, in the opinion of the Engineer, the condition of the backfill is such as to properly support the pavement.
- E. Where new or replacement concrete pavement or base is placed adjacent to existing concrete pavement or base, contraction joints shall be provided in the new or replacement pavement so as to form a continuous joint with that in the existing pavement.

3.2 ROADWAY SUBGRADE

- A. The entire area to be occupied by the roadways and parking areas shall be cleared, topsoil removed and stored, and the excavation or compacted fill made as required and brought to the proper cross-sections. Pipe trenches and other excavations shall be backfilled as required, and thoroughly compacted within the limits of the roadways or parking areas.
- B. After the surface of the subgrade has been properly shaped and before any stone or slag is placed, the entire subgrade shall be thoroughly rolled and compacted to a depth of 12 inches under this section. Rolling shall be done with an approved type of self-propelled roller, weighing not less than ten (10) tons. All hollows and depressions which develop during the rolling shall be filled with acceptable materials, and the subgrade rerolled. The process of filling and rolling shall be repeated until no depressions develop, and the entire subgrade has been brought to a uniform condition of stability.

- C. All places which, in the opinion of the Engineer cannot be properly rolled, shall be tamped with handheld mechanically or pneumatically powered tampers.
- D. In making the compacted fill and in doing the final subgrade rolling, the Contractor shall see that the material to be compacted and/or rolled has the proper moisture content to secure maximum compaction. When, in the opinion of the Engineer, the material is too wet, the compacting shall be delayed until the material has dried sufficiently. When, in the opinion of the Engineer, the material is too dry, the material shall be sprinkled with water in an amount to secure the proper moisture content.

END OF SECTION 321000

SECTION 321623 - CONCRETE WALKS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Under this section the Contractor shall furnish and construct sidewalks and stairs as shown or scheduled on the Drawings, specified or directed.
- B. This section includes preparation of the base and/or subgrade construction of walks, adjustment of manhole castings and valve boxes to conform to new elevations and other work and materials incidental to the construction of walks and stairs.

1.3 OWNER'S STANDARDS AND SPECIFICATIONS

- A. Items preceded by ODOT shall refer to the latest edition of the State of Ohio, Department of Transportation, Construction and Material Specifications.

PART 2 - PRODUCTS

2.1 CONCRETE

- A. All concrete used shall be Class QC 1 as specified in section 030000.

2.2 WALKS

- A. Other materials for walks shall meet the applicable requirements of ODOT Item 608.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Compaction shall follow mixing as closely as conditions permit. Should the mixture be unstable under the rollers due to excess moisture, the Engineer may require the mixture to be aerated using the in-place mixer to reduce the moisture content. Compaction requirements shall be as provided in ODOT 304.04 and 304.05 except that water shall not be applied.
- B. All service boxes, manholes and inlet tops shall be set to the required grades.

- C. All construction for walks shall be in accordance with ODOT Item 608 for the type called for on the Drawings.
- D. Minimum thickness of concrete walks shall be 4 inches.

END OF SECTION 321623

SECTION 329200.19 – SEEDING AND MULCHING

PART 1 - GENERAL

1.1 SUMMARY

- . Installation of seeded areas shall be to the extent shown on Contract Drawings and shall include supplying all seed, topsoil, soil conditioning materials, mulching materials and watering, and the incorporation of these materials into the work as specified.
- A. The Contractor shall place topsoil at the depths specified in those areas requiring seeding. Topsoil shall be furnished by the Contractor.

1.2 SUBMITTALS

- A. Product Data: For the following:
 - 1. Provide copies of soils tests for both new topsoil (provided) and onsite topsoil for review and approval. This applies to all areas that require seeding, including reconditioned areas.
 - 2. Provide location of properties from which topsoil is to be obtained, names and addresses of owners, depth to be stripped, and crops grown in the past 2 years.
 - 3. Provide the name of the seed supplier, name and phone number, list of the seed, including varieties of seed, labels, and an analysis of the seed for review, 4 weeks prior to the start of seeding.
 - 4. Provide soil amendments information based on soils test requirements.
 - 5. Hydroseed mixture, mulch and application rates prior to performing the work.

1.1 QUALITY ASSURANCE

- A. Any subcontracted restoration work shall be performed by a qualified firm specializing in landscape work.
- B. The Contractor shall have a soils test done at his expense and analyzed by a state approved testing agency. Soil tests shall be done on both the topsoil stockpiled from the site and new topsoil brought to the site. A minimum of two (2) tests shall be done. The tests shall include percent organic matter, pH, Buffer pH, Phosphorus, Exchangeable Potassium, Calcium, Magnesium, Cation Exchange Capacity and Percent Base Saturation with recommendations for nitrogen, phosphate, potash, magnesium and lime based on plant type and use.
- B. Seed: All seed specified shall meet O.D.O.T. specifications as to the percentage purity, weed seed, and germination. All seed shall be approved by the State of Ohio, Department of Agriculture, Division of Plant Industry, and shall meet the requirements of these specifications.

- D. Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site.

1.4 PROJECT CONDITIONS

- B. Utilities: Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand excavate, as required. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
- C. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, such conditions shall be rectified by the Contractor before planting, with approval from the Owner's Representative.
- D. Soil Stabilization: The Contractor shall provide permanent or temporary soil stabilization to denuded areas within fifteen (15) days after final grade is reached on any portion of the site. Any such area which will not be regraded for longer than fifteen (15) days shall also be stabilized. Soil stabilization includes any measures which protect the soil from the erosive forces of raindrop impact and flowing water. Applications include seeding and/or mulching, or the use of other erosion control measures as directed by the Owner's Representative. If necessary, the Contractor shall coordinate soil stabilization practices with the local Soil and Water Conservation District.
- D. Spring-sown work shall be installed between April 1st and May 30th and Fall-sown work shall be installed between September 1st and October 15th. No permanent seeding shall take place between May 30th and September 1st and between October 15th and April 1st. The dates for seeding may be changed at the discretion of the Owner's Representative.

PART 2 - PRODUCTS

2.1 TOPSOIL

- A. Topsoil shall be furnished by the Contractor. Stockpiled material, if any, shall be utilized prior to obtaining additional topsoil.
- B. All topsoil shall conform to the U.S. Department of Agriculture soil texturing triangle and shall contain between 3% to 8% organic matter. Topsoil shall be loamy and not consist of more than 38% clay. New topsoil shall be screened to remove clay lumps, brush, weeds, litter, roots, stumps, stones larger than ½" in any dimension and any other extraneous or toxic matter harmful to plant growth.

New topsoil shall be obtained only from naturally well drained sites where topsoil occurs in a depth of not less than 4". Do not obtain from bogs or marshes.

- C. Soil amendments shall be added according to the soils test requirements. Amendments can include, but are not limited to fertilizer, lime, compost, sand, and organic matter. Organic matter shall consist of composted leaves or other approved material.

2.2 SEED

- A. Seed shall be vendor mixed, delivered in original bags and shall be proportioned as follows:

<u>Common Name</u>	<u>Proportion by Weight</u>
Kentucky Blue Grass	50%
Perennial Rye	50%

2.3 MULCH

- A. Mulch shall be clean straw free of seed and weed seed.
1. Anchoring for mulch shall be an ODOT specified SS-1 at 60 gal./ton non-toxic tackifier such as Hydro-stik, or equal, or by securing with a photo degradable netting.
- B. If hydroseeding is used, wood fiber mulching material shall be used and shall consist of virgin wood fibers manufactured expressly from whole wood chips and shall conform to the following specifications.

- Moisture content	10.0% \pm 3.0%
- Organic content	99.2% \pm 0.8% O.D. Basis
- pH	4.8 \pm 0.5
- Water holding capacity, minimum (grams of water per 100 grams of fiber)	1,000

Wood fiber mulching material shall be processed in such a manner as to contain no growth or germination inhibiting factors and must contain a biodegradable green dye to aid in visual metering during application.

PART 3 - EXECUTION

3.1 PREPARATION - GENERAL

- A. Rough grading to a depth necessary to accept the specified thickness of topsoil must be approved prior to placing topsoil.
- B. Loosen subgrade, remove any stones greater than 1/2" in any dimension. Remove sticks, roots, rubbish, and other extraneous matter.
- C. Spread topsoil to a minimum depth of 4 inches, to meet lines, grades, and elevations shown on plan, after light rolling and natural settlement. Remove sticks, roots, rubbish, stones greater than 1/2" in any dimension, and other extraneous matter. Topsoil shall be tilled thoroughly by plowing, disking, harrowing, or other approved methods. Add specified soil amendments and mix thoroughly into the topsoil.

- D. Preparation of Unchanged Grades: Where seed is to be planted in areas that have not been altered or disturbed by excavating, grading, or stripping operations, prepare soil for planting as follows: Till to a depth of not less than 6 inches. Apply soil amendments and initial fertilizers as specified. Remove high areas and fill in depressions. Till soil to a homogenous mixture of fine texture, free of lumps, clods, stones, roots and other extraneous matter. Soils test requirements apply here as well.
1. Prior to preparation of unchanged areas, remove existing grass, vegetation and turf. Dispose of such material outside of project limits. Do not turn existing vegetation over into soil being prepared for seed.
 2. If necessary, supply and install topsoil in areas where there is no topsoil left after vegetation has been removed.
 3. Apply specified soil amendments at rates specified in the soils test and thoroughly mix into upper 2 inches of topsoil. Add topsoil if existing grade has less than 4" of topsoil. Delay application of amendments if planting will not follow within two (2) days.
- E. Fine grade areas to smooth, even surface with loose, uniformly fine texture. Roll, rake, and drag lawn areas, remove ridges and fill depressions, as required to meet finish grades. Remove sticks, roots, rubbish, stones greater than 1/2" in any dimension, and other extraneous matter. Limit fine grading to areas which can be planted immediately after grading.
- F. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.
- G. Restore areas to specified condition, if eroded or otherwise disturbed, after fine grading and prior to planting.

3.2 SEEDING

- A. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage. Seed shall not be sown when the ground is frozen, muddy, or when weather conditions prevent proper soil preparation, interference with sowing and/or proper incorporation of seed into the soil.
- B. Sow seed using a spreader or hydroseeder. Do not seed when wind velocity exceeds 5 miles per hour. Distribute seed evenly over entire area by sowing 3 lbs. per 1000 S.F. at right angles to each other. Total amount to equal a minimum of 6 lbs. per 1000 S.F.
- C. For seed sown with a spreader, mulch shall be spread uniformly to form a continuous blanket at a rate of 100 lbs. per 1,000 S.F. Mulch shall be 1 1/2" loose measurement over seeded areas and shall be anchored.
- D. Contractor has the option to hydroseed large lawn areas, using equipment specifically designed for such application. The rate of application of wood fiber mulching materials is 40 lbs./1,000 S.F. Contractor shall not hydroseed within close proximity to buildings and structures, or when unfavorable wind conditions may blow the hydroseed material onto the structure. Contractor shall clean all areas not to be seeded of overspray.

- E. The seeded area shall be watered, as soon as the seed is applied, at the rate of 120 gallons per 1000 square feet. The water shall be applied by means of a hydroseeder or a water tank under pressure with a nozzle that will produce a spray that will not dislodge the mulching material. Cost of this watering shall be included in the cost of seeding and mulching.

3.3 DORMANT SEEDING METHOD

- A. Seeding shall not take place from October 15 through November 20. During this period prepare the seed bed, add the required amounts of lime and fertilizer, and other amendments, then mulch and anchor.
- B. From November 20 through April 1, when soil conditions permit, prepare the seed bed, lime and fertilize, apply the selected seed mixture, mulch, and anchor. Increase the seeding rate by 50 percent.

3.4 RECONDITIONING EXISTING LAWNS

- A. A soils test shall be required for existing lawns prior to any reconditioning.
- B. Recondition all existing lawn areas damaged by Contractor's operations including storage of materials and equipment and movement of vehicles. Also recondition existing lawn areas where minor regrading is required.
- C. Provide soil amendments as called for in the soils test.
- D. Provide new topsoil, as required, to fill low spots and meet new finish grades.
- E. Cultivate bare and compacted areas according to the topsoil specifications.
- F. Remove diseased and unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from the Contractor's operations, including oil drippings, stone, gravel, and other loose building materials.
- G. All work shall be the same as for new seeding.
- H. Water newly planted seed areas. Maintenance of reconditioned lawns shall be the same as maintenance of new lawns.

3.5 ESTABLISHMENT

- A. Maintain work areas as long as necessary to establish a uniformly close stand of grass over the entire lawn area. A uniformly close stand of grass is defined as the seeded areas having 90%+ coverage of grass at 60 days after seeding. 90%+ coverage is defined as very little or no dirt showing when seeded area is viewed from directly overhead.

- B. Maintain lawns by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, regrading and replanting as required to establish a smooth acceptable lawn.
1. Mowing
 - a. Mow lawn areas during the period of maintenance to a height of 2 inches whenever the height of the grass becomes 3 inches. A minimum of 3 mowings is required during the period of maintenance.
 2. Refertilizing
 - a. Distribute fertilizer on the seeded area between August 15 and October 15, during the period when grass is dry, and in accordance with the manufacturer's recommendations. The fertilizer shall be as specified in the soils test.
 3. Reseeding
 - a. Reseed with the seed specified for the original seeding, at the rate of 4 lbs. per 1,000 S.F. in a manner which will cause minimum disturbance to the existing stand of grass and at an angle of not less than 15 degrees from the direction of rows of prior seeding.
 4. Watering
 - a. The Contractor shall keep all work areas watered daily to achieve satisfactory growth. Water shall be applied at a rate of 120 gallons per 1,000 square feet. If water is listed as a pay item, it shall be separately paid for based on the actual amount of water used, measured in thousands of gallons.
 5. Any mulching which has been displaced shall be repaired immediately. Any seed work which has been disturbed or damaged from the displacement of mulch shall be repaired prior to remulching.

3.6 INSPECTION AND ACCEPTANCE

- A. When seeding work is complete and an acceptable stand of growth is attained, the Contractor shall request the Owner's Representative to make an inspection to determine final acceptance.
- B. Acceptance shall be based upon achieving a vigorous uniformly stand of the specified grasses. If some areas are satisfactory and some are not, acceptance may be made in blocks, provided they are definable or bounded by readily identified permanent surfaces, structures, or other reference means. Partial acceptance decisions may be made by the Owner's Representative. Excessive fragmentation into accepted and unaccepted areas shall not be allowed. Unaccepted areas shall be maintained by the Contractor until acceptable.
- C. No payment shall be made until areas are accepted.
- D. All seeded areas shall be guaranteed for one full growing season to commence upon final acceptance of the areas.

END OF SECTION 329200.19

SECTION 330110.80 – SANITARY SEWER ABANDONMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- B. The following Detailed Specifications are specifically referenced and apply to the work as may be required:
 - 1. Section 333100 – Sanitary Sewer System

1.2 DESCRIPTION OF WORK

- A. This work shall consist of the permanent abandonment of existing pipelines noted on the drawings to be abandoned in place and capped. This includes cutting pipes, plugging ends with concrete, and providing necessary equipment.

1.3 SUBMITTALS

- A. Comply with the requirements of Section 013323 Shop Drawings, Product Data and Samples.

PART 2 - PRODUCTS

2.1 CONCRETE

- A. Concrete for end plugs, Class C.
- B. Grout
 - 1. ODOT Item 613, Type 2 Low Strength Mortar (LSM), flowable fill.
 - 2. Unconfined compressive strength: minimum 75 psi and maximum 150 psi at 56 days, as determined based on an average of three tests for same placement. Present at least three acceptable strength tests for proposed mix design in mix design report.
 - 3. Placement characteristics: self-leveling.
 - 4. Shrinkage characteristics: non-shrink.
 - 5. Water bleeding for fill to be placed by grouting method in pipes: not to exceed 2 percent according to ASTM C940.
 - 6. Minimum wet density: 90 pounds per cubic foot.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Do not begin cut, plug and abandonment operations until replacement sewers have been constructed, disinfected, and tested and services have been transferred to replacement sewer.
- B. Notify Inspector at least 24-hours in advance of filling with flowable fill.
- C. Select fill placement equipment and follow procedures with sufficient safety and care to avoid damage to existing underground utilities and structures. Operate equipment at pressure that will not distort or imperil portions of the work, new or existing.
- D. Cut and cap portions of the piping system to remain, as shown on the Drawings.
- E. Drain sewer to be abandoned as necessary.
- F. Perform demolition work. Remove and dispose of debris in accordance with applicable codes and regulations.
- G. Plug or cap ends or openings in abandoned sewer with concrete plug bulkheads.
- H. Remove and dispose of surface identifications such as valve boxes as required for this project.

3.2 PROTECTION OF PERSONS AND PROPERTY

- A. Provide safe working conditions for employees throughout demolition and removal operations. Observe safety requirements for work below grade.
- B. Maintain safe access to adjacent property and buildings. Do not obstruct roadways, sidewalks or passageways adjacent to the Work.

END OF SECTION 330110.80

SECTION 330130.01- SEWER COLLECTION SYSTEM REHABILITATION DEFINITIONS

PART 1 - GENERAL

1.1. RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 Specifications, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. The work covered by this project shall include the furnishing of all labor, equipment, materials, and supervision; and performing all work necessary to investigate, rehabilitate, and/or replace the designated sewer lines, manholes, etc., all in accordance with the specifications. The work shall consist of, but not necessarily be limited to, performing the following work tasks where specified:
 - 1. Sewer Line Cleaning
 - 2. Sewer Flow Control
 - 3. Television Inspection
 - 4. Sewer Pipe Joint Testing
 - 5. Sewer Pipe Joint Sealing
 - 6. Sewer Manhole Rehabilitation
 - 7. Sewer Manhole Replacement
 - 8. Sewer Manhole Separation
 - 9. Sliplining of Sewers
 - 10. Cured-in-Place Pipe Installation
 - 11. Sewer Point Repairs
 - 12. Service Lateral Sealing and Televising
- B. The area of work and the type of repair/rehabilitation to be performed shall be at those locations shown on the tables or drawings in the Specific Project Requirements section of these specifications.

1.3 DEFINITIONS

- A. Wherever used in these specifications, the following words and terms shall have the meanings indicated:
 - 1. AREAWAY: A paved surface, serving as an entry area to a basement or subsurface portion of a building, which is provided with some form of drainage device that may be connected to a sewer line.
 - 2. AVAILABLE WATER: Water necessary for the performance of work, which may be taken only from fire hydrant(s) approved by the Owner, given conditions of traffic and terrain which are compatible with the use of the hydrant for performance of work.
 - 3. BUILDING SEWER: The conduit which connects building wastewater sources to the public or street sewer (referred to also as "house sewer," "building connection,"

"lateral," or "service connection"), including lines serving homes, public buildings, commercial establishments, and industry structures. In this specification, the building sewer is referred to in two sections:

- a. The section between the building and the property line, right-of-way line, or to a point specified and supervised by the Owner's designated representative.
 - b. The remaining section to the collector sewer, including the connection thereto.
4. BYPASS: An arrangement of pipes, conduits, gates, and valves whereby the flow may be passed around a hydraulic structure or appurtenance. Also, a temporary setup to route flow around a specified part of a sewer system.
5. BYPASS PUMPING: The transportation of sewage flows around a specific sewer pipe line section or sections via any conduit for the purpose of controlling sewage flows in the specified section or sections without flowing or spilling onto public or private property.
6. CELLAR DRAIN: A pipe or series of pipes which collect wastewater which leak, seep, or flow into subgrade parts of structures and discharge them into a building sewer, or by other means dispose of such wastewater into sanitary, combined or storm sewers.
 - a. Referred to also as a "basement drain."
7. CHANGE ORDER: A written order to the Contractor authorizing an addition, deletion, or revision in the work within the general scope of work of the agreement or authorizing an adjustment in the agreement price or agreement time.
8. COLLECTOR SEWER: A sewer located in the public way which collects the wastewater discharged through building sewers and conducts such flows into larger interceptor sewers and pumping and treatment works.
 - a. Referred to also as "street sewer."
9. COMBINED SEWER: A sewer intended to serve as both a sanitary sewer and a storm sewer, or as both an industrial sewer and a storm sewer.
10. COMPRESSION GASKET: A device which can be made of several materials in a variety of cross sections, and which serves to secure a tight seal between two pipe sections (e.g., "O"-rings).
11. CORBEL OR CONE: That portion of a manhole structure which slopes upward and inward from the barrel of the manhole to the manhole cover frame.
12. CREW: The number of persons required for the performance of work at a site as determined by the Contractor in response to task difficulty and safety considerations at the time or location of the work
13. DEBRIS: Soil, rocks, sand, grease, roots, etc., in a sewer line excluding items mechanically attached to the line such as protruding service connections, protruding pipe, joint materials, and the like.
14. EASEMENT: A liberty, privilege, or advantage without profit which the owner of one parcel of land may have in the land of another. In this agreement, all land, other than public streets, in which the Owner has sewer system lines or installations and right of access to such lines or installations.

15. EASEMENT ACCESS: Areas within an easement to which access is required for performance of work.
16. ENGINEER: The engineer (a person, joint venture, firm, or corporation) who works for or under a contract or subagreement with the Owner and is designated by the Owner as the Engineer of Record under the prime contract.
17. EXFILTRATION: The leakage or discharge of flows being carried by sewers out into the ground through leaks in pipes, joints, manholes, or other sewer system structures; the reverse of "infiltration".
18. EXISTING LINEAR FEET: The total length of existing sewer pipe in place within designated sewer systems as measured from center of manhole to center of manhole from maps or in the field.
19. FLOW CONTROL: A method whereby normal sewer flows or a portion of normal sewer flows are blocked, retarded, or diverted (bypassed) within certain areas of the sewer collection system.
20. FOUNDATION DRAIN: A pipe or series of pipes which collect groundwater from the foundation or footer of structures and discharge it into sanitary, storm, or combined sewers, or to other points of disposal for the purpose of draining unwanted waters away from such structures.
21. GROUTING: The joining together of loose particles of soil in such a manner that the soil so grouped becomes a solid mass which is impervious to water (see also SEWER PIPE JOINT SEALING).
22. HYDRAULIC CLEANING: Techniques and methods used to clean sewer lines with water, e.g.; water pumped in the form of a high-velocity spray and water flowing by gravity or head pressure. Devices include high-velocity jet cleaners, collapsible dams, etc.
23. INFILTRATION: The water entering a sewer system, including building sewers, from the ground, through such means as, but not limited to, defective pipes, pipe joints, connections, or manhole walls. Infiltration does not include, and is distinguished from, inflow.
24. INFILTRATION/INFLOW (I/I): A combination of infiltration and inflow wastewater volumes in sewer lines, with no way to distinguish either of the basic sources, and with the same effect of usurping the capacities of sewer systems and other sewer system facilities.
25. INFLOW: The water discharged into a sewer system, including service connections, from such sources as, but not limited to, roof leaders; cellar, yard, and area drains; foundation drains; cooling water discharges; drains from springs and swampy areas; manhole covers; cross connections from storm sewers, combined sewers, catch basins; storm waters; surface runoff; street wash water; or drainage. Inflow does not include, and is distinguished from, infiltration.
26. INSPECTOR: The Owner's on-site representative responsible for observation and recording of quantities of work performed as set forth in these specifications.
27. INTERCEPTOR SEWER: A sewer which receives the flow from collector sewers and conveys the wastewater to treatment facilities.
28. INTERNAL PIPE INSPECTION: The television inspection of a preselected sewer line section. A television camera is moved through the line at a slow, uniform rate and a continuous picture is transmitted to an aboveground monitor.
29. INVERT: The floor, bottom or lowest point of a conduit.

30. **INVERT LEVEL (ELEVATION):** The level (elevation) of the lowest portion of a liquid - carrying conduit, such as a sewer, which determines in part the hydraulic gradient available for moving the contained liquid
31. **JOINTS:** The means of connecting sectional lengths of sewer pipe into a continuous sewer line using various types of jointing materials. The number of joints depends on the lengths of the pipe sections used in the specific sewer construction work.
32. **LINEAR FOOT:** Being one foot as measured along the centerline of a sewer line.
33. **LONG-TERM MODULUS OF ELASTICITY:** The modulus of elasticity of the material after 50 years of service. This value may be extrapolated from a 10,000 hour test of the material.
34. **MAJOR BLOCKAGE:** A structural defect, collapse, or blockage which prohibits manhole-to-manhole cleaning with commercially available hydraulic or mechanical cleaning equipment.
35. **MANHOLE SECTION:** The length of sewer pipe connecting two manholes.
36. **MECHANICAL CLEANING:** Techniques and methods used to clean sewer lines of debris mechanically with devices such as power rodding machines, winch-pulled brushes, bucket machines, etc.
37. **OVERFLOW:**
 - a. The excess water that overflows the ordinary limits such as the stream banks, the spillway crest, or the ordinary level of a container.
 - b. To cover or inundate with water or other fluid.
38. **PHYSICAL PIPE INSPECTION:** The crawling or walking through manually accessible pipe lines. The logs for this inspection technique record the information of the kind detailed under Internal Pipe Inspection. This inspection technique is only undertaken when field conditions offer minimal hazard or jeopardy to personnel.
39. **PIPE JOINT SEALING:** A method of correcting leaking or defective pipe joints which permit infiltration of extraneous water into the sewers by means of applying chemical materials into and/or through the joint area from within the pipe.
40. **REGULATOR:** A device or apparatus for controlling the quantity of admixtures of sewage and storm water admitted from a combined sewer collector line into an interceptor sewer, or pumping or treatment facilities, thereby determining the amount and quality of the flows discharged through an overflow device to receiving waters or other points of disposal.
41. **ROOF LEADER:** A drain or pipe that conducts storm water from the roof of a structure downward and thence into a sewer for removal from the property, or onto the ground for runoff or seepage disposal.
42. **SANITARY SEWER:** A sewer intended to carry only sanitary or sanitary and industrial wastewater from residences, commercial buildings, industrial parks, and institutions.
43. **SERVICE CONNECTION:** See Building Sewer.
44. **SEWER CLEANING:** The utilization of hydraulic or mechanical techniques and/or devices to dislodge, transport, and remove debris from sewer lines.
45. **SEWER PIPE:** A length of conduit, manufactured from various materials and in various lengths, that when joined together can be used to transport wastewater from point of origin to a treatment works. Materials include, but are not limited to: Acrylonitrile-butadiene-styrene (ABS); Asbestos-Cement (AC); Brick Pipe (BP); Concrete Pipe (CP); Cast Iron Pipe (CIP); Ductile Iron Pipe (DIP); Polyethylene (PE); Polyvinylchloride (PVC); Reinforced Concrete Pipe (RCP); Reinforced Plastic Mortar (RPM); Steel Pipe (SP); Vitrified Clay Pipe (VCP).

46. SITE: Any location where work has been or will be done.
47. SITE ACCESS: An adequately clear area of a size sufficient to accommodate personnel and equipment required at the location where work is to be performed, including roadway or surface sufficiently unobstructed to permit conveyance of vehicles from the nearest paved roadway to the work location.
48. SPRING LINE: The horizontal midpoint of a sewer pipe.
49. STORM SEWER: A sewer intended to carry only storm waters, surface runoffs, street wash water, and drainage.
50. STREET ACCESS: Areas normally used for public vehicular traffic (including roads, streets, or areas within existing rights-of-way or easements) to which safe access is required for performance of work.
51. SUBCONTRACTOR: An individual, firm, or corporation having a direct contract with the Contractor for performance of part of the work.
52. SURCHARGE: When the sewer flow exceeds the hydraulic carrying capacity of the sewer line.
53. SURCHARGE CONDITION: When the sewer flow depth equals or exceeds the diameter of the discharging sewer line or lines.
54. SWALE (DIP, SAG): A significant deviation in pipe grade such as to cause entrapment of solids, semisolids, and liquids, thereby impeding the accuracy and/or effectiveness of flow measurements, cleaning, and internal inspection.

END OF SECTION 330130.01

SECTION 330130.02 - SEWER LINE CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 Specifications, apply to work of this section.
- B. Other Sections Referenced:
 - 1. Section 330130.01 - Sewer Collection System Rehabilitation Definitions

1.2 DESCRIPTION OF WORK

- A. The intent of sewer line cleaning is to remove foreign materials from the lines and restore the sewer to a minimum of 95% of the original carrying capacity or as required for proper lining of the pipe or seating of internal pipe joint sealing packers. Since the success of the other phases of work depends a great deal on the cleanliness of the lines, the importance of this phase of the operation is emphasized. It is recognized that there are some conditions such as broken pipe and major blockages that prevent cleaning from being accomplished or where additional damage would result if cleaning were attempted or continued. If in the course of normal cleaning operations, damage does result from pre-existing and unforeseen conditions such as broken pipe, the Contractor will not be held responsible.

1.3 QUALITY ASSURANCE

- A. In addition to the requirements of these specifications, comply with manufacturer's instructions and recommendations for work.

1.4 SUBMITTALS

- A. Equipment Data: Submit a listing of equipment to be used on the project. Provide equipment operating instructions if requested by the Owner.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All equipment and material shall be of a type that has been in general use for a period of five (5) years. Work performed with experimental equipment or material will not be permitted without prior written consent of the Owner.

2.2 CLEANING EQUIPMENT

- A. **Hydraulically Propelled Equipment:** The equipment used shall be of a movable dam type and be constructed in such a way that a portion of the dam may be collapsed at any time during the cleaning operation to protect against flooding of the sewer. The movable dam shall be equal in diameter to the pipe being cleaned and shall provide a flexible scraper around the outer periphery to insure removal of grease. If sewer cleaning balls or other equipment which cannot be collapsed is used, special precautions to prevent flooding of the sewers and public or private property shall be taken.
- B. **High-Velocity Jet (Hydrocleaning) Equipment:** All high-velocity sewer cleaning equipment shall be constructed for ease and safety of operation. The equipment shall have a selection of two or more high-velocity nozzles. The nozzles shall be capable of producing a scouring action from 15 to 45 degrees in all size lines designated to be cleaned. Equipment shall also include a high-velocity gun for washing and scouring manhole walls and floor. The gun shall be capable of producing flows from a fine spray to a solid stream. The equipment shall carry its own water tank, auxiliary engines, pumps and hydraulically driven hose reel.
- C. **Mechanically Powered Equipment:** Bucket machines shall be in pairs with sufficient power to perform the work in an efficient manner. Machines shall be belt operated or have an overload device. Machines with direct drive that could cause damage to the pipe will not be allowed. A power rodding machine shall be either a sectional or continuous rod type capable of holding a minimum of 750 feet of rod. The rod shall be specifically heat-treated steel. To insure safe operation, the machine shall be fully enclosed and have an automatic safety clutch or relief valve.

PART 3 - EXECUTION

3.1 CLEANING PRECAUTIONS

- A. During sewer cleaning operations, satisfactory precautions shall be taken in the use of cleaning equipment. When hydraulically propelled cleaning tools (which depend upon water pressure to provide their cleaning force) or tools which retard the flow in the sewer line are used, precautions shall be taken to ensure that the water pressure created does not damage or cause flooding of public or private property being served by the sewer.
- B. When possible, the flow of sewage in the sewer shall be utilized to provide the necessary pressure for hydraulic cleaning devices. When additional water from fire hydrants is necessary to avoid delay in normal work procedures, the water shall be conserved and not used unnecessarily.
- C. No fire hydrant shall be obstructed in case of a fire in the area served by the hydrant.

3.2 SEWER CLEANING

- A. The designated sewer manhole sections shall be cleaned using hydraulically propelled, high-velocity jet, or mechanically powered equipment. Selection of the equipment used shall be based on the conditions of lines at the time the work commences. The equipment and methods selected shall be satisfactory to the Engineer. The equipment shall be capable of removing dirt, grease, rocks, sand, and other materials and obstructions from the sewer lines and manholes.
- B. If cleaning of an entire section cannot be successfully performed from one manhole, the equipment shall be set up on the other manhole and cleaning again attempted. If, again, successful cleaning cannot be performed or the equipment fails to traverse the entire manhole section, it will be assumed that a major blockage may exist, the cleaning effort shall be suspended, and the Engineer shall be notified.

3.3 ROOT REMOVAL

- A. Roots shall be removed in the manhole sections where root intrusion occurs. Special attention should be used during the cleaning operation to assure complete removal of roots from the joints. Any roots which could prevent proper lining of the pipe, prevent the seating of a pipe joint packer, or prevent the proper application of chemical sealants shall be removed.
- B. Mechanical procedures may include the use of equipment such as rodding machines, bucket machines and winches using root cutters and porcupines, and equipment such as high-velocity jet cleaners.
- C. All roots must be removed prior to grouting or lining. If roots are detected during either of grouting or lining, the Contractor shall remove his equipment and reclean the line to ensure root removal. This work shall be performed at no additional cost to the Owner if the manhole section was previously cleaned as a pay item.

3.4 MATERIAL REMOVED

- A. All sludge, dirt, sand, rocks, grease, and other solid or semisolid material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned.
- B. Passing material from manhole section to manhole section, which could cause line stoppages, accumulations of sand in wet wells, or damage pumping equipment, shall not be permitted.
- C. When necessary or when directed by the Engineer, an approved dam or weir shall be constructed in the downstream manhole in such a manner that solids and debris will be trapped and retained. The cost of such a dam or weir shall be included in the cost of cleaning.

3.5 DISPOSAL of MATERIALS

- A. All solids or semisolids resulting from the cleaning operations shall be removed from the site and disposed of at a location approved by the Owner.
- B. Trucks hauling solids or semisolids from the site shall be watertight so that no leakage or spillage will occur.
- C. All materials shall be removed from the site no less often than at the end of each workday.
- D. Under no circumstances will the Contractor be allowed to accumulate debris, etc., on the site of work beyond the stated time, except in totally enclosed containers and as approved by the Owner.

3.6 FINAL ACCEPTANCE

- A. Acceptance of sewer line cleaning shall be made upon the successful completion of the television inspection and shall be to the satisfaction of the Owner.
- B. If CCTV inspection shows the cleaning to be unsatisfactory, the Contractor shall be required to reclean and reinspect the sewer line at no additional expense to the City.
- C. In areas where television inspection is not performed, the Engineer may require the Contractor to pull a double squeegee (with each squeegee the same diameter as the sewer) through each manhole section as evidence of adequate cleaning.

END OF SECTION 330130.02

SECTION 330130.03 - SEWER FLOW CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 Specifications, apply to work of this Section.
- B. Other Sections Referenced:
 - 1. Section 330130.01 - Sewer Collection System Rehabilitation Definitions

1.2 DESCRIPTION OF WORK

- A. The intent of this work is to control the flow in the sewer to enable the successful inspection, rehabilitation or replacement of the pipe.
- B. Depth of flow shall not exceed that shown below for the respective pipe sizes when performing television inspection, joint testing and/or sealing.

Pipe Diameter Maximum Depth of Flow

1.	6" - 10" Pipe	-	25% of pipe diameter
2.	12" - 24" Pipe	-	33% of pipe diameter
3.	27" & up Pipe	-	40% of pipe diameter

- C. Flow shall be controlled or bypassed from sewer sections being lined or replaced. The methods used shall be in accordance with the work being performed.

1.3 QUALITY ASSURANCE

- A. When flow in a sewer line is plugged, blocked, or bypassed; sufficient precautions must be taken to protect the sewer lines from damage that might result from sewer surcharging. Further, precautions must be taken to ensure that sewer flow control operations do not cause flooding or damage to public or private property being served by the sewers involved.

1.4 SUBMITTALS

- A. The Contractor shall submit a written request for Sewer Flow Control, specify the method and equipment to be used, and receive approval from the Owner prior to performing the work.
- B. For bypass pumping, submit shop drawings in accordance with the General Requirements showing pumps, piping layout plan and dimensions, schedule of pipe fittings and specials, materials and class for each size and type of pipe, joint details, and any special provisions required for assembly. Provide a wet weather operation plan which describes what procedures will be followed when flow exceeds pumping capacity.

PART 2 - PRODUCTS

2.1 EQUIPMENT

- A. Sewer plugs shall be so designed that all or any portion of the sewage can be quickly released.
- B. Pumping and bypassing:
 - 1. Pumps bypass pipe, fittings, and joining methods shall be suitable and of a type normally used for raw sanitary sewage.
 - 2. The bypass system shall be of sufficient capacity to handle existing peak dry weather flow plus additional flow that may occur during a rainstorm unless otherwise provided for by an approved wet weather operation plan.
 - 3. If pumping is required on a 24-hour basis, engines shall be equipped in a manner to keep noise to a minimum.
 - 4. Bypass piping to be furnished and installed shall include, but not limited to all pipe, fittings, specials, bends, beveled pipe, adapters, bulkheads, stoppers, plugs, joint restraints, joints and jointing materials, and pipe supports. Bypass piping shall be rated to twice the system operating pressure.
- C. Hydrocleaning equipment shall be equipped with high-velocity nozzles capable of pulling flow away from the pipe section being televised. The equipment shall carry its own water tank, auxiliary engines, pumps and hydraulically driven hose reel.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. The Contractor shall continuously supervise the level of water in the upstream and downstream sewers to ensure that harmful surcharging does not occur. The Contractor shall be responsible for any damage to the system and/or to public or private property resulting from improper execution of flow control measures.

3.2 PLUGGING OR BLOCKING

- A. A sewer line plug shall be inserted into the line upstream of the section being worked. During TV inspection, testing and sealing operations, flow shall be reduced to within the limits specified above. After the work has been completed, flow shall be restored to normal.

3.3 PUMPING AND BYPASSING

- A. When pumping and bypassing is required, the Contractor shall supply and install the pumps, conduits, and other equipment to divert the flow around the section in which work is to be performed. Under no circumstances will the discharge of raw sewage to other than sanitary sewers be allowed.

- B. The Contractor shall be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and bypassing system.
- C. The proposed bypassing system shall be set up to allow traffic flow to local residents and businesses.
- D. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- E. Make connections to all existing force mains being bypassed.
- F. Install temporary bypass piping with restrained joints at horizontal and vertical changes in direction.
- G. Provide granular material for bedding and encasement of temporary piping when buried below pavement.
- H. Field test bypass piping and obtain approval from the Engineer prior to placing bypass system in service.
- I. Installation of bypass pumping facilities and the subsequent operation shall not commence until the Contractor has all materials and equipment available to perform the necessary sewer related improvements.
- J. mmence until the Contractor has all materials and equipment available to perform the necessary sewer related improvements.
- K. Do not remove pumping and bypass system until it is no longer needed and can be replaced by authorized use of completed permanent facilities.

3.4 HYDRAULIC FLOW CONTROL

- A. This method shall be used for sewer televising only. The Contractor shall position the high-velocity nozzle no less than five (5) feet ahead of the television camera. Pressures shall be just sufficient to reduce the flow level in front of the camera to the specified depth. The jet nozzle shall be reeled in at the same rate as the forward movement of the television camera to maintain the separation distance.

END OF SECTION 330130.03

SECTION 330130.17 - TELEVISION INSPECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 Specifications, apply to work of this section.
- B. Other Sections Referenced:
 - 1. Section 330130.01 – Sewer Collection System Rehabilitation Definitions
 - 2. Section 330130.02 – Sewer Line Cleaning
 - 3. Section 330130.03 – Sewer Flow Control
 - 4. Section 330130.72 – Cured in Place Pipe Lining
 - 5. Section 330130.74 – Cured in Place Lateral Lining

1.2 DESCRIPTION OF WORK

- A. After cleaning or when otherwise specified, the manhole sections shall be visually inspected by means of closed-circuit television (CCTV). The inspection will be done one manhole section at a time and the flow in the section being inspected will be suitably controlled.

1.3 QUALITY ASSURANCE

- A. In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work. CCTV shall be performed by NASSCO PACP certified personnel.

1.4 SUBMITTALS

- A. Equipment Data: Submit equipment manufacturer's technical data and operation instructions for the televising and recording equipment to be used.
- B. Product Data: Submit brand name and specifications of video tape to be used for the recording of the televising data.
- C. Report: Submit sample televising log report for review and approval of content and format.

PART 2 - PRODUCTS

2.1 GENERAL

- A. The camera, television monitor, and other components of the video system shall be capable of producing picture quality to the satisfaction of the Owner's Representative, and if

unsatisfactory, equipment shall be removed, and no payment will be made for an unsatisfactory inspection.

2.2 MATERIAL

- A. Video recording shall be submitted on a USB flash drive.

2.3 EQUIPMENT

- A. The television camera used for the inspection shall be one specifically designed and constructed for such closed-circuit sewer pipe inspection. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions. The camera shall televise and transmit the image in color and shall have pan and tilt capabilities.
- B. The propulsion system shall be either a tractor, skid and winch arrangement, or with special approval from the Owner, a float.
- C. The recording system shall be digital with capability for annotating and narrating the video image, and for producing digital photographs of the television picture.

PART 3 - EXECUTION

3.1 PROCEDURE

- A. Normally, the camera will be set up in the upstream manhole. Where the setup causes the camera lens to be positioned a distance upstream or downstream of the manhole wall, the operator shall make a visual observation of that portion of the sewer pipe not captured on the video tape and record the observations by voice over on the video tape.
- B. The height of the camera shall be adjusted so that the lens is at the center of the pipe.
- C. The camera will be moved through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of the sewer's condition. In no case will the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line.
- D. The camera will be moved to the far manhole and the recording shall show the condition of the manhole trough. The operator shall make a visual observation of the far manhole. Connecting pipes and manhole defects not captured on the video shall be recorded by voice over on the video tape and written in the television inspection log.
- E. Connections to the sewer shall be televised using the pan and tilt capabilities of the camera. The camera shall be positioned in the sewer at a location which maximizes the sight distance up the connecting pipe. The acceptable length of televising shall be a distance of 6 feet, or to the end of the pipe (if capped), or to the first bend (if a wye).

- F. If, during the inspection operation, the television camera will not pass through the entire manhole section, the Contractor shall perform a reverse setup (set up their equipment so that the inspection can be performed from the opposite manhole). If, again, the camera fails to pass through the entire manhole section, the manhole section will be referred to the Engineer for evaluation.
- G. When manually operated, winches are used to pull the television camera through the line, telephones or other suitable means of communication shall be set up between the two manholes of the section being inspected to insure good communications between members of the crew.
- H. The importance of accurate distance measurements is emphasized. Measurement for location of defects and connections shall be by means of a footage counter with the value displayed on the video tape. The footage counter shall be set such that zero is the center of the beginning manhole. Marking on the cable, or the like, which would require interpolation for depth of manhole, will not be allowed. Accuracy of the footage counter shall be checked above ground by use of a walking meter, roll-a-tape, or other suitable device. The footage counter shall be calibrated to an accuracy that is satisfactory to the Engineer.
- I. Documentation of the television results shall be as follows:
 - 1. Television Inspection Logs: Printed location records shall be kept by the Contractor and will clearly show the location in relation to an adjacent manhole of each infiltration point observed during inspection. In addition, other points of significance such as locations of building sewers, unusual conditions, roots, storm sewer connections, broken pipe, presence of scale and corrosion, and other discernible features will be recorded, and a copy of such records will be supplied to the Owner. Each feature called out on the inspection log shall be identified as to its location on the videotape by means of a footage counter. When more than one manhole section is recorded on a video tape, the television inspection log shall record the elapsed tape time from the beginning of the tape to the beginning of the manhole section.
 - 2. Photographs: Digital photographs of the television picture of problems shall be taken by the Contractor upon request of the Engineer, as long as such photographing does not interfere with the Contractor's operations.
 - 3. Videotape Recordings: The purpose of tape recording shall be to supply a visual and audio record of problem areas of the lines that may be replayed. Videotape recording playback shall be at the same speed that it was recorded. Slow motion or stop-motion playback features may be supplied at the option of the Contractor. Title to the tape shall be given to the Owner upon completion of the project. The Contractor shall have all videotapes and necessary playback equipment readily accessible for review by the Owner during the project.

END OF SECTION 330130.17

SECTION 330130.72 - CURED-IN-PLACE PIPE LINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- B. Other Sections Referenced:
 - 1. Section 330130.01 - Sewer Collection System Rehabilitation Definitions
 - 2. Section 330130.02 - Sewer Line Cleaning
 - 3. Section 330130.03 - Sewer Flow Control
 - 4. Section 330130.17 - Television Inspection
- C. Other documents which shall be considered part of and included in these specifications.
 - 1. ASTM - F1216 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube
 - 2. ASTM - F1743 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pull in and Inflate and Curing of a Resin-Impregnated Tube
 - 3. ASTM - D543 Standard and Practice for Evaluating the Resistance of Plastics to Chemical Reagents
 - 4. ASTM - D638 Standard Test Method for Tensile Properties of Plastics
 - 5. ASTM - D790 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
 - 6. ASTM - D792 Standard Test Methods for Density and Specific Gravity of Plastics by Displacement.
 - 7. ASTM - F2019 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP)
 - 8. ASTM - D2122 Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings
 - 9. ASTM F2561 Standard Practice for Rehabilitation of a Sewer Service Lateral and Its Connection to the Main Using a One-Piece Main and Lateral Cured-in-Place Liner
 - 10. ASTM - D2990 Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics
 - 11. ASTM - D3567 Standard Practice for Determining Dimensions of Fiberglass (Glass-Fiber-Reinforced Thermosetting Resin) Pipe and Fittings
 - 12. ASTM - D3681 Standard Test Method for Chemical Resistance of "Fiberglass (Glass Fiber Reinforced Thermosetting Resin) Pipe in a Deflected Condition
 - 13. ASTM - D5813 Standard Specification for Cured-in Place Thermosetting Resin Sewer Pipe
 - 14. ASTM E 132 Test Method for Poisson's Ratio at Room Temperature

- D. Neither the CIPP product, system, nor its installation, shall cause adverse effects to any of the Owner's processes or facilities. The installation pressure for the product shall not damage the system in any way, and the use of the product shall not result in the formation or production of any detrimental compounds or by-products at the wastewater treatment plant or to local receiving waters. The Contractor shall notify the Owner and identify any by-products produced as a result of the installation operations, test and monitor the levels, and comply with any and all local waste discharge requirements. The Contractor shall clean up, restore existing surface conditions and structures, and repair any of the CIPP system determined to be defective. The Contractor shall conduct installation operations and schedule cleanup in a manner to cause the least possible obstruction and inconvenience to traffic, pedestrians, businesses and property owners or tenants.
- E. The prices submitted by the Contractor, shall include all costs of permits, labor, equipment and materials for the various bid items necessary for furnishing and installing, complete in place, CIPP in accordance with these specifications. All items of work not specifically mentioned herein which are required, by the contractor, to make the product perform as intended and deliver the final product as specified herein shall be included in the respective lump sum and unit prices bid.

1.2 DESCRIPTION OF WORK

- A. The Contractor shall provide all materials, labor, equipment, and services necessary for traffic control, bypass pumping and/or diversion of flows (unless specifically included as a bid item), cleaning and television inspection of sewers to be rehabilitated, liner installation, reconnection of service connections, all quality controls, provide samples for performance of required material tests, final television inspection, testing of the rehabilitated pipe system, warranty work and other work, all as specified herein.
- B. The CIPP shall be continuous and jointless from manhole to manhole or access point to access point and shall be free of all defects that will affect the long-term life and operation of the pipe.
- C. The CIPP shall fit sufficiently tight within the existing pipe so as to not leak at the manholes, at the service connections, or through the wall of the installed pipe. If leakage occurs at the manholes or the service connections, the Contractor shall seal these areas to stop all leakage using a material compatible with the CIPP. If leakage occurs through the wall of the pipe, the CIPP shall be repaired, or removed and replaced, as recommended by the CIPP manufacturer. Final approval of the CIPP will be based on a leak tight pipe.
- D. The CIPP shall be designed for a life of 50 years or greater and an equal service life unless specifically specified otherwise by the Owner.
- E. The installed CIPP shall withstand all applicable surcharge loads (soil overburden, live loads, etc.) and external hydrostatic (groundwater) pressure, if present, for each specific installation location.
- F. The installed CIPP shall have a long term (50 year or greater) corrosion resistance to the typical chemicals found in domestic sewage and defined in the referenced and applicable ASTM standards.

- G. The intent of cured-in-place pipe (CIPP) is to rehabilitate sewer lines by installing a flexible polyester felt tube saturated with a thermosetting resin into the existing pipe. When cured and complete, the installed pipe should extend the full length of the pipe section being rehabilitated and shall provide a structurally sound, continuous, jointless, tight-fitting, watertight pipe within a pipe. The Contractor is responsible for proper, accurate and complete installation of the CIPP using the system selected by the Contractor meeting the Owners requirements. Deficiencies which will be corrected by the finished product include:
1. Cracked and broken pipe caused by poor construction, unstable soil, earth movement, infiltration, roots, destructive loadings, cleaning tool damage, etc.
 2. Corrosion of pipe caused by acid attack above the flow line.
 3. Erosion of pipe caused by abrasion below the flow level.
 4. Degradation of brick pipe caused by loss of masonry.
 5. Infiltration of groundwater and soil through leaking pipe joints and structural defects.
 6. Exfiltration of transported fluid through leaking pipe joints and structural defects.
 7. Inflow of surface water and infiltration of groundwater through unused or illegal connections.

1.3 QUALITY ASSURANCE

- A. In addition to the requirements of these specifications, comply with manufacturer's instructions and recommendations for work.
- B. Installer's Qualifications: Firms with at least 5 successfully completed projects having installed an aggregate total of 10,000 linear feet of the submitted manufacturer's cured-in-place liner.

1.4 SUBMITTALS

- A. Submit the latest edition and any revisions thereto of the manufacturer's technical data and installation instructions including fabric tube, flexible membrane (coating material), raw resin data, shipping/ storage/ handling instructions, tube wet-out & cure methods, and CIPP manufacturer's repair/replacement procedures.
- B. Submit Material Safety Data Sheet(s) for the resins, any other chemical additives, and any other chemicals used in the CIPP system.
- C. Submit certified copies of all test reports on the properties of the proposed resin materials prior to their use. Tests shall be performed by an approved independent testing laboratory or other approved source.
- D. If not submitting the specified CIPP thickness, submit approvable design calculations for the CIPP material thickness for each section of the pipe to be rehabilitated.

1.5 SAFETY

- A. The Contractor shall conform to all work safety requirements of pertinent regulatory agencies and shall secure the site for the working conditions in compliance with the same. The Contractor shall erect such signs and other devices as are necessary for the safety of the work site.

- B. The Contractor shall perform all of the work in accordance with applicable OSHA standards. Emphasis shall be placed upon the requirements for entering confined spaces and with the equipment being utilized for pipe renewal.
- C. The Contractor shall submit a proposed Safety Plan to the Owner, prior to beginning any work, identifying all competent persons. The plan shall include a description of a daily safety program for the job site and all emergency procedures to be implemented in the event of a safety incident. All work shall be conducted in accordance with the Contractor's submitted Safety Plan.
 - 1. Safety plan shall include a notification of work flyer that will be distributed to all properties connected to the sewer that will be worked on. Notification shall include details of work, dates for expected installation of CIPP, and best measures for preventing fumes from CIPP curing from entering through connected laterals.
- D. Compensation for all work required for the submittal of the Safety Plan shall be included in the various pipelining items contained in the Proposal.

1.6 AS-BUILT DRAWINGS/RECORDS

- A. As-Built drawings/records, pre & post inspection videotapes, CDs or other electronic media shall be submitted to the Owner, by the Contractor, within 2 weeks of final acceptance of said work or as specified by the Owner. As-Built drawings/records will include the identification of the work completed by the Contractor and shall be prepared on one set of Contract Drawings/Records provided to the Contractor at the onset of the project.

1.7 WARRANTY

- A. The materials used for the project shall be certified by the manufacturer for the specified purpose. The Contractor shall warrant the CIPP material and installation for a period of one (1) year. During the Contractor warranty period, any defect which may materially affect the integrity, strength, function and/or operation of the pipe, shall be repaired at the Contractor's expense in accordance with procedures as recommended by the manufacturer.
- B. After a pipe section has been rehabilitated and for a period of time up to one (1) year following completion of the project, the Owner may inspect all or portions of the rehabilitated system. The specific locations will be selected at random by the Owner's inspector and should include all sizes of CIPP from this project. If it is found that any of the CIPP has developed abnormalities since the time of "Post Construction Television Inspection," the abnormalities shall be repaired and/or replaced in accordance with plans, specifications, and Owner standards.
- C. On any work completed by the contractor that is defective and/or has been repaired, the contractor shall warrant this work for (1) year in addition to the warranty required by the contract.

1.8 GENERAL

- A. All equipment and material shall be of a type that has generally been in use for a period of five (5) years. Work performed with experimental equipment or material will not be permitted without prior written consent of the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All materials used in the installation of CIPP shall be equal to or exceed the manufacturer's standards.
 - 1. Resin:
 - a. The resin shall be a corrosion resistant polyester or vinyl ester resin and catalyst system or epoxy and hardener system that, when properly cured within the tube composite, meets the requirements of ASTM F1216, ASTM F1743 or F2019 and ASTM D5813, the physical properties herein, and those which are to be utilized in the design of the CIPP for this project. The resin, specified for the specific application defined in the contract documents, shall produce CIPP which will comply with or exceed the structural and chemical resistance requirements of this specification.
 - b. The resin to tube ratio, by volume, shall be furnished as recommended by the manufacturer.
 - 2. Fabric Tube
 - a. The fabric tube shall consist of one or more layers of absorbent non-woven felt fabric, felt/fiberglass, felt/carbon fiber, carbon fiber or fiberglass and meet the requirements of ASTM F 1216, ASTM F 1743, or ASTM F2019 and ASTM D5813. The fabric tube shall be capable of absorbing and carrying resins, constructed to withstand installation pressures and curing temperatures and have sufficient strength to bridge missing pipe segments and stretch to fit irregular pipe sections. The contractor shall submit certified information from the felt manufacturer on the nominal void volume in the felt fabric that will be filled with resin.
 - b. The wet-out fabric tube shall have a uniform thickness and excess resin distribution that when compressed at installation pressures will meet or exceed the design thickness after cure.
 - c. The fabric tube shall be manufactured to a size and length that when installed will tightly fit the internal circumference, meeting applicable ASTM standards or better, of the original pipe. Allowance shall be made for circumferential stretching during installation. The tube shall be properly sized to the diameter of the existing pipe and the length to be rehabilitated and be able to stretch to fit irregular pipe sections and negotiate bends. The Contractor shall determine the minimum tube length necessary to effectively span the designated run between manholes.
 - d. The Contractor shall verify the lengths in the field prior to ordering and prior to impregnation of the tube with resin to ensure that the tube will have sufficient length to extend the entire length of the run. The Contractor shall

also measure the inside diameter of the existing pipelines in the field prior to ordering liner so that the liner can be installed in a tight-fitted condition.

The outside and/or inside layer of the fabric tube (before inversion/pull-in, as applicable) shall be coated with an impermeable, flexible membrane that will contain the resin and facilitate, if applicable, vacuum impregnation and monitoring of the resin saturation during the resin impregnation (wet-out) procedure.

- e. No material shall be included in the fabric tube that may cause delamination in the cured CIPP. No dry or unsaturated layers shall be acceptable upon visual inspection as evident by color contrast between the tube fabric and the activated resin containing a colorant.
 - f. The wall color of the interior pipe surface of CIPP after installation shall be a light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made. The hue of the color shall be dark enough to distinguish a contrast between the fully resin saturated felt fabric and dry or resin lean areas. Seams in the fabric tube, if applicable, shall meet the requirements of ASTM D5813.
 - g. The outside of the fabric tube shall be marked a maximum of every 5 feet with the name of the manufacturer or CIPP system, manufacturing lot and production footage.
 - h. The minimum length of the fabric tube shall be that deemed necessary by the installer to effectively span the distance from the starting manhole to the terminating manhole or access point, plus that amount required to run-in and run-out for the installation process.
 - i. The nominal fabric tube wall thickness shall be constructed, as a minimum, to the nearest 0.5 mm increment, rounded up from the design thickness for that section of installed CIPP. Wall thickness transitions, in 0.5 mm increments or greater as appropriate, may be fabricated into the fabric tube between installation entrance and exit access points. The quantity of resin used in the impregnation shall be sufficient to fill all of the felt voids for the nominal felt thickness.
- 3. The uncured tubing shall be designed to withstand the insertion stresses, and to be able to negotiate pipe joint offsets, gaps, and angular changes up to and including forty-five degrees (45°).
 - 4. The nominal specified thickness for each pipe section shall be as shown on the plans. The cured material thickness tolerance shall be plus or minus twenty-five percent ($\pm 25\%$) of the specified thickness. The thickness of any inner and/or outer membrane shall not be included.
 - 5. Pre-Liner
 - a. The pre-liner material shall be a three-ply laminate composed of polyethelene that shall act as a retarder against styrene vapors from exiting into lateral connections, through joints, or through other openings in the host pipe during the CIPP resin curing process.
 - b. All pre-liners shall be compatible with approved fabric tubing and resins used for CIPP and shall not reduce any of the cured physical or structural properties specified herein nor shall it have any adverse affect to the CIPP adhesion to host pipe.
 - c. Pre-liners shall be installed per manufacturer's specifications and instructions
 - d. Approved materials: Griffolyn TX-1200 or approved equivalent.

6. Minimum Physical Properties
 - a. Where specific thicknesses are not provided the following values shall be used to calculate a minimum value.
 - 1) All pipe shall be considered fully deteriorated.
 - 2) All pipe shall be subjected to soil loads of 120 pounds per cubic foot.
 - 3) All pipe shall be subject to AASHTO HS-20 highway loading.
 - 4) The water table shall be assumed to be five (5) feet below the ground surface.
 - 5) All pipe shall be assumed to have five percent (5%) ovality.
 - 6) Creep Retention Factor 50%.
 - 7) Constrained Soil Modulus per AASHTO LRFD Section 12 and AWWA Manual M45.
 - 8) Minimum Service Life 50 years.
 - 9) Design Safety Factor of 2.0 (1.5 for pipes 36" or larger)

7. Structural Requirements

- a. The cured pipe material shall conform to the minimum structural standards as listed below. Evidence shall be presented to demonstrate that the long-term modulus of elasticity of the cured product is no less than fifty percent (50%) of the herein specified Modulus of Elasticity (Short-term).

<u>Cured Pipe Material Test</u>	<u>Test Method</u>	<u>Minimum Value</u>
Chemical Resistance	ASTM D 543	< allowed loss
Tensile Strength	ASTM D 638	3,000 psi
Flexural Strength	ASTM D 790	4,500 psi
Flexural Modulus of Elasticity	ASTM D 790	250,000 psi
Poisson's Ratio	ASTM E 132	0.3

- b. The CIPP shall be designed as per ASTM F1216 Appendixes. The CIPP design shall assume no bonding to the original pipe wall.
- c. Any material failing to meet any of the structural standards of this specification may be rejected or may be cause for changing the material thickness if approved by the Engineer.

PART 3 - EXECUTION

3.1 PREPARATORY PROCEDURES

- A. The Contractor shall notify all homeowners on the manhole section to be lined forty-eight (48) hours in advance of the work to be done. The Contractor shall inform the homeowner of precautions necessary to prevent backup of sewage into the house. Notification shall include language that the work may extend beyond normal permitted working hours, if necessary to reinstate service laterals.
- B. The following preparatory procedures shall be adhered to unless otherwise approved by the Engineer:
 1. Cleaning of Sewer Line: Before ordering liner materials for the project, the Contractor shall remove all internal debris from the pipe line that will interfere with the installation and the final product delivery of the CIPP, as required in these specifications, and accurately measure and document the exact size of the existing

pipeline to be rehabilitated. Solid debris and deposits shall be removed from the system and disposed of properly by the Contractor. Moving material from manhole section to manhole section shall not be allowed. As applicable, the contractor shall either plug or install a flow bypass pumping system to properly clean the pipe lines. Precaution shall be taken by the Contractor in the use of cleaning equipment to avoid damage to the existing pipe. The repair of any damage, caused by the cleaning equipment, shall be the responsibility of the Contractor. The Owner will designate a site for the disposal of all debris removed from the Owner's sewer system as a direct result of the cleaning operation. Unless otherwise specified by the Owner, the Contractor shall dispose of all debris at no charge. Should any dumping fees apply, the Contractor shall be compensated at the respective unit price bid in the Proposal for cleaning.

2. **Inspection of Sewer Line:** In accordance with the Television Inspection requirements, the Contractor shall televise the pipe with PACP certified personnel specially trained in locating breaks, obstacles, and service connections. The interior of the sewer line shall be carefully inspected to determine the location and extent of any structural failures. The location of any conditions which may prevent proper installation of the CIPP shall be noted so that such conditions can be corrected. The Contractor shall provide the Owner a copy of the pre-cleaning and post-cleaning video and suitable log, and/or in digital format, for review prior to installation of the CIPP and for later reference by the Owner.
3. **Connections:** While televising the mainline sewer, the Contractor shall accurately measure and record the locations and positions of service connections using a fiberglass or other tape approved by the Engineer. Additionally, the Contractor shall utilize the pan and tilt capabilities of the televising equipment to determine which connections are live (active) and which are not in use. If required by the Contract documents, each connection will be dye tested to determine whether or not the connection is live or abandoned.
4. **Bypassing Sewage:** The Contractor shall provide for the flow of existing mainline and service connection effluent around the section or sections of pipe designated for CIPP installation. With most small diameter pipelines, particularly on terminal sewers, plugging will be adequate but must be monitored on a regular basis to prevent backup of sewage into adjacent homes. Service connection effluent may be plugged only after proper notification to the affected residence and may not remain plugged overnight. Installation of the liner shall not begin until the Contractor has installed the required plugs or a sewage bypass system and all pumping facilities have been installed and tested under full operating conditions including the bypass of mainline and side sewer flows. Once the installation has begun, existing flows shall be maintained, until the resin/tube composite is fully cured, cooled down, fully televised and the CIPP ends finished. The Contractor shall coordinate sewer bypass and flow interruptions with the Owner at least 14 days in advance and with the property owners and businesses at least 1 business day in advance. The pump and bypass lines shall be of adequate capacity and size to handle peak flows. The Contractor shall submit a detail of the bypass plan and design to the Owner before proceeding with any CIPP installation. Compensation for bypass pumping and all associated plans and approvals shall be at the price bid in the Proposal. All bypassing of flow shall be performed as specified under 330130.03 - SEWER FLOW CONTROL.

5. Line Obstructions: It shall be the responsibility of the Contractor to clear the line of obstructions such as solids, dropped joints, protruding service connections, or collapsed pipe that will prevent installation. If the obstruction(s) could have been removed by bucket machines or by using conventional cleaning methods, no compensation will be granted.
 - a. Internal repairs are protruding service connections, dropped portions of pipe which can be removed or pushed back in place, and other obstructions which cannot be cleared using conventional cleaning methods, but which can be cleared from within the pipe. Such internal repairs shall be approved in writing by the Engineer prior to the commencement of the work and shall be considered as a pay item.
 - b. Point repairs are obstructions that cannot be removed by either conventional sewer cleaning equipment or by internal equipment. The Contractor shall make an excavation to expose and remove or repair the obstruction. Such excavation shall be approved in writing by the Engineer prior to the commencement of the work, shall be performed as specified under 18-inch sanitary sewer or field tee connection, and shall be considered as a pay item.
6. Pre-Insertion Television Inspection: The Contractor shall televise and record the sewer pipe immediately before installing CIPP. This televising is to assure that the pipe is clean and existing pipe conditions are acceptable for lining. Should additional cleaning be required, it shall be provided at no additional cost to the Owner. The cost of this televising shall be included in the cost of CIPP.

3.2 INSTALLATION PROCEDURES

- A. General: The Contractor shall designate a location where the uncured resin in original containers and the fiber felt tube will be impregnated prior to installation. The Contractor shall provide for the Owner's inspection of the materials and impregnation procedure. A resin/catalyst system compatible with the requirements of this method shall be used. The quantities of the liquid thermosetting material shall be sufficient to provide the thickness specified herein. When a proprietary lining technique is used and the licensor's procedures for proper installation differ from these specifications, the licensor's procedures shall govern.
- B. Handling: The Contractor shall exercise care during transportation, storage and handling of the liner system to ensure that it will not be torn, cut, or otherwise damaged. The tube shall be impregnated with resin not more than twenty-four (24) hours before the proposed time of installation. Prior to insertion, the tube shall be stored and transported to the site in a refrigerated truck. The insertion shall take place no later than thirty (30) minutes after the catalyst is placed into the resin mix.
- C. Insertion: The impregnated fiber felt tube shall be inserted through an existing manhole, through the pipe to be rehabilitated, to the designated rehabilitation location. The tube shall be inserted in accordance with the manufacturer's instructions.
- D. Temperature: Prior to installation and as recommended by the manufacturer, remote temperature gauges or sensors shall be placed inside the host pipe to monitor the temperatures during the cure cycle. Liner temperature shall be monitored and logged during curing of the liner.

- E. Inflation: The inflation/expansion pressure shall be sufficient to hold it tight to the pipe wall, to produce dimples at side connections and flared ends at manhole walls. Care shall be taken not to over stress the felt tube at the elevated curing temperatures, which may cause damage or failure prior to cure.
- F. Curing: After insertion and inflation/expansion is completed, the Contractor shall supply a suitable heat source. The equipment shall be capable of delivering heat throughout the section to raise the curing medium temperature above the recommended minimum value. This minimum temperature shall be determined by the resin/catalyst system employed. The temperature shall be maintained within the manufacturer's recommended limits for the duration of the cure period. The cure period shall be of a duration recommended by the resin manufacturer, as modified for the installation process.
- G. Cool down: The Contractor shall cool the hardened pipe to a temperature meeting the manufacturer's recommendations. Care shall be taken in the release of the pressure so that a vacuum will not be developed that could damage the newly installed pipe. Temperatures and curing data shall be monitored and recorded by the Contractor, throughout the installation process to ensure that each phase of the process is achieved as approved in accordance with the CIPP System manufacturer's recommendations.
- H. Finish: The installed CIPP shall be continuous over the entire length of a sewer line section and be free from visual defects such as foreign inclusions, dry spots, pinholes, major wrinkles and delamination. The CIPP shall be impervious and free of any leakage through the CIPP wall.
- I. Any defect which will or could affect the structural integrity or strength of the CIPP shall be repaired at the Contractor's expense.
- J. The Contractor shall seal both ends of the CIPP in accordance with the manufacturer's recommendations for the field conditions. If, due to broken or misaligned sewer pipe at manhole walls, the installed pipe fails to make a tight seal, the Contractor shall apply a sealant at that point. The sealant shall be of a resin mixture compatible with that used in the CIPP process. The end shall be sealed for a distance of at least (1) pipe diameter inside the host pipe.
- K. If any of the service connections leak water between the host pipe and the installed CIPP, the connection mainline interface shall be sealed to provide a water tight connection.
- L. Void Areas: Where required by the owner, where necessary in order to assure a structurally sound pipe, or where necessary for the successful CIPP Lining installation, the contractor shall backfill voids that remain after installation of CIPP. The material shall be of the flowable fill type and shall be injected into the void while removing all trapped air from the void. The contractor shall submit the proposed method of placing the flowable fill, including pressures that will not collapse the CIPP and air release method to be employed, to the owner for review before any material is installed. The cost of this work shall be at the unit price bid for flowable fill complete and include all material, equipment and labor to complete the filling of the void.

- M. Testing: After the installation procedures have been performed and curing is complete, but before any service are reinstated, the Contractor shall conduct a leakage test on the sewer line to determine if it is watertight.
1. For water cured liners, the test shall be conducted by using the existing hydrostatic head provided by the standpipe. The test time shall be fifteen (15) minutes, during which time no makeup water shall be added to the standpipe. If at the end of the test period, no significant water loss is observed in the standpipe, the watertightness of the cured-in-place pipe will be considered satisfactory.
 2. For air or steam cured liners, the test shall be conducted by removing the bladder and plugging both ends of the cured pipe. The pipe shall then be pressurized with air to a test pressure of one-half (1/2) psi per vertical foot of pipe depth (not exceeding a test pressure of ten (10) psi). The air flow shall be stopped. If the required pressure can be developed and if the pressure decays by less than one (1) psi within four (4) minutes, the watertightness of the liner pipe will be considered satisfactory.
- N. Service Connection Reinstatement: After testing, the Contractor shall reinstate the existing live service connections. This shall generally be done without excavation, from the interior of the pipe by means of a television camera and a remotely controlled cutting device. The work shall be performed by experienced operators so that no blind holes are made in the CIPP. The openings of the existing live service connections shall be cut to not less than ninety percent (90%) of their original size. The opening shall not be more than 100% of the service connection opening. All cuts shall be free of burrs, frayed edges, or any restriction preventing free flow of the sewage. Excessive cuts, wrong holes, or trial cuts shall not be made and must be repaired at no cost to the Owner to the full satisfaction of the Engineer. In all cases, the invert of the lateral connection shall be cut flush with the invert entering the mainline to eliminate debris build-up.

A seal, consisting of a resin mixture or hydrophilic seal compatible with the installed CIPP, shall be applied at manhole/wall interface in accordance with the CIPP System manufacturer's recommendations.

Reconnections of existing services shall be made after the CIPP has been installed, fully cured, and cooled down. It is the Contractor's responsibility to make sure that all active service connections are reconnected.

External reconnections are to be made with a tee fitting in accordance with CIPP System manufacturer's recommendations. Saddle connections shall be seated and sealed to the new CIPP using grout or resin compatible with the CIPP.

Coupons of pipe material resulting from service tap cutting shall be collected at the next manhole downstream of the pipe rehabilitation operation prior to leaving the site. Coupons may not be allowed to pass through the system.

3.3 FINAL ACCEPTANCE

- A. Finish: The finished pipe shall be continuous over the entire length of sewer run between two manholes and be free from significant defects.
 - 1. Any defects which will affect the intended use, integrity or strength of the pipe shall be repaired, at the Contractor's expense, in a manner mutually agreed by the Owner and the Contractor.
- B. Inspection: After the work is completed, the Contractor shall provide the Owner with a videotape showing both the before and after conditions, including the reinstated service connections.
- C. Cleanup: After the installation work has been completed and all testing acceptable, the Contractor shall clean up the entire project area. All excess material and debris not incorporated into the permanent installation shall be disposed of by the Contractor.

END OF SECTION 330130.72

SECTION 330130.74 – CIPP CONNECTION WITH LATERAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 Specifications, apply to work of this section.
- B. Other Sections Referenced:
 - 1. Section 330130.01 – Sewer Collection System Rehabilitation
 - 2. Section 330130.02 – Sewer Line Cleaning
 - 3. Section 330130.03 – Sewer Flow Control
 - 4. Section 330130.17 – Television Inspection
- C. Other documents which should be considered part of and include in these specifications
 - 1. ASTM F-2561 Standard Practice for Rehabilitation of a Sewer Service Lateral and Its Connection to the Main Using a One-Piece Main and Lateral Cured-In-Place Liner.
 - 2. ASTM D-790 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
 - 3. ASTM D-792 Standard Test Methods for Density and Specific Gravity of Plastics by Displacement.
 - 4. ASTM D-2990 Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics.
 - 5. MD5813 Standard Specification for Cured-in Place Thermosetting Resin Sewer Pipe.

1.2 DESCRIPTION OF WORK

- A. This specification covers material requirements, installation practices, and test methods for the reconstruction of a sewer service lateral pipe and the main connection without excavation. The lateral pipe is renovated remotely from the main pipe to a sewer cleanout located within the public right of way. The pipe renovation shall be accomplished by the inversion and inflation of a resin impregnated, single-piece lateral and main connection liner assembly. The liner assembly is pressed against the lined main pipe by inflation of a bladder and held under pressure until the thermo-set resin has cured. When cured, the liner shall extend over a predetermined length of the service lateral and the full circumference of the main pipe connection forming a continuous, single-piece, tight fitting, corrosion resistant and verifiable non-leaking cured in-place pipe (CIPP) inclusive with gasket seals. The Materials and Installation practices shall adhere to the minimum requirements of ASTM F2561-11 “Standard Practice for Rehabilitation of a Sewer Service Lateral and its Connection to the Main Using a One-Piece Main and Lateral Cured-in Place Liner.”

1.3 QUALITY ASSURANCE

- A. In addition to the requirements of these specifications, comply with manufacturer's instructions and recommendations for work.

1.4 SUBMITTALS

- A. Submit the latest edition and any revisions thereto of the manufacturer's technical data and installation instructions.
- B. Submit Material Safety Data Sheet(s) for the resins, any other chemical additives, and any other chemicals used in the CIPP system.
- C. Submit certified copies of all test reports on the properties of the proposed resin materials prior to their use. Tests shall be performed by an approved independent testing laboratory or other approved source.
- D. Submit design calculations for the CIPP material thickness for each section of the pipe to be rehabilitated.

1.5 QUALIFIED BIDDER

- A. A qualified bidder for installing a mainline/lateral connection and lateral repair system shall use a Manufactured System that has a minimum of a five-year history of satisfactory performance and the Manufactured System shall have performed a minimum of 10,000 successful installations during this time period in the U.S., including 300,000 feet of lateral lining. Bidders shall be prepared to submit a list of installation projects, numbers of connections sealed, and lateral footage lined providing contact names, addresses, and telephone numbers for reference.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All equipment and material shall be of a type that has been generally been in use for a period of five (5) years. Work performed with experimental equipment or material will not be permitted without prior written consent of the Owner.
- B. The reconstruction shall be accomplished using a non-woven textile tube of particular length and a thermo-set resin with physical and chemical properties appropriate for the application. The lateral tube located within a translucent inversion bladder is vacuum impregnated with the synthetic resin and is then placed inside of a protective carrying device. The mainline portion of the liner is physically attached to the lateral portion and is affixed around a rigid "T" launching device. The protective "T" launching device is winched into the existing sewer. When the "T" launching device is properly positioned at the lateral connection, the mainline bladder is inflated by pressurized air that presses the main liner against the host pipe. The lateral portion is then inverted up through the lateral service line by the action of the inversion bladder. Once the resin-saturated liner is cured, the inversion bladder and launching/carrying devices are removed.

2.2 MATERIAL

- A. Liner Assembly - The liner assembly shall be continuous in length and consist of one or more layers of absorbent textile material i.e. needle punched felt, circular knit or circular braided tubes that meet the requirements of ASTM F1216 and ASTM D5813 Sections 6 and 8. No intermediate or encapsulated elastomeric layers shall be in the textile that may cause de-lamination in the cured in-place pipe. The textile tube and sheet shall be constructed to withstand installation pressures, have sufficient strength to bridge missing pipe segments, and flexibility to fit irregular pipe sections. The wet-out textile tube and sheet shall meet ASTM F 1216, 7.2 as applicable, and shall have a uniform thickness and 5% to 10% excess resin distribution that when compressed at installation pressures will meet or exceed the design thickness after cure.
- B. Mainline Liner Tube - The main sheet will be flat with one end overlapping the second end and sized accordingly to create a circular lining equal to the inner diameter of the main pipe. The interior of the textile sheet shall be laminated with an impermeable, translucent flexible membrane. The textile sheet before insertion shall be permanently marked on the membrane as a "Lateral Identification" correlating to the address of the building the lateral pipe provides service.
- C. Lateral Liner Tube - The exterior of the lateral liner tube shall be laminated with an impermeable, translucent flexible membrane. Longitudinal seams in the tube shall be stitched and thermally sealed. The lateral tube will be continuous in length and the wall thickness shall be uniform. The lateral tube will be capable of conforming to offset joints, bells, disfigured pipe sections and pipe diameter transitions up to 20% of the connection diameter.
- D. Mainline Connection - The main tube and lateral tube shall be formed as a one-piece assembly by stitching the lateral tube to the main sheet aperture. The connecting end of the lateral tube shall be shaped to match the aperture and curvature of the main tube. The lateral tube and main tube are connected by stitching and sealing the stitching using a flexible UV cured adhesive/sealant. The main and lateral tubes are assembled in the shape of a "T" or WYE with corresponding dimensions. Submittals for the liner assembly must include the manufacturers test protocol and tests data that certifies the connection between the liner tubes is leak-free, when subjected to a controlled vacuum leak test. The mainline tee that is to be sealed shall be a "T-Liner" type as manufactured by LMK Technologies; or equal.
- E. Gasket Seals - The mainline connection shall include a seamless molded flange shaped end seal gasket attached to the main liner tube by use of stainless steel snaps. The lateral tube shall include an O-ring gasket attached six inches from the upstream terminating end of the lateral tube.
- F. End Seal Test Data - The hydrophilic gaskets must include test data that reports substantial water-tightness at the terminating ends of a CIPP when subjected to hydrostatic loading that simulates subterranean conditions. Gasket seal submittals must include tests data simulating hydration/ dehydration conditions for a period of 10,000-hours and the test results must successfully demonstrate and document long-term performance without

deterioration, loss of material, flexibility, and expansion of the gasket during repeated cycles of hydration and dehydration.

- G. Bladder Assembly - The liner assembly shall be surrounded by a second impermeable, inflatable, flexible translucent membrane (translucent bladder) that will contain the resin and facilitate vacuum impregnation while monitoring of the resin saturation during the resin impregnation (wet-out) procedure.

2.3 RESIN SYSTEM

- A. The resin/liner system shall conform to ASTM D5813 Section 8.2.2 10,000 hour test.
- B. The resin shall be a corrosion resistant polyester, vinyl ester, epoxy or silicate resin and catalyst system that when properly cured within the composite liner assembly, meets the requirements of ASTM F1216, the physical properties herein, and those which are to be utilized in the design of the CIPP, for this project.
- C. The resin shall produce CIPP, which will comply with the structural and chemical resistance requirements of ASTM F1216.

Table 1 - CIPP Initial Structural Properties

Property	ASTM Test	Minimum Value	
		psi	(MPa)
Flexural Strength	D 790	4,500	(31)
Flexural Modulus	D 790	250,000	(1,724)

2.4 DESIGN CONSIDERATIONS

- A. The CIPP shall be designed per ASTM F1216, Appendix X1.
- B. The CIPP design for the lateral tube shall assume no bonding to the original pipe.
- C. Roughness Coefficient the liner must be smooth and have an average “n” factor of 0.0105 or lower.
- D. The CIPP shall be designed for a 50-year useful life or greater.
- E. The CIPP shall be designed as if the existing pipe were fully deteriorated.

PART 3 - EXECUTION

3.1 INSTALLATION RECOMMENDATIONS

- A. Access Safety – Prior to entering access areas such as manholes, an excavation pit, performing inspection or cleaning operations, an evaluation of the atmosphere to determine the presence of toxic or flammable vapors or lack of oxygen shall be undertaken in accordance with local, state, or federal safety regulations.

- B. Cleaning and Inspection – As per sections 330130.02 and 330130.17.
- C. Accessing the Lateral – The lateral pipe shall be remotely accessed from the main pipe for purposes of cleaning, pre-inspection, liner insertion and post inspection.
- D. Plugging – The upstream side of the cleanout shall be plugged during insertion and curing of the liner assembly ensuring no flows enter the pipe and no air, steam or odors will enter the building. When required, the main pipe flows will be bypassed. The pumping system shall be sized for normal to peak flow conditions. The upstream manhole shall be monitored at all times and an emergency deflating system will be incorporated so that the plugs may be removed at any time without requiring confined space entry.
- E. Inspection of Pipelines – The interior of the pipeline shall be carefully inspected to determine the location of any condition that shall prevent proper installation, such as roots, and collapsed or crushed pipe sections. These conditions shall be noted. Experienced personnel trained in locating breaks, obstacles, and service connections by closed circuit television shall perform inspection of pipelines.
- F. Line Obstructions – The existing service lateral shall be clear of obstructions that prevent the proper insertion and expansion of the lining system. Changes in pipe size shall be accommodated if the lateral tube is sized according to the pipe diameter and condition.

Obstructions may include dropped or offset joints of no more than 20% of the inside pipe diameter. Where a partial obstruction is caused by the lateral pipe being cocked at the wye connection and protruding into the wye, the protruding portion of the lateral pipe shall be trimmed to provide a clear passage of at least 80% of the inside pipe diameter.

- G. Resin Impregnation – The liner assembly is encapsulated within the translucent bladder (liner/bladder assembly) shall be saturated with the resin system (wet-out) under controlled vacuum conditions. The volume of resin used shall be sufficient to fill all voids in the textile lining material at nominal thickness and diameter. The volume shall be adjusted by adding 5% to 10% excess resin for the change in resin volume due to polymerization and to allow for any migration of resin into the cracks and joints in the original pipe. No dry or unsaturated area in the mainline sheet or lateral tube shall be acceptable upon visual inspection.
- H. Liner Insertion – The lateral tube and inversion bladder will be inserted into the carrying device. The mainline liner and bladder shall be wrapped around a “T” launching device and held firmly by pacing four (4) hydrophilic O-rings around the main liner. An adhesive sealant 300ml in volume is applied to the main/lateral interface and shall be applied as a two inch (2”) wide band on the main liner. Both the launching and carrying device are pulled into the pipe using a cable winch. The pull is complete when the open port of the “T” launching device is remotely positioned by use of sewer cameras to be aligned with the interface of the service connection and mainline pipe. The lateral tube is completely protected during the pull. The mainline liner is supported on a rigid “T” launcher that is elevated above the pipe invert through the use of a rotating skid system. The liner assembly shall not be contaminated or diluted by exposure to dirt, debris, or water during the pull.

- I. Bladder – The main bladder shall be inflated causing the main sheet to unwrap and expand, embedding the hydrophilic O-rings between the main liner and the main pipe as the main liner is pressed tight against the main pipe. The lateral tube is inverted by the action of the lateral bladder through the center of the main liner as it extends up into the lateral pipe to a distance of three (3) feet. The main/lateral bladder assembly shall extend past all ends of the liner, as no cutting and trimming shall be required.

3.2 CIPP PROCESSING

- A. Curing – After the liner has been fully deployed into the lateral pipe, pressure is maintained pressing the liner firmly against the inner pipe wall until the liner is cured at ambient temperatures or by a suitable heat source. The heating equipment shall be capable of delivering a mixture of steam and air throughout the liner bladder assembly to a uniform raise the temperature above the temperature required to cure the resin. The curing of the CIPP must take into account the existing pipe material, the resin system, and ground conditions (temperature, moisture level, and thermal conductivity of the soil). The heat source temperatures shall be monitored and logged during the cure and cool down cycles. The manufacturer's recommended cure schedule shall be submitted.
- B. CIPP Processing – Curing shall be done without pressure interruption with air or a mixture of air and steam for the proper duration of time per the resin manufacturer's recommendations. The curing process is complete when the temperature of the CIPP reaches 100 degrees Fahrenheit or less, the processing shall be finished.

3.3 FINISH

- A. The finished CIPP – CIPP Shall be a homogenous liner assembly located within a lateral service pipe for a specific length, and extending into the main pipe to renew 16-inches of the main pipe (5" on either side of a 6" lateral or 6" on either side of a 4" connection). The CIPP shall smooth with minimal wrinkling and increase flow rate. The CIPP shall be free of dry spots, lifts, and delaminated portions. The CIPP shall include an engineered taper at each end providing a smooth transition to the host pipe for accommodating video equipment and maintaining proper flow in the mainline. After the work is completed, the installer will provide Owner with video footage documenting the repair and the visual markings identifying the sewer lateral address as completed work. The finished product must provide an airtight/ watertight verifiable non-leaking connection between the main sewer and sewer service lateral.

3.4 INSPECTION AND TESTING PRACTICES

- A. Sampling – It is required by the Owner, that the Contractor shall prepare a CIPP sample. The sample shall be prepared by securing a flat plate mold using the textile tube material and resin system as used for the rehabilitated pipe.
- B. Pressure – The pressure applied on the plate sample will be equal to the highest pressure exerted on the lateral tube during the inversion process.

- C. Length – The minimum length of the sample must be able to produce at least five specimens for testing in accordance with ASTM D-790-03.
- D. Conditioning – Condition the test specimens at $73.4 \pm 3.6^{\circ}$ F ($23 \pm 2^{\circ}$ C) and $50 \pm 5\%$ relative humidity for not less than 40 hours prior to test in accordance with Practice ASTM D 618, for those tests where conditioning is required.
- E. Short-Term Flexural (Bending) Properties – The initial tangent flexural modulus of elasticity and flexural stress shall be measured for gravity and pressure pipe applications in accordance with Test Method D 790 and shall meet the minimum requirements of Table 1.
- F. CIPP Wall Thickness – The minimum wall thickness at any point shall not be less than 87.5% of the specified design thickness as agreed upon between Owner and Contractor.
- G. Gravity Pipe Leakage Testing – It is required by the Owner that Contractor shall test five percent (5%) of the sealed connections. The contractor shall use an air test method where a test plug is placed adjacent to the upstream and downstream ends of the main sheet CIPP and at the upper most end of the lateral tube. This test should take place after the CIPP has cooled down to ambient temperature. The test pressure shall be 4 PSI for a three-minute) minute test time and during this time the pressure shall not drop below 3.5 PSI.

3.5 WARRANTY

- A. All CIPP liners shall be certified by the manufacturer for specified material properties for a particular job. The manufacturer warrants the liner to be free from defects in raw materials for ten (10) years from the date of acceptance. The Contractor guarantees the work to be free from defects caused by faulty workmanship and/or materials for a period of ten (10) years. During the warranty period, any defects which affect the integrity, strength or water tightness of the pipe shall be repaired at the Contractor's expense.
- B. The Contractor shall carry Professional Liability Coverage and provide proof of insurance during the term of the contract.

END OF SECTION 330130.74

SECTION 330130.84 - SEWER MANHOLE LINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 SUMMARY

- A. It is the intent of this portion of the work to provide for the installation of 42-inch or 48-inch diameter manhole liners with reducer cone sections (see Standard Drawing).

1.3 QUALITY ASSURANCE

- A. In addition to the requirements of these specifications, comply with manufacturer's instructions and recommendations for work.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and application instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. The materials recommended for lining manholes shall be equal to that manufactured by Owens-Corning Fiberglass and shall be engineered to a standard of 16,000-pound vertical dynamic wheel load (AASHTO H-20). The manhole shall be fitted with a fiberglass reducer cone with no sidewall joints, seams or sections. The manhole liner shall meet all requirements of ASTM Specification D 3753 for Glass Fiber-Reinforced Polyester Manholes.

PART 3 - EXECUTION

3.1 INSTALLATION PROCEDURES

- A. The following procedures shall be followed for the installation of manhole liners:
 - 1. Excavate an area round the top of the existing manhole sufficiently wide and deep for removal of old castings, ring and cover, and reducer cone section.
 - 2. The bottom of the manhole liner shall be cut to fit existing manhole base as closely as possible. Cutouts in manhole liner shall be made to accommodate existing inlets, drops, and cleanouts. Cuts should be precisely made with a power saw fitted with masonry-type blade or with a special jigsaw.

3. The manhole liner shall be lowered into the existing brick or concrete manhole and set into a quick-setting grout mixture. Good bottom seal shall be obtained in order to prevent loss of grout from the annular space between the outside of the manhole liner and the interior of the old manhole. A 6-inch height of a quick-setting grout shall be placed above the initial bottom seal in the annular void area between the manhole liner and the existing brick or concrete manhole to insure adequacy of the bottom seal. The gap from drops, cleanouts, laterals, and existing piping between the existing manhole wall and the new manhole liner wall shall be bridged with short lengths of PVC, clay, or other corrosion-resistant pipe approved by the Engineer. Quick-setting mortar shall be used to seal around all pipes.
4. The annular void between the manhole liner and existing brick or concrete manhole shall be filled with a Portland cement and sand grout. The grout shall be made with four bags of cement per cubic yard of sand.
5. Excavation, backfilling, and restoration shall be as required to match existing surfaces.
6. The existing ring and cover shall be reused and finished to grade by constructing a chimney on the flat shoulder of the manhole liner using brick and mortar or precast concrete rings. In no case shall the cast iron ring be placed directly on the manhole liner.

3.2 MEASUREMENTS FOR PAYMENT

- A. All measurements shall be as specified or made by conventional means with accuracies consistent with field conditions and common practice. Should a discrepancy in measurement exist which is greater than 10%, the item in question shall be re-measured by both the Contractor and the Engineer for verification.
- B. Measurements for payments shall be based on the following schedule:
 1. SEWER MANHOLE LINING, including all materials, shall be paid for at the unit price bid per manhole. Measurement shall be based on the actual number of manholes lined in the various categories.

END OF SECTION 330130.84

SECTION 333100 - SANITARY SEWER SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. Furnishing all labor, materials, tools, equipment, and services for all sanitary sewers as shown on the Drawings.
- B. Although such is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances, and devices incidental to or necessary for a functional and complete installation.

1.2 RELATED DOCUMENTS AND SECTIONS

- A. Section 013319 – Field Testing Requirements
- B. Section 015713 – Temporary Erosion Control
- C. Section 030000 – Concrete Work
- D. Section 310000 – Earthwork
- E. Cuyahoga County Department of Public Works “Uniform Standards for Sewage Improvements” dated 2019.

1.3 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

- A. Granular pipe bedding and cover material specified in Section 310000 - Earthwork
- B. Special backfill material specified in Section 310000 - Earthwork

1.4 SUBMITTALS

- A. Product Data
 - 1. PVC pipe, each type specified
 - 2. Polypropylene dual wall pipe
 - 3. Manhole castings
 - 4. Precast concrete manholes
 - 5. Manhole steps
- B. Shop Drawings
 - 1. Precast concrete manholes showing:
 - a. Orientation plan for each manhole or inlet indicating where all pipes connect.
 - b. The size and elevation of connecting pipes.
 - c. Details of drop connections.

- d. Invert concrete channeling details.
 - e. Pipe to manhole connection details.
 - f. Casting and step orientation.
- C. Quality Control Submittals
 - 1. Design Data
 - 2. Test Reports
 - 3. Certificates
 - a. Evidence of current membership in specified manufacturer's associations.
 - c. Evidence of National Precast Concrete Association (NPCA) certification for the manufacture of precast concrete manholes.
 - 4. Manufacturers Instructions
- D. Contract Closeout Submittals
 - 1. Project Record Documents
 - 2. Operation and Maintenance

1.5 REFERENCES

- A. ASTM C-150 Standard Specification for Portland Cement
- B. ASTM C-270 Standard Specification for Mortar for Unit Masonry
- C. ASTM C-443 Standard Specifications for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
- D. ASTM C-478 Standard Specifications for Precast Reinforced Concrete Manhole Sections
- E. ASTM C-990 Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
- F. ASTM C-1173 Standard Specification for Flexible Transition Couplings for Underground Piping Systems
- G. ASTM D-2321 Standard Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe
- H. ASTM D-3034 Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- I. ASTM D-3212 Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- J. ASTM F-477 Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

- K. ASTM F-679 Standard Specification for Poly(Vinyl Chloride) (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings

1.6 QUALITY ASSURANCE

- A. Qualifications - Work shall be performed by personnel meeting requirements identified in section 014323 – Qualifications of Tradesmen.
- B. Regulatory Requirements – The project is subject to the Build America, Buy American Act (BABA). All materials used for earthwork shall be in accordance with the requirements set forth in BABA.
- C. Certifications – The Contractor shall provide certification that all materials meet requirements identified in plans, specifications, and bid/contract documents.
- D. Field Testing – All pipe and manhole testing shall be in accordance with testing requirements detailed within this section, section – Field Testing Requirements, and Cuyahoga County Department of Public Works “Uniform Standards for Sewage Improvements
- E. Pre-Construction Meeting – The Contractor, Engineer, and Owner shall meet at a minimum ten (10) business days prior to the mobilization of equipment and materials to the project site. No work shall commence until a pre-construction meeting is held and the work plan by the Contractor is approved by the Engineer.

1.7 PROJECT CONDITIONS

- A. Environmental Requirements
 - 1. All work shall be performed in accordance with erosion control and stormwater pollution prevention measures detailed in section 015713 – Temporary Erosion Control.
- B. Existing Conditions
 - 1. Verify locations of underground utilities.
 - 2. Protect existing structures and utilities from damage. Repair if damaged by this work.
 - 3. Do not change pipe sizes without securing written approval of Engineer.
- C. Field Measurements
 - 1. If it becomes necessary to change location of sanitary sewer lines due to underground utility interference, secure approval of Engineer.
 - 2. If Contractor initiated, make changes approved by the Engineer without added cost to Owner.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to the site, store and protect under provisions of Section 016600 - Product Handling and Protection.

- B. Acceptance at Site
 - 1. All material and all equipment shall be subject to visual inspection and acceptance or rejection after delivery to the site of the work. All rejected material shall immediately be removed from the site.
- C. Comply with all provisions of Section 013543 – Environmental Protection.

1.9 SEQUENCING AND SCHEDULING

- A. Perform no pipe work in fill areas until embankment or fill has been completed to at least two (2) feet above proposed top of pipe and fill has been properly compacted.

PART 2 - PRODUCTS

2.1 PIPE

- A. Polyvinyl Chloride Pipe (PVC) 4" - 15" Diameter, less than 13' of cover over top of pipe
 - 1. All polyvinyl chloride pipe in this size range shall conform to ASTM F-949, SDR 35, shall be integral bell and spigot type, with joints conforming to ASTM D-3212 and elastomeric seals conforming to ASTM F-477.
 - 2. All pipe and fittings shall be marked or stenciled in conformance with ASTM D-3034. All gaskets shall be marked or stenciled with the ASTM specification designation, name or trademark of the manufacturer, and pipe size.
 - 3. Acceptable manufacturers shall be current members of the Uni-Bell Plastic Pipe Association.
- B. Polyvinyl Chloride Pipe (PVC) 4" - 15" Diameter, greater than 13' of cover over top of pipe
 - 1. All polyvinyl chloride pipe in this size range shall conform to ASTM F-949, SDR 26, shall be integral bell and spigot type, with joints conforming to ASTM D-3212 and elastomeric seals conforming to ASTM F-477.
 - 2. All pipe and fittings shall be marked or stenciled in conformance with ASTM D-3034. All gaskets shall be marked or stenciled with the ASTM specification designation, name or trademark of the manufacturer, and pipe size.
 - 3. Acceptable manufacturers shall be current members of the Uni-Bell Plastic Pipe Association.

2.2 PRECAST CONCRETE MANHOLES

- A. All precast manhole units shall be manufactured in accordance with the provisions of ASTM C-478.

- B. Joints between manhole units shall be gasketed and shall comply with the requirements of ASTM C-443. All gaskets shall be marked or stenciled with the ASTM specification designation, name or trademark of the manufacturer, and pipe size.
- C. The standard length of riser units shall be 48 inches. Lengths of 32 inches or 16 inches shall be used to meet required dimensions.
- D. Openings for connecting pipes in riser units, bottom riser units, integral base units, and for access in flat slabs shall be preformed or cored by the manufacturer. Cut-out openings shall be made immediately after the pipe is removed from the casting form.
- E. Connectors between new precast concrete manholes and pipes shall be made by casting the connector integrally with the manhole wall. The connectors shall be composed of EPDM with stainless steel take down bands for compressing the connector against the outside diameter of the pipe. The connectors shall comply with the requirements of ASTM C-923, and shall be "Z-Lok" Type as manufactured by A-Lok Products; or an approved equivalent.
- F. All openings in existing manholes shall be field cored and shall have mechanical connectors complying with the requirements of ASTM C-923 and shall be equal to Kor-N-Seal as manufactured by NPC, Inc., Milford, NH.
- G. Annular spaces at pipe entrances shall be field sealed with a one component, hydraulic cement based, fast setting repair mortar equal to Thoro Products Waterplug as manufactured by ChemRex Inc., Shakopee, MN.
- H. The top four (4) inches to twelve (12) inches of the manhole shall provide for adjustment of casting to grade. Adjustment shall be through the use of a maximum of two (2) precast concrete adjusting collars.
- I. Where pressure tight manhole frames and covers are specified, threaded inserts shall be cast in eccentric cones or flat slab tops, and holes formed or cored in adjusting rings to match bolt size and spacing specified for manhole casting.
- J. Where required by the drawings, manhole coatings shall be an acrylic modified cementitious, high-build, waterproof coating equal to Thoroseal Foundation Coating as manufactured by ChemRex Inc., Shakopee, MN.
- K. Precast concrete shall be manufactured by an NPCA certified plant.

2.3 MANHOLE STEPS

- A. All steps shall be minimum of twelve (12) inches in width with safety side lugs to prevent slipping and shall conform to the latest OSHA requirements. Manhole steps shall be of polypropylene plastic reinforced with a 3/8", No. 60 grade epoxy coated reinforcing rod.

- B. Manhole steps shall conform to the requirements of ASTM C-478.
- C. Acceptable manufacturers are:
 - 1. American Step Company, Inc.
 - 2. Lane International, Inc.
 - 3. M. A. Industries, Inc.

2.4 CASTINGS

- A. All castings shall be true to pattern and free from cracks, gas holes, flaws and excessive shrinkage. Surfaces shall be free from burnt-on sand and shall be reasonably smooth. Runners, fins, risers and other cast-on pieces shall be removed. Castings for manhole frames and covers and for any other purpose under these specifications shall conform to all the requirements for Class No. 30B for Gray Iron Castings of the ASTM A-48/A-48M. All castings shall be commercially machineable and, in the case of manholes, the frame and cover shall be so machined that it will be impossible to rock the cover after it has been seated in the proper position in the frame.
 - 1. Manhole frames and covers shall be as detailed on the Drawings.
 - 2. Frame and cover shall be painted with one coat of the manufacturer's standard asphaltum paint.

2.5 MASONRY MORTAR

- A. Mortar shall conform to ASTM C-270, Type M, but shall not contain masonry cement.
- B. Mortar shall be UltraMortar Type M as manufactured by UltraKote Products, Inc. or Lafarge Mortar Cement, Type M as manufactured by Lafarge Corporation, or approved equal.
- C. Only sufficient mortar shall be prepared for immediate use, and any mortar that has set shall not be retempered or used in the work.
- D. Setting accelerators or anti-freeze compounds shall not be used.

2.6 MANHOLE ENCAPSULATION MATERIALS

- A. Manhole encapsulation material shall be irradiated and cross-linked polyethylene impermeable backing, coated with protective heat-activated adhesive. Material width shall be sufficient to extend 4-inches below the cone unit-grade ring joint and 4-inches above the grade ring-frame joint.
- B. The manhole encapsulation material shall be as manufactured by Canusa, Division of Shaw Resources Inc., The Woodlands, TX or equal.
- C. Primer shall be as recommended by the manufacturer.

2.7 PREFORMED BUTYL MASTIC SEALANT

- A. Preformed butyl mastic sealant material shall be furnished in 1-inch wide strips conforming to the requirement of ASTM C-990.
- B. The butyl mastic sealant shall be Bidco C-56 as manufactured by Bidco Sealants, Inc., Park Hills, MO or equal.

2.8 COUPLINGS

- A. Couplings for connecting dissimilar pipe materials or pipe sizes shall be a rubber type coupling with a sealing "O" ring under each of two sealing clamp bands and a Type 316 stainless steel shear ring. Coupling shall be manufactured with natural and synthetic rubbers conforming to ASTM C 425 and ASTM C 1173.
- B. Coupling shall be Flex-Seal Adjustable Repair Coupling as manufactured by the Mission Rubber Company, Corona, CA, or approved equal.

PART 3 - INSTALLATION

3.1 ALIGNMENT AND GRADE

- A. Horizontal and Vertical Control
 - 1. All horizontal and vertical control required for the complete layout and performance of the Work under this contract shall be done by a registered surveyor at the Contractor's expense, and any observations by the Engineer of the Contractor's methods will not relieve the Contractor of his responsibility.
 - 2. The Contractor shall be solely responsible for the accuracy of all horizontal and vertical control.
- B. Alignment and grade shall be established by means of a laser beam.
- B. The Contractor shall furnish all material and labor to establish line and grade of the generated laser beam from the benchmarks and control points indicated on the Drawings. The laser shall be securely anchored and checked periodically by the Contractor. The laser calibration shall be demonstrated when requested by the Engineer. Strict adherence to the manufacturer's operation procedure shall be observed. Only qualified and trained employees may be assigned to install, adjust, or operate laser equipment, and proof of qualifications of the equipment operator must be available at all times. Areas in which lasers are used must be posted with standard laser warning placards, and the laser beam shall be turned off when not needed. During rain, snow, dust, excessive heat, or fog the operation of laser systems shall be prohibited where practicable because of beam scatter.

3.2 PIPE INSTALLATION

- A. All pipe installation shall conform to the trench and bedding details shown on the Drawings.
- B. PVC and Polypropylene Dual Wall pipe shall be installed in full compliance with ASTM D-2321.
- C. Only one type and strength of pipe shall be used between any two consecutive manholes, unless otherwise shown on the Drawings.
- D. After the trench has been excavated and the pipe bedded , the pipe shall be laid to the line and grade as shown on the Drawings. All joints shall be made as hereinafter specified. In no case shall any material except bedding material be placed under the bell of the pipe to secure proper grade.
- E. Prior to being lowered into the trench, each pipe shall be carefully inspected and those which are damaged or not meeting the specified requirements shall be rejected and clearly marked as rejected and removed from the Work. Satisfactory means shall be used to hold the pipe in line until embedment of pipe is complete. Precautions shall be taken to insure that the spigot end of the pipe being laid is pushed the proper depth into the bell of the preceding pipe.
- F. All conduit shall be laid starting at the outlet end and laid with the bell end upstream.
- G. In no case shall more than thirty (30) feet of trench be opened in advance of the pipe laying operations.
- H. Conduit shall not be laid in water, mud, or any otherwise unsuitable trench. No drainage shall run through the newly laid pipe. All sewers shall be temporarily capped with a watertight seal at the open ends at the completion of each day's work and no drainage water shall be permitted to flow through the sewer.
- I. All trenches and excavations shall be backfilled as specified as soon as possible after the pipe is laid and jointed. Where concrete encasement or cradle is used, pipe shall not be backfilled for at least twenty four (24) hours after placing concrete except that pipe may be covered to a depth of not to exceed sixteen (16) inches over the top of the pipe.

3.3 JOINTING

- A. Polyvinyl Chloride (PVC) Pipe and Polypropylene Dual Wall Pipe
 - 1. Dust, dirt and foreign matter shall be removed from joint surfaces. When jointing pipe using the required compression type joint, a lubricant recommended by the gasket manufacturer shall be used. The gasket shall be lubricated by drawing it through lubricant held in the hand of the worker, thus coating the entire surface of the gasket.

2. When laying the pipe in concrete bedding, care shall be exercised to prevent the joint materials from coming in contact with the fresh concrete until after the joint has been completed.

3.4 PERMISSIBLE DEFLECTION AT JOINTS

- A. No pipe deflections or springing of joints, to effect a change in direction will be allowed, except by permission or direction of the Engineer, or as shown on the Drawings. Any permitted or directed deflection shall be a maximum of 80 percent of the allowable deflection value established by the pipe manufacturer.

3.5 MANHOLES

- A. Build each manhole to dimensions shown on Drawings and at such elevation that pipe sections built into wall of manhole will be true extensions of line of pipe.
- B. Set frames for manholes, within areas to be paved, to final grade. In asphalt pavement, surround frames set to grade with a ring of compacted asphalt concrete base material immediately after backfilling operations are complete. Place asphalt concrete mixture up to one (1) inch below top of frame, slope to grade, and compact with hand tamp.
- C. Precast bases shall be placed on a bed of crushed gravel or crushed limestone, meeting AASHTO M 43 gradation, having a minimum thickness of three (3) inches. The bedding shall be compacted and provide uniform support for the entire area of the base.
- D. Provision shall be made for a minimum of four (4) inches and a maximum of twelve (12) inches of precast concrete grade rings between the uppermost precast section and the bottom of the cast iron manhole frame in order to set manhole cover to grade.
- E. No more than two lifting holes or other lifting devices shall be utilized for handling the precast sections. All lifting holes shall be acceptably sealed with a hydraulic cement based, fast setting repair mortar, meeting the requirements of Article 2.2 of this Section, prior to backfilling around the manhole.
- F. Inverts shall be formed to the equivalent of half-pipes in concrete and as follows:
 1. Carry concrete out to the manhole wall with a slope of $\frac{1}{2}$ in./ft. from the top of the half-pipe.
 2. The bottoms of all manholes shall be channeled to conduct flow in the planned direction. Channels shall be the true shape of the lower half of the sewer pipe and shall match inverts of connecting pipe at the manhole wall.

3.6 DROP MANHOLES

- A. Where shown on the plans, drop manholes shall be built in accordance with the Drawings.

3.7 MAINTAINING SEWAGE FLOW

- A. The Contractor shall be required to maintain the flow in all existing live sewers during construction and the method employed shall be approved by the Engineer.

3.8 REPLACING, MOVING AND REPAIRING OF EXISTING UTILITIES

- A. The Contractor shall replace, move, support, or repair and maintain all pipes for water, steam, air or gas, and all wire conduit(s), and all other structures encountered in the work and repair all damage done to any of the said structures and appurtenances through his acts or neglect and shall keep them in repair during the life of the Contract. The Contractor shall in all cases leave them in as good condition as they were previous to the commencement of the work and to the full satisfaction of the Owner.

3.9 CONNECTION TO EXISTING SEWER SYSTEM

- A. The Contractor shall make connections to the existing sewer system as shown on the Drawings. The connections shall be made by the Contractor at such hours that will cause the least disturbance to the flow in the existing sewer system. The Contractor, however, shall notify the Engineer at least five working days in advance of the time he desires to make the connections and no such connections shall be made until the permission of the Engineer is obtained.

3.10 CLEAN-UP

- A. Before final acceptance for the Work, the Contractor shall clear the sewers of any mortar, dirt or other refuse that may have been left or accumulated in the sewers. All manholes and other structures shall be cleared of all forms, scaffolding, bulkheads, centering, surplus mortar, rubbish or dirt and left in a clean and proper condition.

3.11 DEFECTS TO BE MADE GOOD

- A. If, at any time before the completion of the contract, any broken pipes, or any defects, are found in the sanitary sewers or in any of their appurtenances, the Contractor shall cause the same to be removed and replaced by proper material and workmanship, without extra compensation for the labor and material required. All materials shall be carefully examined by the Contractor for defects before placing and any found defective shall not be placed in the line.

END OF SECTION 333100

SECTION 40 05 23

STAINLESS STEEL PROCESS PIPE AND TUBING

PART 1 GENERAL

1.01 SUMMARY

A. This Section specifies stainless steel pipe and fittings.

1.02 QUALITY ASSURANCE

A. References:

1. This section contains references to the following documents. They are a part of this section as specified and modified. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.
2. Unless otherwise specified, references to documents shall mean the documents in effect at the time of Advertisement for Bids or Invitation to Bid (or on the effective date of the Agreement if there were no Bids). If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, regardless of whether the document has been superseded by a version with a later date, discontinued or replaced.

Reference	Title
ANSI B31.3	Process Piping
ASME Section IX	Boiler and Pressure Vessel Code; Welding and Brazing Requirements
ASTM A480	General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
AWWA M11	Steel Pipe-A Guide for Design and Installation
AWWA C227	Bolted, Split-Sleeve Restrained and Non-Restrained Couplings for Plain-End Pipe
AWWA C606	Grooved and Shouldered Joints
CSA W48.3	Low Alloy Steel Covered Electrodes for Shielded Metal Arc Welding

1.03 ADMINISTRATIVE REQUIREMENTS

Coordination required with the design of piping supports (hangers, guides, anchors, structural attachments, etc.), expansion joints, and expansion control and seismic restraints

1.04 SUBMITTALS

A. Action Submittals:

1. Procedures: Section 013323.
2. Qualifications of the Design Professional charged with inspection and certification of pipe hangers and supports and related scope of work; provide educational background, proof of registration, and proof of insurance and previous experience in performing this type of work. No further submittals under this section will be considered until the Design Professional's qualifications have been reviewed and accepted by the OWNER.
3. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with addendum updates included, with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (✓) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the CONTRACTOR, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The CITY shall be the final authority for determining acceptability of requested deviations. The remaining portions of the paragraph not underlined will signify compliance on the part of the CONTRACTOR with the specifications. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.
4. Piping layout drawings including supports. Indicate assembly details, location and placement of field welds, unions and flanges, fittings, valves, flushing connections, drains, sample taps, cathodic protection, seismic restraint system, expansion joints, guides, anchors, hangers, supports, and the provisions for thrust restraint, as well as any other pertinent details and appurtenances for all piping, including wall and floor penetrations, where applicable, in that area. Indicate location and clearances from structures and other utilities (ductwork, conduit, electrical tray, etc.). Include details of connections to new and existing equipment, piping and structures. Submit original layouts by the Contractor; photocopies of Contract Drawings are not acceptable.
5. Manufacturers' product data, catalog cuts, typical installation details, and dimensions. Indicate on the submittal each piping system where the product will be used.

6. Pipe wall thickness calculations for pipe fabricated per AWWA C220. Demonstrate the maximum permissible internal design pressure in the pipe based on the wall/shell thickness specified in the Piping System Schedule for the associated Process Service and pipe size and the support and/or bedding conditions specified on the Drawings. Steel pipe design calculations conform to AWWA M11.
7. Pipe wall thickness and reinforcement calculations for fittings fabricated per AWWA C226. Demonstrate that the maximum permissible internal design pressure for fabricated fittings matches or exceeds the maximum permissible internal design pressure in the connecting pipe for the support and/or bedding conditions specified on the Drawings. Fabricated steel pipe fitting design calculations conform to AWWA M11.
Welding: Prior to commencing any welding of stainless steel pipe, supports, and/or structural attachments, provide a written description of welding techniques, including, but not limited to, materials, methods, and quality control. Identify differences in shop and field techniques. Indicate in the submittal that the welding technique is acceptable for the intended service condition and area exposure. Written procedures to be stamped and sealed by a Professional Engineer registered in the State of Ohio and qualified for welding design.
8. Calculations for any pipe and fittings that are not fabricated per one of the components standards listed in the specified ASME B31 code.
9. Submit calculations for engineered flange face rings in accordance with Appendix D of ASME Section VIII Division 1.

B. Informational Submittals:

1. Procedures: Section 013323.
2. Manufacturers' certificates of compliance with specified industry standards.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Procedures: Section 013326 for Shipment and Storage.
- B. Deliver pipe and fittings with end protectors in place. Do not remove protectors until materials are about to be installed.
- C. Prevent carbon steel contamination of stainless steel pipe and fittings during storage, handling, fabrication, and installation.

1.06 PIPING SYSTEM DESIGN

A. Design Professional:

1. Provide professional engineering services (“Design Professional”) for the design and inspection of piping systems work included in this section. The Design Professional must have not less than ten years’ experience in the type of piping support, seismic restraint, and expansion control design work required for this project.
2. The Design Professional shall be a professional engineer currently licensed to practice in the State of Ohio.
3. The Design Professional must obtain and maintain professional liability insurance in the amount of \$1,000,000 aggregate, to be in effect for the duration of this project plus one year.
4. The requirements for the Design Professional shall not be construed as relieving the Contractor of overall responsibility for this portion of the work.

B. Piping System Design and Inspection:

1. The Design Professional shall provide the design, inspection, and certification for piping supports (hangers, guides, anchors, structural attachments, etc.), expansion control and seismic restraints as specified in this Section and referenced Sections.
2. The work of the Design Professional is complementary to the design elements specified in the Contract Documents and intended to provide complete piping system designs. The Design Professional’s inspection responsibilities also complement inspections by the Owner. The contract documents have provided minimum criteria for the Design Professional’s use.
3. Include all elements of piping systems required for fabrication and construction in the piping layout submittals. Depict couplings, support, restraint, anchorage, expansion control measures and other elements of the piping system.

PART 2 PRODUCTS

2.01 MATERIALS

- A. All pipe system materials to be new, free from defects and conforming to the requirements and standards specified in this section.

B. Pipe.

1. Use pickled and annealed sheet or plate for manufacture of fabricated stainless steel pipe.
2. Finish.
 - a. 8-gage through 16-gage material: No. 1 or 2B per ASTM A480.
 - b. 3/16-inch and heavier plate material: No. 1 mill finish per ASTM A480, “Hot-Rolled or Cold-Rolled, and Annealed or Heat Treated, and Blast Cleaned or Pickled.”

C. Shop-fabricated stainless steel pipe and fittings.

1. Furnished by a single manufacturer who is experienced and qualified in the manufacture and fabrication of the items to be provided.
2. Manufacture using Weld Procedure Specifications (WPS) that have been qualified under ASME Section IX. Document qualifications in Procedure Qualification Reports (PQR). Use only certified welders who have successfully completed performance qualification tests per ASME Section IX for manufacture of stainless steel pipe.

D. Flanges.

1. Plate steel backing ring flanges, AWWA C207 Class D minimum thickness.
2. Ductile iron backing ring flanges with the following flange thicknesses.

Flange Size, in	Flange Thickness, minimum, in.
3	1/2
4	9/16
6 thru 10	5/8
12 thru 16	3/4
18 thru 22	7/8
24 thru 30	1
36	1-1/8
42	1-1/4
46 to 54	1-3/8
60	1-1/2

3. Stub ends.

- a. Wall thickness equal to or greater than pipe or fitting to which it is welded.
- b. Lap face/gasket mating surfaces clean, free of debris, with welds ground flush and surface roughness between 3.18 and 12.7 microns RMS.

E. Fittings.

1. Double ferrule compression fittings capable of holding the full bursting pressure of connected tubing.
2. Candidate manufacturers for double ferrule compression fittings.
 - a. Swagelok.
 - b. Gyrolok.
 - c. Approved Equal.
3. Provide straight tapered reducers. Flanged & flued reducers and bushing type adapters are not permitted.

4. Pressure rating and thickness of elbows, tees, crosses, and wyes equal to or greater than connecting pipe.
- F. Grooved couplings and fittings.
1. Flexible and rigid coupling with pipe grooves compliant with AWWA C606.
 2. When pipe wall thickness does not meet the minimum requirements of AWWA C606 for rolled or cut groove joints, provide shoulder ends per the requirements of AWWA C606.
 3. Candidate manufacturers.
 - a. Victaulic Style 77 SS Type 316
 - b. Approved equal.
- G. Bolted split sleeve couplings.
1. AWWA C227 compliant sleeve with single or double arch cross section of the same material as pipe. Body thickness equal to or greater than that of connecting pipe wall thickness.
 2. Candidate manufacturers.
 - a. Victaulic, Style 231S through 234S.
 - b. Approved equal.
- H. Piping support, seismic restraints, pipe anchors, nuts, bolts, washers and fasteners.
1. Type 316 stainless steel

2.02 DISSIMILAR METAL CONNECTIONS

- A. Not allowed.

2.03 SHOP FABRICATION

- A. Metal forming processes.
1. Use pinch rolls with a hard chrome finish to form cylinders. Thoroughly clean the rolls using Avesta BlueOne™ 130 Pickling Paste or approved equal, prior to roll forming the pipe. Alternatively, provide a protective barrier between the stainless steel plate/sheet and the plate rolls during the forming process.
 2. Provide a protective barrier between pipe welding rollers and the stainless steel pipe cylinder. Alternately, new rollers or rollers that have been turned down on a lathe to provide a new and clean working face may be used.
- B. All saws, drills, files, wire brushes, grinding wheels, etc. will be free of carbon contamination and designated for stainless steel use only.
- C. Provide nonferrous, stainless steel, or rubber-lined pipe storage and fabrication racks.
- D. Use nylon slings or straps for handling stainless steel piping.

E. Preparation of surfaces to be welded.

1. Surfaces of joints to be welded are to be free from mill scale, slag, grease, oil, paint, rust, and other foreign material.
2. Use only stainless wire wheels and grinding wheels that have not come into contact with carbon steel.
3. Flame cutting or any use of oxy-acetylene gas cutting tools is prohibited. Use plasma arc torch with a nitrogen or argon-hydrogen carrier gas, laser or waterjet processes for cutting and plate beveling.
4. Air arc and gas backgouging are prohibited. Use grinding and plasma gouging methods to achieve full penetration welds.

F. Welding.

1. Welding and production processes are to conform to ASME B31.3.
2. Use of Solar Flux is prohibited.
3. Use of FCAW welding is prohibited.
4. Pipe and fittings with wall thickness up to 11-gage (1/8-inch): Weld using the GTAW process.
5. Pipe and fittings with wall thicknesses greater than 1/4-inch may be welded using an automated SAW process.
6. Pipe and fittings with wall thickness greater than 11-gage (1/8-inch): Bevel and complete root pass using the GTAW process, followed by subsequent passes with the GTAW, GMAW, or Metallic Arc SMAW process.
7. Filler material:
 - a. Add only ELC wire grades to provide a cross section at the weld equal to or greater than the parent metal.
 - b. SMAW electrodes to conform to CSA W48.3.
8. Make weld deposit smooth and evenly distributed and with a crown of no more than 1/16-inch on the I.D. and 3/32-inch on the O.D. of the piping. Concavity, undercut, cracks, or crevices are not permitted.
9. Full penetration butt welds: Provide inert gas shielding to the interior and exterior of the joint.
10. Lap joints: Provide full thickness seal welds on both joints.

G. Remove excessive weld deposits, slag, spatter, and projections by grinding. Grind welds smooth on gasket surfaces. Tack welds, clips, and other attachments.

1. Repair nicks, gouges, notches, and depressions in the base metal in the area before the joint weld is made.
2. Remove tack welds, clips, and other attachments and repair defects, except where the tack welds occur within the weld area and these tack welds do not exceed the size of the completed weld. Remove cracked tack welds.
3. Grind those areas to be repaired down to clean metal and then repair by building up with weld metal. Grind the repaired areas smooth to form a plane surface with the base metal.

H. Defects and repairs.

1. Remove welds with cracks, slag inclusions, porosity, undercutting, incomplete penetration, or which are otherwise deficient in quality or made contrary to any provisions of these specifications, by chipping or grinding throughout their depth to clean base metal.
2. Do not perform calking or peening of welds to correct defects.
3. Enlarge welds found deficient in dimension but not in quality by additional welding after thoroughly cleaning the surface of previously deposited metal and the adjoining plate.
4. Remove weld deposits, slag, weld spatter, and projections into the interior of the pipe by grinding.

I. Finish.

1. Treat all welded joints with Avesta BlueOne™ 130 Pickling Paste or approved equal and rinse with clean water.
2. If rusting of embedded iron occurs, pickle the affected surface with Avesta BlueOne™ 130 Pickling Paste or approved equal.
3. Rinse clean using Avesta FinishOne Passivator 630 or approved equal.

PART 3 EXECUTION

3.01 GENERAL

A. Field Installation Weather conditions.

1. Perform welding only when the surfaces are clean and completely free of any moisture or mineral deposits. Protect pipe and fittings from salt water spray or deposition or clean and protect pipe and fitting joints prior to welding.
2. Do not weld the pipe during periods of high winds or rain unless the areas being welded are properly shielded.

B. Field welding.

1. Use couplings and prefabrication of pipe systems at the factory to minimize field welding to the greatest extent possible. Pipe butt welds may be performed at the job site, providing the butt welds are performed only with an inert gas shielded process and that the welding requirements of this Section are rigidly adhered to.
2. On the interior and exterior of the pipe, remove all residue, oxide, and heat stain from any type of field weld and the affected areas adjacent by the use of stainless steel wire brushes, followed by cleaning with an agent such as Avesta BlueOne™ 130 or approved equal, followed by complete removal of the agent.

C. Use wooden scaffolding and/or ladders if possible to gain access to work areas. If metal scaffolding and/or ladders must be used, tape or otherwise shield the contact points between scaffolding/ladders and the stainless steel.

- D. After installation, wash and rinse all foreign matter from the piping surface. Adhere to the passivation manufacturer's recommendations and local regulations for safety and disposal of any waste chemicals.

3.02 REPAIR/RESTORATION

- A. Per Section 400501 and as specified herein.
- B. Paint all steel or iron flanges, couplings, and appurtenances in accordance with Section 099000. Painting of the stainless steel pipe is not required.
- C. Restore areas damaged or discolored by field welding or handling, iron contamination or soiled to a uniform surface finish and consistently clean surface with methods specified for shop fabrication.
- D. Identifying spool piece marks shall be removed with paint thinner or solvents and the entire stainless steel surface shall be washed with detergent and hot water and rinsed clean.

3.03 LOW PRESSURE AIR TESTING

- A. The CONTRACTOR shall furnish all labor, testing materials and equipment and shall preform a low-pressure air test on the installed piping.
- B. Test pressure shall be 5 psig. Allow pressure to stabilize for at least five minutes prior to conducting test.
- C. The minimum test time shall be 1.8 minutes per each 100 LF of installed pipe.
- D. Record drop in pressure during test period; when air pressure has dropped more than 1.0 psig during test period, piping has failed. When 1.0 psig air pressure drop has not occurred during test period; piping is acceptable.
- E. Contract shall determine and correct the causes of any air leakage at no additional cost to OWNER.

END OF SECTION

SECTION 6
STANDARD SPECIFICATIONS

STANDARD SPECIFICATIONS

1. The "Construction and Material Specifications" of the State of Ohio Department of Transportation (ODOT), 2023 edition, current ODOT supplemental specifications, and current ODOT standard drawings shall govern work and materials which are not specified or modified herein or on the project Contract Drawings. All references to "the Department" shall be changed to "the Owner or his Representative." The project Contract Drawings and Specifications, in the event of a discrepancy, shall supersede the ODOT Specifications.

The absence of an "As Per Plan" designation on some item descriptions in the proposal for which there are clear and controlling plan notes, specifications, or other requirements does not relieve the Contractor of the responsibility to read, bid and construct those particular items in accordance with the governing plan notes, specifications, or other requirements and the Contractor shall have no basis of claim based upon an "order of precedence".

ODOT 104.02 D., 611.04, 611.12, and 611.13 shall not apply to this project.

SECTION 7
SPECIFIC PROJECT REQUIREMENTS

SPECIFIC PROJECT REQUIREMENTS

1 - CONTACT DURING BIDDING

- 1.1 All questions during bidding should be addressed to Timothy McLaughlin, at Verdantas, LLC, at. (440) 530-2352 Ext. 352

2 – ENVIRONMENTALLY RESPONSIBLE PRACTICES

- 2.1 **In the execution of this contract, the parties agree to adhere to environmentally responsible practices, including the promotion of recycling and waste reduction.** Wherever applicable, materials used in the performance of this contract, the contractor shall recycle, reuse, or source from sustainable origins. The contractor will implement appropriate waste management measures to ensure compliance with local and federal recycling regulations. Additionally, the contractor shall dispose of any materials in an environmentally conscious manner, minimizing landfill contributions and prioritizing recycling initiatives. Failure to adhere to these recycling commitments may result in corrective actions or penalties as outlined in this contract. Please note that all contracts involving asphalt will require “Cold In-Place Recycling.”

3 - GEOTECHNICAL REPORT

- 3.1 A geotechnical report dated by Somat Engineering was relied upon by the Engineer in the preparation of drawings and specifications. Copies of the report are provided along with each bid set but are not considered to be part of the contract documents.

4 - INSURANCE

- 4.1 Section SC-5.04(D) of the Supplementary Conditions shall be deleted and no "all risk builders risk" or "installation floater" insurance need be purchased by the Contractor.
- 4.2 See the following Bid Set Sections for Insurance Requirements:
- A. Section 1, Instructions to Bidders, Part 10 Insurance
 - B. Section 3, General Conditions, Article 5 Bonds and Insurance (EJCDC) or Article 11 Insurance and Bonds (AIA), whichever is used in the Bid Set
 - C. Section 4, Supplemental Conditions

5 - WORKING HOURS

- 5.1 No work shall be performed between the hours of 7:30 p.m. and 7:30 a.m. nor on Saturday, Sunday, or legal Holidays, without written permission of the Owner.

6- PROJECT COMPLETION

- 6.1 All work including restoration and clean-up shall be completed no later than the contract completion date. Failure to complete all work within the allotted time will result in assessment of liquidated damages. Upon completion of all work and written notification of

same by the Contractor, the Engineer and Owner will compile a punch list. The punch list will be sent to the Contractor. All punch list work shall be completed to the satisfaction of the Engineer and the Owner within 14 days after receipt of the punch list. Failure to complete the punch list work within the allotted time will result in assessment of liquidated damages.

7 - GENERAL

- 7.1 The making of this improvement will not require the closing of the roadway to through traffic. Local access to abutting properties shall be maintained at all times. Access to all driveways shall also be maintained at all times excepting the time when concrete pavement and concrete drive aprons are curing.
- 7.2 It shall be the responsibility of the Contractor to maintain safe and satisfactory access, vehicular and pedestrian, to all abutting properties within the project. The Contractor shall furnish, maintain, and subsequently remove all necessary safeguards such as barricades, barriers, temporary pavement, lighting, flagmen, temporary guardrail, detour and construction signing and other traffic controls so as to avoid damage and/or injury and to ensure the safety of vehicles and persons using the roadway during construction both within and outside of the project limits.

Maintenance of traffic shall be governed by the "Ohio Manual of Uniform Traffic Control Devices" for streets and highways, hereinafter referred to as the Manual or the OMUTCD, and as supplemented by the pertinent items of the State of Ohio Department of Transportation Construction and Material Specifications and the following requirements:

All signs, drums, barrels or lane markings for traffic control during construction shall be in place prior to any construction.

The Contractor will be required to provide, erect, maintain (in proper position, clean, legible and in good working condition) and remove all lights, signs, sign supports, barricades, drums and all other traffic control devices necessary for the maintenance of Traffic.

The safety of pedestrian traffic shall be considered at all times. It shall be the Contractor's responsibility to provide lights, signs, barricades and other warnings, to physically separate the pedestrian from hazards incidental to the installation of the required traffic control devices such as anchor bolts, open excavation, etc.

The cost of providing, installing, maintaining and removing all traffic control devices required to maintain traffic during construction including lights, signs, sign supports, drums and barricades and temporary pavement marking shall be included in the unit prices stipulated for the various items of the proposal.

END OF SECTION

SECTION 8
SPECIAL REQUIREMENTS – EPA

Contract Document Provisions

- The following contract requirements and forms are to be included in the construction contract documents. Completed copies of the forms are to be submitted to Ohio EPA within one week after bids are received, or sooner, dependent on your individual project schedule. Bid packages for WPCLF projects should be submitted to DEFA in the central office while bid packages for WSRLA projects should be submitted to the appropriate DDAGW district office.

Equal Employment Opportunity (EEO) Requirements

The Contractor's EEO Certification Form must be (1) included in the contract documents and (2) referenced in the Instructions to Bidders, informing bidders that the form must be completed and submitted with their bid.

NOTE: If the loan applicant has its own EEO requirements, local procedures and forms may be substituted for the EPA form.

Debarment

The Certification Regarding Debarment, Suspension, and Other Responsibility Matters must be (1) included in the contract documents and (2) referenced in the Instructions to Bidders, informing bidders that the form must be completed and submitted with their bid.

Disadvantaged Business Enterprises (DBE) Utilization

The DBE Specification language and instructions to the bidders and Forms 6100-3, 6100-4 and 6100-2 must be (1) included in the contract documents and (2) referenced in the Instructions to Bidders, informing bidders that the forms must be completed and submitted with their bid.

NOTE: If the loan applicant has its own DBE requirements or if other funding programs with potentially competing DBE requirements are participating in the project funding, please contact Ohio EPA – DEFA for specific instructions regarding the DBE requirements.

Davis-Bacon wage rate requirements

The contract documents must include language that requires contractors and subcontractors to pay wages at rates not less than those prevailing on similar projects within the area as determined by the US Secretary of Labor. In addition, the loan recipient will be required to conduct wage interviews and monitor payroll for compliance.

American Iron and Steel

All treatment works projects funded by a WPCLF assistance agreement and all public water system projects funded by a WSRLA assistance agreement are required to comply with American Iron and Steel (AIS) requirements. The acknowledgement form must be included in the contract documents. The acknowledgement form should be signed by the contractor and submitted with the final bid package. It is recommended that the AIS guidance document and questions and answers document be included in the contract documents.

- The following contract requirements are to be included in the construction contract documents but are not required to be submitted to Ohio EPA for contract endorsement.

Violating Facilities Clause

Language prohibiting this use of equipment or services from anyone on the EPA List of Violating Facilities must be included in the contract documents.

Small Businesses in Rural Areas (SBRA)

Language encouraging the participation of small businesses in rural areas should be included in the contract documents.

Prohibition on Telecommunications and Video Surveillance

Restrictions to loan recipients and subrecipients on certain telecommunications and video surveillance services or equipment due to Public Law 115-232.

Insurance Provisions

Section 3.5 of the WPCLF/WSRLA Loan Agreement contains specific requirements regarding insurance for all contractors and all subcontractors for the life of the contract. These insurance requirements must be reflected in the contract documents. Adjust the language as needed to meet the specifics of the construction project while still meeting the provisions of the Loan Agreement.

Materials Testing

In addition to the details included with specific equipment testing in the specifications, there should be an overall statement regarding testing for the project. Adjust the language as needed to meet the specifics of the construction project.

Continuous Treatment Provisions

It is important that construction activities not result in any temporary violations of Drinking Water or NPDES permit requirements (for permitted facilities). Construction activities should interrupt wastewater service to the individual resident as little as possible. For drinking water projects, it is important that construction activities not result in any disruption of service. The example language is intended for construction work occurring at an existing drinking water plant or a WWTP and must be adjusted to meet the specifics of the construction project.

WPCLF/WSRLA Change Order Form

All change orders for the construction project must be executed on the WPCLF/WSRLA change order form. The form must be (1) included in the contract documents and (2) the instructions referenced in the Contract Documents.

- The following contract requirements are provided in Ohio Revised Code (ORC). Some loan applicants have local requirements that supersede ORC provisions for competitive bidding, and these local requirements can be applied instead of ORC, except for those requirements specified in the WPCLF/WSRLA loan agreements.

Bid Guarantee

The requirements for a bid guarantee (which can be a bond or a certified check, cashier's check, or letter of credit) are covered in ORC 153.54.

Payment and Performance Bonds

The requirements for a Payment and Performance Bond are covered in ORC 153.54 and Section 3.4 of the WPCLF/WSRLA Loan Agreements.

Payment Retention

The requirement for payment retainage is provided in ORC 153.12. Details on how the escrow account that holds the retainage are provided in ORC 153.13. Further details on how and when to pay for materials delivered and installed are provided in ORC 153.14.

Completion Time

The contract documents must state the length of the contract time per ORC 153.19. The dates for Initiation of Operation and Project Completion are specified in the WPCLF/WSRLA Loan Agreements and need to coincide with the specified contract time.

- The following are contract provisions to consider but are not required. The language provided for each are samples only and must be adjusted to reflect the specifics of the project and local needs.

Local Protest Procedure

Some statement as to when a valid protest must be filed, in what form it must be filed and who it must be filed with should be included. ORC 153.12 has some default procedures for handling disputes. If the owner wants more control than provided in ORC, a procedure needs to be spelled out in the Contract Documents.

[Basis and Method for Award](#)

The contract documents should include some language that clearly states what the Owner will consider when determining the successful bidder and to provide a clear basis for the Owner when they have a need to reject the low bidder and go with a different bidder.

[Payment Methods](#)

To minimize uncertainty and arguments that can slow down the progress of construction it is useful to provide language stating how and when the Contractor will get paid. In addition to ORC and other local requirements, the involvement of public funding Agencies such as the WPCLF, WSRLA, Ohio Public Works Commission and Community Development Block Grant impact the process and timing for payments.

Contract Documents Review (pre-advertising)

Whenever possible, all the provisions listed above must be included in the contract documents for the project prior to advertisement for bids. Ohio EPA's review for these contract provisions will occur as part of our normal detail plans and specifications review. The bidding documents are to be submitted to Ohio EPA for review regardless of whether a Permit to Install or a Plan Approval is required for the project.

After bidding has started:

In those cases when WPCLF or WSRLA funding is being requested after advertisement for bids has started, add all missing contract provisions, forms, and requirements via addendum.

After bids have been opened but before contracts have been signed:

If the bid advertisement period is over and bids have been opened, but the construction contract have not been signed yet, provide a draft contract change order which would be used to incorporate all missing contract provisions, forms, and requirements into the contract. This should be done in consultation with local legal counsel to address any potential bid protest concerns.

Construction contracts have already been signed:

If the construction contract has already been signed, a contract change order must be executed incorporating all missing contract provisions, forms, and requirements into the contract.

A [Contract Documents Review checklist](#) is provided here to help ensure that all requirements are included and to help expedite Ohio EPA's review of your documents.

Bid Package Submittals (post-advertising)

Certain documents must be submitted to Ohio EPA within one week after bids are received, or sooner dependent on your individual project schedule. Please [look here for a complete list](#) of the required submittals.

NOTE: THE CONTRACT LANGUAGE SAMPLES PROVIDED HEREIN ARE EXAMPLES OF WHAT COULD BE INCLUDED IN ALL CONTRACTS THAT USE WPCLF OR WSRLA FUNDS. OHIO EPA MAKES NO CLAIMS REGARDING THE LEGALITY OF THESE CLAUSES WITH RESPECT TO STATE OR LOCAL LAW. IT IS IMPERATIVE THAT ANY PARTY INSERTING THESE CLAUSES INTO A CONTRACT VERIFY THAT THEY ARE LEGAL AND ENFORCEABLE ACCORDING TO STATE AND LOCAL LAWS, REGULATIONS, AND ORDINANCES.

Disadvantaged Business Enterprises (DBE) Utilization

(Required Contract Provision)

USEPA has a program to encourage the participation of disadvantaged businesses in the construction activities funded by the Clean Water and Drinking Water SRF's. "DBE" is an all-inclusive term that includes Minority Business Enterprises (MBE), Women Business Enterprises (WBE), Small Business Enterprises (SBE), Small Business in Rural Areas (SBRA), HUBZone Small Business, Labor Surplus Area Firms (LSAF), and other entities defined as socially and/or economically disadvantaged. While the WPCLF and WSRLA strongly encourage participation by all disadvantaged groups, specific participation goals are negotiated with USEPA only for Minority Business Enterprises and Women's Business Enterprises.

Goals

As a condition of receiving capitalization grants from U.S. EPA for the Water Pollution Control Loan Fund (WPCLF) and the Water Supply Revolving Loan Account (WSRLA), the Ohio EPA negotiates "fair share" Disadvantaged Business Enterprises (DBE) objectives with U.S. EPA. **The current negotiated goal for construction related activities is 5.4% (the total goal is based on 3.1% of MBEs and 2.3% of WBEs participation).**

DBE Certification

Under the DBE program, qualified DBE's are those that have been certified as an MBE or WBE. Certifications can be obtained from a federal agency such as the Small Business Administration or the Department of Transportation or by an approved State agency. The Unified Certification Program (UCP) administered by the Ohio Department of Transportation (ODOT) can provide the necessary DBE certifications. Information on the UCP can be found at www.ohioucp.org as well as the ODOT website <https://www.transportation.ohio.gov/programs/business-economic-opportunity/dbe>. The Department of Development operates the Encouraging Diversity Growth and Equity Program (EDGE), the other state approved DBE certification program. Information on EDGE can be found at <https://development.ohio.gov/business/minority-business/business-certifications/encouraging-diversity-growth-and-equity-program>.

DBE Qualifications

To qualify for MBE certification, businesses must be 51 percent owned and controlled by a U.S. citizen and Ohio resident belonging to an African American, Native American, Hispanic, or Asian American ethnic group. In addition, the business must be in operation for at least one year prior to submitting an application. For DBE status, a business must be at least 51 percent owned by a socially and economically disadvantaged person who participates in the daily operations of the business. This person must be a woman or of African-American, Hispanic, Native American, Asian American ethnicity.

Program Requirements

To comply with DBE program requirements the WPCLF/WSRLA loan recipient must do the following:

1. Create and maintain a bidder's list (see description below)

2. Include contract conditions applicable to the DBE program in all procurement contracts entered into by the Borrower for all WPCLF and WSRLA projects. These conditions are listed below.
3. Follow, document, and maintain documentation of good faith efforts on the part of prime contractors to ensure that Disadvantaged Business Enterprises (DBEs) have the opportunity to participate in the project.
4. Review the Form 6100-3 and 6100-4 submittals provided by bidders on the project for completeness and obtain any additional information necessary to verify the certification status of all proposed subcontractors.
5. Obtain documentation of the good faith efforts of the prime contractor if the prime contractor does not meet the MBE or WBE goal.
6. Obtain a written confirmation from any prime contractor states that they will not meet the MBE and WBE goals because they will not be entering into any agreements for goods or services with any company, firm, joint venture, or individual.
7. Submit the following to the Ohio EPA/DEFA as part of the bid package upon which the WPCLF/WSRLA loan amount is determined:
 - Form 6100-3 from each subcontractor
 - Form 6100-4 from each prime contractor
 - a copy of the Good Faith Efforts documentation from any prime contractors that will not meet the MBE and WBE goals,
 - if any of the prime contractors will not meet the MBE and WBE goals because they will not be entering into any agreements for goods or services with any company, firm, joint venture, or individual, a copy of the written confirmation from that prime contractor
8. Report MBE/WBE accomplishments on Form 5700-52A annually (within 15 days after October 1st).

NOTE: It is up to the WPCLF/WSRLA loan recipient whether or not to require completion and submission of Forms 6100-3 and 6100-4 from all bidders with the bid proposal or to accept completion and submission from the successful bidder(s) only at some time after bids are received. Regardless of whether the forms are completed and submitted with the bids or at some later time once the successful bidders are identified, completed forms are to be submitted to Ohio EPA with the bid package.

To comply with DBE program requirements all prime contractors must do the following:

1. Follow, document, and maintain documentation of their good faith efforts.
2. Complete and submit **Form 6100-4 DBE Subcontractor Utilization Summary** as part of the bid proposal package to the loan recipient.
3. Have its Disadvantaged Business Enterprise subcontractors complete **Form 6100-3 DBE Subcontractor Proposed Performance Form** and submit those as part of the bid proposal package to the loan recipient.
4. Provide **Form 6100-2 DBE Subcontractor Actual Participation Form** to all of its Disadvantaged Business Enterprise subcontractors for completion at the end of the work.
5. During construction, provide the data necessary so that the loan recipient can report MBE/WBE accomplishments on Form 5700-52A annually (within 15 days after October 1st).

Bidders List

The Borrower must create, maintain, and use a bidders list for purposes of soliciting both MBE/WBEs and non-MBE/WBEs during procurement of construction, equipment, supplies, and services. This list shall include:

1. Entity's name with point of contact;
2. Entity's mailing address, telephone number, and e-mail address;
3. The procurement on which the entity bid or quoted, and when; and
4. Entity's status as an MBE/WBE or non-MBE/WBE.

Borrowers that receive less than \$250,000 or less in any one fiscal year can be exempt from maintaining a Bidders List.

The Bidders List shall be maintained until the project period has expired and the Borrower is no longer receiving EPA funding. The Bidders List must include all firms that bid on the prime contracts, or bid or gave a quote on subcontracts, including both MBE/WBEs and non-MBE/WBEs.

Required Contract Conditions

The DBE Specification language and instructions to the bidders and Forms 6100-2, 6100-3 and 6100-4 must be included in the contract documents and referenced in the Instructions to Bidders, informing bidders that the forms must be completed and submitted with their bid for all WPCLF and WSRLA projects:

1. The prime contractor must pay its subcontractor for satisfactory performance no more than 30 days from the prime contractor's receipt of payment from the owner.
2. The prime contractor must notify the owner in writing prior to the termination of any Disadvantage Business Enterprise subcontractor for convenience by the prime contractor.
3. If a Disadvantage Business Enterprise contractor fails to complete work under the subcontract for any reason, the prime contractor must employ the six Good Faith Efforts (listed below) if soliciting a replacement contractor.
4. The prime contractor must employ the six Good Faith Efforts even if the prime contractor has achieved its fair share objectives.
5. An owner must ensure that each procurement contract it awards contains the following terms and conditions:

The contractor shall not discriminate on the basis of race, color, national origin or sex in the performance of this contract. The contractor shall carry out applicable requirements of 40 CFR Part 33 in the award and administration of contracts awarded under EPA financial assistance agreements. Failure by the contractor to carry out these requirements is a material breach of this contract which may result in the termination of this contract or other legally available remedies.

Good Faith Efforts

Borrowers and their prime contractors must follow, document, and maintain documentation of their good faith efforts as listed below to ensure that Disadvantaged Business Enterprises (DBEs) have the opportunity to participate in the project by increasing DBE awareness of procurement efforts and outreach.

1. Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities; including DBEs on solicitation lists and soliciting them whenever they are potential sources.
2. Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitation for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.
3. Consider in the contracting process whether firms competing for large contracts could be subcontracted with DBEs. This will include dividing total requirements when economically feasible into smaller tasks or quantities to permit participation by DBEs in the competitive process.
4. Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.
5. Use the services and assistance of the Small Business Administration and the Minority Business Development Agency of the U.S. Department of Commerce.
6. If the prime contractor awards subcontracts, require the prime contractor to take the steps in numbers 1 through 5 above.

DBE Forms

Form 6100-3 – Each prime contractor must have its DBE subcontractors complete **Form 6100-3 DBE Subcontractor Proposed Performance Form**. This form gives the DBE subcontractor the opportunity to report the scope and cost of the subcontract and it should be forwarded to the Prime Contractor along with the DBE's quote. Each subcontractor completes one Form 6100-3. The Borrower must submit all Form 6100-3 forms to the Ohio EPA/DEFA as part of the bid package upon which the WPCLF/WSRLA loan amount is determined.

Form 6100-4 – Each prime contractor must complete and submit **Form 6100-4 DBE Subcontractor Utilization Summary** as part of the prime contractor's bid proposal package to the Borrower. This form summarizes the Prime Contractor's intended use of identified DBE(s) and the estimated dollar amount of each subcontract. Only one Form 6100-4 form is required from each Prime Contractor. The Borrower must submit this form to the Ohio EPA/DEFA as part of the bid package upon which the WPCLF/WSRLA loan amount is determined.

Form 6100-2 - The prime contractor must provide **Form 6100-2 DBE Subcontractor Actual Participation Form** to all of its Disadvantaged Business Enterprise subcontractors.

This form gives the DBE subcontractor the opportunity to describe the work the DBE received from the Prime Contractor, how much the DBE was paid and any other concerns the DBE might have. Disadvantaged Business Enterprise subcontractors must send completed Form 6100-2 directly to the Region 5 DBE Coordinator after the work by the subcontractor is done and is NOT submitted with the bid package to Ohio EPA.

Region 5 MBE/WBE Coordinator
USEPA, Acquisition and Assistance Branch
77 West Jackson Boulevard (MC-10J)
Chicago, IL 60604

Reporting During Construction – Form 5700-52A

The purpose of MBE/WBE reporting is to monitor the grant recipient's accomplishments in utilizing MBEs and WBEs; and adherence to the good faith efforts (i.e., outreach to MBEs, WBEs, and other DBEs); and progress in achieving MBE and WBE Goals. During the progress of the construction project, the loan recipient must complete & submit Form 5700-52A annually (**within 15 days after October 1st**). If there were no MBEs or WBEs utilized, or no procurement expenditures of any kind were made during the reporting period, a "negative report" is still required.

Reports are to be sent to:

Florel Fraser, Ohio EPA – DEFA
P.O. Box 1049
Columbus, OH 43216-1049
E-mail address: Florel.Fraser@epa.ohio.gov
Phone: (614) 644-3636

**Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Participation Form**

An EPA Financial Assistance Agreement Recipient must require its prime contractors to provide this form to its DBE subcontractors. This form gives a DBE¹ subcontractor² the opportunity to describe work received and/or report any concerns regarding the EPA-funded project (e.g., in areas such as termination by prime contractor, late payments, etc.). The DBE subcontractor can, as an option, complete and submit this form to the EPA DBE Coordinator at any time during the project period of performance.

Subcontractor Name		Project Name	
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Prime Contractor Name		Issuing/Funding Entity:	

Contract Item Number	Description of Work Received from the Prime Contractor Involving Construction, Services , Equipment or Supplies	Amount Received by Prime Contractor

¹ A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

² Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

Disadvantaged Business Enterprise (DBE) Program DBE Subcontractor Participation Form

Please use the space below to report any concerns regarding the above EPA-funded project:

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

Subcontractor Signature	Print Name
Title	Date

ALERT

“Total Procurement” fields and “MBE/WBE Combined Procurement” fields located in section 4B of this form should include Federal funds provided under the assistance agreement, recipient matching funds, and funds from other sources that are included in the assistance agreement.

Due to process time of Paperwork Reduction Act procedures, EPA is not able to update the [EPA Form 5700-52A](#) immediately to reflect this clarification.

If EPA grant recipients have questions about [EPA Form 5700-52A](#), please work with your respective Grants Specialist or [DBE Coordinator](#).



U.S. ENVIRONMENTAL PROTECTION AGENCY MBE/WBE UTILIZATION UNDER FEDERAL GRANTS AND COOPERATIVE AGREEMENTS

This collection of information is approved by OMB under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. (OMB Control No. 2030-0020). Responses to this collection of information are required to obtain an assistance agreement (40 CFR Part 30, 40 CFR Part 31, and 40 CFR Part 33 for awards made prior to December 26, 2014, and 2 CFR 200, 2 CFR 1500, and 40 CFR Part 33 for awards made after December 26, 2014). An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The public reporting and recordkeeping burden for this collection of information is estimated to be 1 hour per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates and any suggested methods for minimizing respondent burden to the Regulatory Support Division Director, U.S. Environmental Protection Agency (2821T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

1A. REPORTING PERIOD October 1, — September 30,				1B. REPORT TYPE <input type="checkbox"/> Annual <input type="checkbox"/> Final Report (Project completed)	
1C: Revision of a Prior Year Report? <input type="radio"/> No <input type="radio"/> Yes If yes, what reporting period is being revised and briefly describe the changes made. Note: The revised report will replace the associated original report in its entirety.					
2A. RECIPIENT UNIQUE ENTITY IDENTIFIER					
2B. RECIPIENT REPORTING CONTACT Name: Email: Phone:					
3. FEDERAL AWARD IDENTIFICATION NUMBER (FAIN) (For SRF state recipients, please include all numbers for all open assistance agreements being reported on this form.)					
4A. If NO procurements were made this reporting period (by the recipient, sub-recipient(s), loan recipient(s), and prime contractor(s)), CHECK and SKIP to Block No. 6. (Procurements are all expenditures through contract, order, purchase, lease or barter of supplies, equipment, construction, or services needed to complete Federal assistance programs.) <input type="checkbox"/>					
4B. Total Procurements & MBE/WBE Accomplishments This Reporting Period (in dollars)					
	Construction	Non-Construction	Total		
Total Procurement:	\$ _____	\$ _____	\$ _____		
MBE/WBE Combined Procurement:	\$ _____	\$ _____	\$ _____		
5A. Good Faith Efforts: If procurements were made, indicate whether your organization has followed the six Good Faith efforts found in 40 CFR Part 33, Subpart C, 40 CFR 33.501 and 2 CFR 200.321. <input type="checkbox"/> Yes, my organization has implemented and documented each of the six Good Faith Efforts on the procurements made during this reporting period. <input type="checkbox"/> No, my organization has not implemented and documented each of the six Good Faith Efforts on the procurements made during this reporting period.			5B. If procurements were made, but no MBE/WBE procurements are being reported, then check the applicable box(es) for the reason(s) why no MBE/WBE procurements were made. <input type="checkbox"/> No MBE/WBE(s) applied <input type="checkbox"/> No MBE/WBE(s) were qualified <input type="checkbox"/> Other:		
6. NAME OF RECIPIENT'S AUTHORIZED REPRESENTATIVE			TITLE		
7. SIGNATURE OF RECIPIENT'S AUTHORIZED REPRESENTATIVE			DATE		

Instructions:

A. General Instructions:

MBE/WBE utilization is based on 40 CFR Part 33 and 2 CFR Parts 200 and 1500. The reporting requirement reflects the change in the reporting threshold described in Recipient/ Applicant Information Notice-2018-G04 issued by EPA's Office of Grants and Debarment on September 7, 2018 (<https://www.epa.gov/grants/rain-2018-g04>). EPA Form 5700-52A must be completed annually by recipients of financial assistance agreements where the combined total of funds budgeted for procuring supplies, equipment, construction and services exceeds the current Simplified Acquisition Threshold as set by the Federal Acquisition Regulation at 48 CFR Subpart 2.1. This reporting requirement applies to all new and existing awards and voids all previous reporting requirements.

In determining whether the threshold is exceeded for a particular assistance agreement, the analysis must focus on funds budgeted for procurement under the supplies, equipment, construction, services or "other" categories, and include funds budgeted for procurement under sub- awards or loans.

Reporting will also be required in cases where the details of the budgets of sub-awards/loans are not clear at the time of the grant awards and the combined total of the procurement and sub-awards and/or loans exceeds the Simplified Acquisition Threshold.

For example, if the Simplified Acquisition Threshold is \$250,000, then if a recipient has \$300,000 budgeted under procurement, then completion of this report is required.

When reporting is required, all procurement actions are reportable, not just the portion which exceeds the Simplified Acquisition Threshold.

If at the time of award the budgeted funds exceed the Simplified Acquisition Threshold but actual expenditures fall below, a report is still required.

If at the time of award, the combined total of funds budgeted for procurements in any category is less than or equal to the Simplified Acquisition Threshold and is

maintained below the threshold, no DBE report is required to be submitted.

Recipients are required to report 30 days after the end of each federal fiscal year (i.e. October 30th), per the terms and conditions of the financial assistance agreement.

Final reports are due October 30th or 120 days after the end of the project period, whichever comes first.

MBE/WBE program requirements, including reporting, are material terms and conditions of the financial assistance agreement. Failure to comply may lead to termination of the financial assistance agreement which is then reported to the OMB-designated integrity and performance system accessible through SAM (currently FAPIIS) pursuant to 2 CFR 200.339(b).

B. Submission:

Recipients must submit completed forms to the point of contact associated with the awarding office for the applicable assistance agreement.

Information on specific points of contact for EPA's Headquarters and ten Regional Offices is located at:

<https://www.epa.gov/grants/frequently-asked-questions-disadvantaged-business-enterprises>

Questions regarding the completion of this form should be directed to the DBE Coordinator associated with the awarding office for the applicable assistance agreement. A list of the DBE Coordinators for each awarding office can be located here:

<https://www.epa.gov/grants/epa-dbe-program-coordinators>

c. Instructions:

1A. Specify Federal fiscal year this report covers. The Federal fiscal year runs from October 1st through September 30th (**e.g. November 29, 2020 falls within Federal fiscal year 2021**)

1B. Specify report type. Check the annual reporting box if this is an annual report. If it is a final report, check the final report box to indicate if the project is completed.

1C. Indicate if this is a revision to a previous year and provide a brief description of the revision you are making including what reporting period is being revised. The revised report will replace the associated original report in its entirety.

2A. Provide your organization's Unique Entity Identifier. More information about Unique Entity Identifier, including its meaning, can be found in 2 CFR Part 25.

2B. Identify the name and contact information for the person located within the recipient organization that can be contacted if questions arise from this report.

3. Provide the Federal Award Identification Number (FAIN) assigned by EPA. A separate report must be submitted for each Assistance Agreement.

***For SRF recipients:** In box 3 list numbers for ALL OPEN Assistance Agreements being reported on this form.

4A. Self-explanatory. **Note:** Procurement means expenditures under the supplies, equipment, construction, services or "other" categories, and include funds expended for procurement under sub-awards or loans.

4B. Provide the total dollar amount (in dollars) of **ALL** procurements awarded this reporting period by construction, non-construction, and grand total by the recipient, sub-recipients, and SRF loan recipients, **including** MBE/WBE expenditures, not just the portion which exceeds the threshold. For example: Actual dollars for procurement from the procuring office; actual contracts let from the contracts office; actual goods, services, supplies, etc., from other sources including the central purchasing/ procurement centers).

Provide the total dollar amount (in dollars) of MBE/WBE procurements **ONLY** awarded this reporting period by construction, non-construction, and grand total by the recipient, sub-recipients, SRF loan recipients, and prime contractors not just the portion which exceeds the threshold.

***For SRF recipients only:** In 4B, please enter the total annual procurement amount under all of your SRF Assistance Agreements. The figure reported in this section is **not** directly tied to an individual Assistance Agreement identification number. **(SRF state recipients report state procurements in this section)**

5A. Self-explanatory.

5B. If procurements were made during this reporting period, but no procurements with MBE(s) or WBE(s) are being reported, then select the reason why. If "Other" is chosen, please fill in with the reason.

6. Self-explanatory.

7. Self-explanatory.

****This data is requested to comply with provisions mandated by: statute or regulations (40 CFR Part 33 and/or 2 CFR Parts 200 and 1500); OMB Circulars; or added by EPA to ensure sound and effective assistance management. Accurate, complete data are required to obtain funding, while no pledge of confidentiality is provided.**

Material Suppliers

In October 2009, OEPA/DEFA made a clarification to their DBE Policy. If a Contractor subcontracts work and cannot meet the Goals with MBE/WBE Subcontractors, the Goals may be met by supplying equipment from MBE/WBE Suppliers.

Also, Contractors that do not subcontract work do not have to comply with the MBE/WBE requirements although all Contractors are strongly encouraged to break the work into subcontracts whenever feasible.

Violating Facilities Clause

ViolatingFacilities:

The Contractor agrees to comply with all applicable standards, orders or requirements under Section 306 of the Clean Air Act, 42 USC 1857 (h), Section 508 of the Clean Water Act, 33 USC 1368, Executive Order 11738, and EPA regulations, 40 CFR Part 32, which prohibits the use under non-exempt Federal contracts, grants, or loans of facilities included on the EPA List of Violating Facilities.

Requirement For Utilization Of Small Businesses In Rural Areas (SBRA)

This procurement is subject to the EPA policy of encouraging the participation of small businesses in rural areas. It is EPA policy that recipients of EPA financial assistance awards utilize the services of small businesses in rural areas (SBRAs), to the maximum extent practicable. The objective is to assure that such small business entities are afforded the maximum practicable opportunity to participate as subcontractors, suppliers and otherwise in EPA-awarded financial assistance programs. This policy applies to all contracts and subcontracts for supplies, construction, and services under EPA grants or cooperative agreements. Small purchases are also subject to this policy.

This procurement is subject to the EPA policy of encouraging the participation of small business in rural areas (SBRAs).

Local Protest Procedure

Protests

A protest based upon an alleged violation of the procurement requirement may be filed against the OWNER's procurement action by a party with an adversely affected direct financial interest. The protest shall be filed with the Mayor. The OWNER shall determine the protest. The OWNER may request additional information or a hearing in order to resolve the protest.

A protest shall be filed as early as possible during the procurement process, but must be received by the OWNER no later than one week after the basis of the protest is known or should have been known, whichever is earlier. If the protest is mailed, the protester bears the risk of nondelivery within the required time period.

A protest must clearly present the procurement requirement being protested, the facts which support the protest, and any other information necessary to support the protest.

Continuous Treatment Provisions

It is important that construction activities not result in any temporary violations of NPDES permit requirements (for permitted facilities) and construction activities should interrupt wastewater service to the individual resident as little as possible. For drinking water projects, it is important that construction activities not result in any disruption of service. Any disruption of service must be immediately reported to the Ohio EPA, Drinking Water Section of the appropriate district office.

Continuous Treatment (wastewater projects)

Federal regulations prohibit by-passing of any sewage during construction operations. The Contractor will be responsible for providing any required temporary pumping facilities piping, etc., necessary to complete the project without any plant by-passing and continuous treatment must be provided at the same level during construction as existed prior to construction.

Unless otherwise previously or subsequently specified, the Contractor shall procure and pay for all permits, licenses, and approvals necessary for the execution of his Contract.

The Contractor shall comply with all laws, ordinances, rules, orders, and regulations relating to the performance of the work required to complete their Contract.

Continuous Treatment (drinking water projects)

The Contractor will be responsible for obtaining approval from Ohio EPA for use of temporary pumping facilities, piping and other items in order to complete the project without any plant by-passing. Continuous treatment must be provided at the same level during construction as existed prior to construction.

Unless otherwise previously or subsequently specified, the Contractor shall procure and pay for all permits, licenses, and approvals necessary for the execution of his Contract.

The Contractor shall comply with all laws, ordinances, rules, orders, and regulations relating to the performance of the work required to complete their Contract.

WPCLF/WSRLA Payments

This project is funded in whole or in part by funds from the Water Pollution Control Loan Fund (WPCLF) or the Water Supply Revolving Loan Account (WSRLA) as administered by the Ohio EPA-DEFA and the Ohio Water Development Authority (OWDA). The Contractor shall comply with all requirements of these programs. The Owner shall be responsible for the progress payments to the Contractor if the Owner becomes ineligible for further payments due to circumstances which are of no fault of the Contractor. The monthly payments to vendors may be made through the Owner, the OWDA, or both as deemed by the Owner.

The time frame for payment of pay estimates by the Owner and/or Special Funding Agency(s) may be up to 60 calendar days from date of receipt of pay estimate from Engineer to Owner. Ohio EPA/DEFA must approve all change orders before the change order may be submitted for payment on a pay estimate.

State of Ohio
WATER POLLUTION CONTROL LOAN FUND (WPCLF) /
WATER SUPPLY REVOLVING LOAN ACCOUNT (WSRLA)

CONTRACT CHANGE ORDER

RECIPIENT _____ CHANGE ORDER NBR _____
LOAN NUMBER _____ CONTRACT _____
OWDA PROJECT No. _____ DATE _____
Description of Change: _____

The time provided for completion in the contract for the above items is (increased/decreased) by ____ calendar days.

RECOMMENDED BY: _____ DATE: _____
(Engineer)
APPROVED BY: _____ DATE: _____
(Recipient)
ACCEPTED BY: _____ DATE: _____
(Contractor)

(Company)

		OWDA APPROVAL
Original Contract Amt		The above proposal is hereby accepted and I recommend that it be approved and made a part of the contract noted above. The approval does not constitute an increase in the total loan amount, but represents approval for the work.
Previous Changes (+ / --)		
This Change (+ / --)		
Adjusted Contract Amt		
Ohio EPA Acceptance		Chief Engineer
Date		Date

CHANGE ORDER INSTRUCTIONS:

All Change Orders for this work, regardless of costs and whether Water Pollution Control Loan Fund (WPCLF) or Water Supply Revolving Loan Account (WSRLA) funding will be used to finance the changes, must be submitted to Ohio EPA for review.

Changes Requiring Prior Approval

Any change which substantially modifies the Project Facilities as specified in the Ohio EPA approved Facilities Plan and Final Permit to Install or Final Plan Approval (when applicable) or alters the direct or indirect impact of the Project Facilities upon the environment must be incorporated into a Change Order. One copy of the Change Order prior to execution is to be submitted to Ohio EPA for review and prior approval of the acceptability of the change. "Prior to execution" means before the Change Order is signed by the Owner.

Ohio EPA will review the Change Order and inform the Owner of the technical, environmental and operational acceptability of the change, and give the Owner permission to proceed with the proposed work.

All Other Changes

Change Orders not requiring prior approval as described above must be submitted to Ohio EPA within one (1) month of the time at which they are approved by the Owner. All change orders must be submitted electronically to dedicated change order email addresses for WPCLF and WSRLA projects.

Change Order Approval Process

After the Change Order is executed, one (1) copy of the Change Order, including the supporting documentation, is to be sent electronically to Ohio EPA for final review.

The dedicated e-mail address for the electronic submittal of WPCLF Change Orders is EPAWPCLFCO@epa.ohio.gov.

The dedicated e-mail address for the electronic submittal of WSRLA Change Orders is EPAWSRLACO@epa.ohio.gov.

After the Change Order is accepted and eligible costs determined, Ohio EPA will issue a letter informing the Owner and authorizing OWDA to disburse funds from Project Contingency for the work. The OEPA letter will be sent electronically along with a PDF of the WPCLF/WSRLA Change Order form which will be signed by all parties including Ohio EPA and OWDA.

Payments for Change Order Work

The Owner is precluded from submitting to the OWDA payment requests for Eligible Project Costs associated with the Change Orders until such time as the Ohio EPA's approval of the Change Orders has been obtained.



November 3, 2022

BABA Does Not Apply for this Project

MEMORANDUM

SUBJECT: Build America, Buy America Act Implementation Procedures for EPA Office of Water Federal Financial Assistance Programs

FROM: Radhika Fox
Assistant Administrator

A handwritten signature in dark ink, appearing to be "R. Fox", is placed to the right of the "FROM:" line.

TO: EPA Regional Water Division Directors, Regions I – X
EPA Office of Water Office Directors

OVERVIEW

The Biden-Harris Administration recognized the Nation's critical need for infrastructure investment, championing the Bipartisan Infrastructure Law (BIL), which Congress passed on November 15, 2021 (also known as the Infrastructure Investment and Jobs Act (IIJA)). The BIL will provide an unprecedented level of federal investment in water and wastewater infrastructure in communities across America.

In Title IX of the IIJA, Congress passed the Build America, Buy America (BABA) Act, which establishes strong and permanent domestic sourcing requirements across all Federal financial assistance programs for infrastructure. The U.S. Environmental Protection Agency (EPA) Office of Water is honored to help lead the implementation of these provisions and is proud of its near decade of successful implementation of the American Iron and Steel (AIS) provisions for its flagship water infrastructure programs.

This is a transformational opportunity to build a resilient supply chain and manufacturing base for critical products here in the United States that will spur investment in good-paying American manufacturing jobs and businesses. EPA's efforts to implement BABA will help cultivate the domestic manufacturing base for a wide range of products commonly used across the water sector but not currently made domestically. This will take time, and flexibility will be important to ensure that EPA can leverage critical water investments on time and on budget to protect public health and improve water quality.

IMPLEMENTATION

Recognizing the opportunity and need for BABA implementation guidance, the Made in America Office (MIAO) of the Office of Management and Budget (OMB) published [Initial Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure](#) (OMB Guidance M-22-11) on April 18, 2022. The guidance provides government-wide implementation direction for all Federal financial assistance programs for infrastructure. Despite the extensive guidance developed by MIAO, EPA's Office of Water infrastructure investment programs have received many questions that were not addressed in OMB Guidance M-22-11 or that require further clarification for EPA water infrastructure programs. The following questions and answers serve to supplement OMB Guidance M-22-11 with implementation procedures specific to EPA's relevant water infrastructure programs.

Section 70914(a) of the IIJA states when a Buy America preference under BABA applies: "Not later than... [May 14, 2022], the head of each Federal agency shall ensure that none of the funds made available for a Federal financial assistance program for infrastructure...may be obligated for a project unless all of the iron, steel, manufactured products, and construction materials used in the project are produced in the United States." Therefore, Federal financial infrastructure investments obligated on or after May 14, 2022, must comply with the BABA requirements. Absent a waiver, all iron, steel, manufactured products, and construction materials permanently incorporated into an infrastructure project subject to the BABA requirements must be produced in the United States. For many of EPA's Office of Water infrastructure investment programs, the vast majority of products permanently incorporated into construction, maintenance, or repair projects must comply with the BABA requirements, with the exception of select construction materials (cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives), which are specifically excepted by the BABA statute.

EPA's Office of Water implements many infrastructure investment programs subject to BABA requirements, including the following:

- Alaska Native Villages and Rural Communities Water Grant Program (ANV) (and any associated Interagency Agreements with the Indian Health Service)
- Clean Water and Drinking Water State Revolving Fund Programs (CW and DWSRF)
- Clean Water and Drinking Water Grants to U.S. Territories and the District of Columbia
- Clean Water Indian and Drinking Water Tribal Infrastructure Grant Set-aside (and any associated Interagency Agreements with the Indian Health Service)
- Coastal Wetlands Planning, Protection and Restoration Act, (CWPPRA) Programs
- Congressionally Directed Spending/Community Project Funding (also known as Community Grants)
- Geographic Programs¹
- Gulf Hypoxia Program
- National Estuaries Program (CWA Section 320)

¹ Geographic Programs include: Great Lakes Restoration Initiative, Chesapeake Bay, San Francisco Bay, Puget Sound, Long Island Sound, Gulf of Mexico, South Florida, Lake Champlain, Lake Pontchartrain, Southern New England Estuaries, Columbia River Basin, Pacific Northwest

- 319 Nonpoint Source Management Program Implementation
- Reducing Lead in Drinking Water Grant Program (SDWA §1459B)
- Assistance for Small and Disadvantaged Communities Grants: Small, Underserved, and Disadvantaged Community Grant Program (SUDC), Emerging Contaminants in Small or Disadvantaged Communities (EC-SDC) and Drinking Water Infrastructure Resilience & Sustainability (SDWA §1459A)
- Sewer Overflow and Stormwater Reuse Municipal Grants (OSG)
- USMCA Implementing Legislation (Section 821 and Title IX, USMCA Supplemental Appropriations, 2020)
- U.S.-Mexico Border Water Infrastructure Program
- Voluntary School and Child Care Program Lead Testing and Remediation Grant Program (SDWA 1464(d))
- Water Infrastructure Finance and Innovation Act (WIFIA)

The questions and answers in this document apply to the implementation of BABA requirements for the Office of Water infrastructure programs listed above unless superseded by regulation, statute, or other applicable guidance. For many of the programs listed above which did not have domestic preference requirements prior to BABA, additional implementation details are pending or may be developed after the issuance of these procedures. In addition, EPA notes that more direction will be helpful to inform the determination and definition of domestic content in manufactured goods. Supplemental guidance on these and other issues, from either OMB or EPA, may be forthcoming. These implementation procedures may also apply to additional, unlisted EPA programs which may be required to apply BABA subsequent to publication of this memorandum (e.g., future funding programs which have been authorized, but not yet appropriated).

For more information on the BABA requirements, visit the EPA Office of Water’s dedicated website – <https://www.epa.gov/cwsrf/build-america-buy-america-baba> – or contact your funding authority (such as your grants officer, portfolio manager, or state contact). For information on approved waivers, visit <https://www.epa.gov/cwsrf/build-america-buy-america-baba-approved-waivers>. You may also email questions to BABA-OW@epa.gov.

This Implementation Procedures document is organized to provide responses to questions in the following topic areas:

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• Appendix 2: Example Build America, Buy America (BABA) Act Assistance Agreement Language	23

QUESTIONS AND ANSWERS

SECTION 1: GENERAL

- Q1.1: Will EPA provide documentation for BABA for bid solicitations and suggested contract language? Will EPA provide suggested language for Assistance Agreements?
 - A1.1: See Appendix 1, which includes suggested language for construction contracts which addresses the BABA requirements. In addition to the language suggested in Appendix 1, EPA also recommends that assistance recipients prepare contract bid solicitation documents with a statement for the consulting engineers and construction firms as follows: “By signing payment application and recommending payment, Contractor certifies they have reviewed documentation for all products and materials submitted for payment, and the certifications are sufficient to demonstrate compliance with Build America, Buy America Act requirements.” In most cases, the assistance recipient’s representatives assume the responsibility for their clients to conduct due diligence on compliance with applicable domestic preference requirements.

All Federal Financial infrastructure assistance agreements subject to BABA must have a clause requiring compliance with the requirements. See Appendix 2 for example assistance agreement language.
- Q1.2: Would federally-financed infrastructure projects outside of the United States need to comply with the BABA requirements?
 - A1.2: No. According to the OMB Guidance (M-22-11), a “project” is defined as “...any activity related to the construction, alteration, maintenance, or repair of infrastructure in the United States.” Therefore, the BABA requirements are not implicated for infrastructure projects occurring outside of the United States, such as projects funded through the United States-Mexico-Canada Agreement with infrastructure activities occurring in Mexico or Canada (that is, outside the United States).
 -
- Q1.3: If most of the project is BABA compliant, and a small portion is not, can an assistance recipient self-fund (i.e., paying with non-federal dollars) the non-compliant products?
 - A1.3: Any project that is funded in whole or in part with federal assistance must comply with the BABA requirements, unless the requirements are otherwise waived. All iron, steel, manufactured products, and construction materials used in a project must meet the BABA requirements unless waived. Absent a waiver, there is no “small portion” or product that does not need to satisfy the BABA requirements unless the requirements are waived (or specifically excluded as is the case for cement and cementitious materials; aggregates such as stone, sand, or gravel; aggregate binding agents or additives; or non-permanent products). An assistance recipient may request a waiver or inquire as to whether a broad waiver, such as a *de minimis* waiver, might apply.

- Q1.4: How do international trade agreements affect the implementation of the BABA requirements?
 - A1.4: The BABA requirements apply in a manner consistent with United States obligations under international trade agreements. Typically, these obligations only apply to direct procurement by the entities that are signatories to these trade agreements. In general, assistance recipients are not signatories to such agreements, so these trade agreements have no impact on BABA implementation. In the few instances where such an agreement applies to a municipality, that municipality is responsible for determining its applicability and requirements and communicating with the funding authority (such as EPA and/or a state) on the actions taken to comply with BABA.

SECTION 2: PRODUCT COVERAGE

- Q2.1: For products made of iron and steel, what is the difference between predominantly and primarily iron and steel?
 - A2.1: EPA considers the terms “predominantly” and “primarily” to be interchangeable, such that a product is considered predominantly (or primarily) iron and steel if it contains greater than 50 percent iron and steel by material cost.
- Q2.2: What is the definition of construction materials (with examples)?
 - A2.2: From OMB Guidance M-22-11: “construction materials” include an article, material, or supply (other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; aggregate binding agents or additives; or non-permanent products) that is or consists primarily of:
 - non-ferrous metals,
 - plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables), (including optic glass),
 - lumber, and
 - drywall.

For example, a plate of glass would be a construction material under BABA, but a framed window that incorporates the glass into a frame would be a manufactured product. Another common construction material for water infrastructure projects would be polyvinyl chloride (PVC) pipe and fittings. However, if PVC components are incorporated into a more complex product such as instrumentation and control equipment or a water treatment unit, those items would be manufactured products.

- Q2.3: What are manufactured products (with examples)?
 - A2.3: From OMB Guidance M-22-11: “...all manufactured products used in the project are produced in the United States—this means the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of

the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation...”

The manufactured products category would cover the majority of potential water infrastructure products, including complex products made up of a variety of material types and components. For water infrastructure projects, common manufactured products would include, but not be limited to, pumps, motors, blowers, aerators, generators, instrumentation and control systems, gauges, meters, measurement equipment, treatment equipment, dewatering equipment, actuators, and many other mechanical and electrical items.

- Q2.4: Which category will valves fall under for BABA? Will it differ from the American Iron and Steel (AIS) requirements?
 - A2.4: For programs that are subject to BABA and AIS (SRF, WIFIA, and Community Project Funding), projects using valves should classify them as iron and steel products under BABA as long as their material cost is made up of more than 50 percent iron and/or steel. Valves with 50 percent or less iron and/or steel by material cost would be considered manufactured products under the BABA requirements.

In accordance with OMB Guidance M-22-11, an article, material, or supply should be classified into only one of the three categories: iron and steel, manufactured products, or construction materials. Under the AIS requirements, all valves made primarily of iron and steel (that is, those with iron and/or steel material cost greater than 50 percent) must comply with the AIS requirements. For BABA, EPA interprets Section IV of OMB Guidance M-22-11 to mean that iron and steel products are those items that are primarily iron and steel, the same as for the AIS requirements.

- Q2.5: Does EPA have a list of products to be classified as “Iron and Steel” under BABA?
 - A2.5: Although this list is not comprehensive, the following products were classified as AIS products if made primarily (more than 50 percent) of iron and/or steel by materials cost (for programs subject to both AIS and BABA, this list would be equivalent for “iron and steel” items or products under either requirement):

Products likely made “primarily” of iron and steel to be classified as <u>Iron and Steel</u> under BABA		
Lined and Unlined Pipe	Lined and Unlined Fittings	Tanks
Flanges	Pipe Clamps and Restraints	Structural Steel
Valves	Hydrants	Pre-Cast, Iron/Steel Reinforced Concrete (of all types, regardless of iron/steel content percentage)
Manhole Covers and other Municipal Castings	Access Hatches	Ballast Screens
Iron or Steel Benches	Bollards	Cast Bases
Cast Iron Hinged Hatches	Cast Iron Riser Rings	Catch Basin Inlets

Cleanout/Monument Boxes	Construction Covers and Frames	Curb and Corner Guards
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Products likely made “primarily” of iron and steel to be classified as <u>Iron and Steel</u> under BABA		
Curb Boxes	Curb Openings	Curb Stops
Detectable Warning Plates	Downspout Shoes	Drainage Grates
Drainage Grate Frames and Curb Inlets	Inlets	Junction Boxes
Lampposts	Manhole Rings and Frames	Manhole Risers
Meter Boxes	Service Boxes	Steel Hinged Hatches
Steel Riser Rings	Trash Receptacles	Tree Grates
Tree Guards	Trench Grates	Valve Boxes
Valve Box Covers and Risers	Access Ramps	Aeration Pipes and Fittings (separate from aeration/blowers)
Angles	Backflow Preventers/Double Check Valves	Baffle Curtains
Iron or Steel Bar	Bathroom Stalls	Beam Clamps
Cable Hanging Systems	Clarifier Tanks	Coiled Steel
Column Piping	Concrete Reinforcing Bar, Wire, and Fibers	Condensate Sediment Traps
Corrugated Pipe	Couplings	Decking
Digester Covers	Dome Structures	Door Hardware
Doors	Ductwork	Expansion Joints
Expansion Tanks (diaphragm, surge, and hydropneumatics)	Fasteners	Fencing and Fence Tubing
Fire Escapes	Flanged Pipe	Flap Gates
Framing	Gate Valves	Generic Hanging Brackets
Grating	Ground Testing Boxes	Ground Test Wells
Guardrails	HVAC Registers, Diffusers, and Grilles	Joists
Knife Gates	Ladders	Lifting Hooks, J-bar, Connectors within, and Anchors for Concrete
Lockers	Man Baskets and Material Platforms	Manhole Steps
Mud Valves	Municipal Casting Junctions	Non-mechanical (aka stationary) Louvers and Dampers
Overhead Rolling Doors/ Uplifting Doors (manual open, no motor)	Pipe Connectors	Pipe Hangers
Pipe Pilings (any type of steel piling)	Pipe Spool (pipe, flanges, connectors, etc.)	Pipe Supports
Pitless Adaptors	Pre-fab Steel Buildings/Sheds (simple structure, unfurnished)	Pre-stressed Concrete Cylinder Pipe (PCCP)
Railings	Reduced Pressure Zone (RPZ) Valves	Roofing
Service Saddles	Sheet Piling	Sinks (not part of eyewash systems)
Solenoid Valves	Stairs	Static Mixers
Stationary Screens	Surface Drains	Tapping Sleeves
Telescoping Valves	Tipping Buckets	Trusses
Tubing	Valve Stem Extensions	Valve Stems (excluding handwheels and actuators)

Wall Panels	Wall Sleeves/Floor Sleeves	Welding Rods
Well Casing	Well Screens	Wire
Wire Cloth	Wire Rod	Wire Rope and Cables

Q2.6: Does EPA have a list of products that could be made “primarily” of iron and steel but would be classified as “manufactured products” under BABA?

A2.6: Although this list is not comprehensive, the following products would be considered “manufactured products” under the BABA requirements, even if the item might be composed primarily of iron and steel by materials cost (Note: These items are not subject to the AIS requirements.):

Products likely made “primarily” of iron and steel to be classified as <u>Manufactured Products</u> under BABA		
Actuator Superstructures/ Support Structures	Aeration Nozzles and Injectors	Aerators
Analytical Instrumentation	Analyzers (e.g., ozone, oxygen)	Automated Water Fill Stations
Blowers/Aeration Equipment	Boilers, Boiler Systems	Chemical Feed Systems (e.g., polymer, coagulant, treatment chemicals)
Chemical Injection Quills	Chemical Injectors	Clarifier Mechanisms/Arms
Compressors	Controls and Switches	Conveyors
Cranes	Desiccant Air Dryer Tanks	Dewatering Equipment
Dewatering Roll-offs	Disinfection Systems	Drives (e.g., variable frequency drives)
Electric/Pneumatic/Manual Accessories Used to Operate Valves (such as electric valve actuators)	Electrical Cabinetry and Housings (such as electrical boxes/enclosures)	Electrical Conduit
Electrical Junction Boxes	Electronic Door Locks	Elevator Systems (hydraulic, etc.,)
Emergency Life Systems (including eyewash stations, emergency safety showers, fire extinguishers, fire suppression systems including sprinklers /piping/valves, first aid, etc.)	Exhaust Fans	Fall Protection Anchor Points
Fiberglass Tank w/Appurtenances	Filters (and appurtenances, including underdrains, backwash systems)	Flocculators
Fluidized Bed Incinerators	Galvanized Anodes/Cathodic Protection	Gear Reducers
Generators	Geothermal Systems	Grinders
Heat Exchangers	HVAC (excluding ductwork)	HVAC Dampers (if appurtenances to aerators/blowers)
HVAC Louvers (mechanical)	Intake and Exhaust Grates (if appurtenances to aerators/blowers)	Instrumentation
Laboratory Equipment	Ladder Fall Prevention Systems	Ladder Safety Posts
Lighting Fixtures	Lightning and Grounding Rods	Mechanical or Actuated Louvers/Dampers
Membrane Bioreactor Systems	Membrane Filtration Systems	Metal Office Furniture (fixed)

Meters (including flow, wholesale, water, and service connection)	Motorized Doors (unit)	Motorized Mixers
Motorized Screens (such as traveling screens)	Motors	Pelton Wheels
Pipeline Flash Reactors (similar to injectors)	Plate Settlers	Precast Concrete without Iron/Steel Reinforcement

Products likely made “primarily” of iron and steel to be classified as <u>Manufactured Products</u> under BABA		
Furnished Pre-fab Buildings (such as furnished with pumps, mechanics inside)	Presses (including belt presses)	Pressure Gauges
Pump Cans/Barrels and Strainers	Pumps	Mechanical Rakes
Safety Climb Cable	Sampling Stations (unless also act as hydrant)	Scrubbers
Sensors	Sequencing Batch Reactors (SBR)	Steel Shelving (fixed)
Slide and Sluice Gates	Spray Header Units	Steel Cabinets (fixed interior/furniture)
Supervisory Control and Data Acquisition (SCADA) Systems	Tracer Wire	Valve Manual Gears, Actuators, Handles
Voltage Transformer	Water Electrostatic Precipitators (WESP)	Water Heaters
Weir Gates		

- Q2.7: Is asphalt paving a covered product under BABA?
 - A2.7: No. EPA interprets Section 70917(c) of the IIJA to exclude asphalt from BABA requirements. Asphalt paving is a type of concrete composed of an aggregate material mixed with a binder (bitumen). EPA considers asphalt concrete to be excluded by section 70917(c) due to its similarities with cement and cementitious materials.

SECTION 3: CO-FUNDING

- Q3.1: If projects are co-funded with funding mechanisms that don’t require BABA, must the entire project comply with BABA?
 - A3.1: Yes. Any project that is funded in whole or in part with federal assistance must comply with the BABA requirements, unless the requirements are otherwise waived. A “project” consists of all construction necessary to complete the building or work regardless of the number of contracts or assistance agreements involved so long as all the contracts and assistance agreements awarded are closely related in purpose, time, and place. This precludes the intentional splitting of projects into separate and smaller contracts or assistance agreements to avoid BABA’s applicability on some portions of a larger project, particularly where the activities are integrally and proximately related to the whole. However, there are many situations in which major construction activities are clearly undertaken in separate phases that are distinct in purpose, time, or place, in which case, separate contracts or assistance agreements would carry separate requirements.

- Q3.2: How will project requirements be determined for co-funded projects subject to potentially different general applicability/programmatic waiver conditions (such as different adjustment period waivers)?
 - A3.2: OMB Guidance M-22-11 addresses cases with project co-funding from separate programs. EPA would apply the guidance’s “cognizant” program determination to projects that are co-funded with different general applicability/programmatic waivers. For instance, if a project were co-funded between WIFIA and SRF and the majority of the Federal funding for the project is from WIFIA, then WIFIA would be the “cognizant” program for application and determination of waivers. In that case, any conditions from an applicable WIFIA waiver would apply.

SECTION 4: WAIVERS

- Q4.1: Who may apply for a waiver and how do you apply?
 - A4.1: Assistance recipients and their authorized representatives may apply for a project-specific waiver. EPA does not accept waiver requests from suppliers, distributors, or manufacturers unless the assistance recipient endorses and submits the request on its own behalf to the funding authority. In the case where multiple programs are providing federal funds to the project, the assistance recipient should submit the waiver request to the cognizant program, the one providing the greatest amount of federal funds for the project. For information on applying for cost waivers, see questions 4.4 and 4.5. For information on the SRF program roles and responsibilities, see question 7.6.

Project-specific waiver requests should generally include: (1) a brief summary of the project, (2) a description and explanation of the need for the waiver for the product(s) in question, (3) a brief summary of the due diligence conducted in search of domestic alternatives (which could include correspondence between assistance recipient and supplier/distributors), (4) the quantity and materials of the product(s) in question, (5) all engineering specifications and project design considerations relevant to the product(s) in question, (6) the approximate unit cost of items (both foreign and domestic) in addition to an estimated cost of the materials and overall project, (7) the date any products will be needed on site in order to avoid significant project schedule disruptions, and (8) any other pertinent information relevant to EPA’s consideration of the waiver (e.g., if relevant for SRF projects: whether the project is designated as an equivalency project, the date the plans and specifications were submitted to the state, the date of construction initiation, expected date of project completion, any special considerations such as local zoning and building ordinances, seismic requirements, or noise or odor control requirements).

In the case of indirect federal assistance, such as the SRF programs, the state authority reviews and conveys the waiver request to EPA. States should submit waiver requests to the appropriate program waiver request inbox. For SRF projects, please use CWSRFWaiver@epa.gov or DWSRFWaiver@epa.gov.

- Q4.2: Can an assistance recipient request a waiver based on a specification written for a specific brand or model of product (that is, a specification that names a branded item or model)?
 - A4.2: In most cases, performance-based specifications are expected and required for the majority of infrastructure projects funded by EPA's financial assistance programs. In rare cases where "branded" or product-specific sourcing may be included in project specifications, it is suggested that the specifications include the item in question (that is, not simply a catalog page, but also materials of construction, sizing, quantities, and applicable engineering performance design characteristics for the project, etc.) in addition to the standard phrase "or equal." For the purposes of product alternative market research, EPA will evaluate the BABA requirements based on performance-based engineering specifications for the product(s) in question. If the project's specifications do not include performance-based specifications, or at least an "or equal" designation, EPA will base its research on an "or equal" designation using best professional judgment to the extent practicable.
- Q4.3: If a manufactured product is not readily available domestically, will EPA provide short-term "limited availability" product waivers?
 - A4.3: EPA will address the unavailability of domestic products through the waiver process, including potential national short-term waivers for specific products, if appropriate. To the extent practicable and with the intent to maximize domestic market and supply chain development, EPA intends to address issues of broad product unavailability with targeted, time-limited, and conditional waivers, as prescribed in OMB Guidance M-22-11. EPA will follow its robust and thorough product research processes (those put into place for the AIS requirements for the SRF and WIFIA programs and expanded for the new BABA requirements) to identify and determine those products for which proposed national/general applicability waivers may be appropriate.
- Q4.4: What information is needed when applying for a cost waiver under BABA?
 - A4.4: As part of the cost waiver request, the assistance recipient must demonstrate that implementation of the BABA requirements will increase the overall project cost more than 25 percent. Depending on the circumstances of the overall project cost increases, documentation to justify the cost waiver can vary but may include itemized cost estimates or bid tabulations comparing project costs with and without BABA implementation. Assistance recipients should begin assessing the potential cost impacts of the BABA requirements during the design phase of a project.
- Q4.5: Can administrative costs associated with tracking and verification of certifications be considered when determining if the cost of a project increases by 25 percent or more?
 - A4.5: Yes. Section 70914(b)(3) of the IIJA states that a waiver may be provided if the overall

cost of the project increases by more than 25 percent due to the “inclusion of iron, steel, manufactured products, or construction materials produced in the United States.” EPA interprets this to mean that the “inclusion” of the BABA-covered products could encompass reasonable administrative costs associated with complying with the BABA requirements, such as staff, contractor, and technological resources to collect and track BABA compliance documentation.

- Q4.6: How can assistance recipients and construction contractors address product delivery delays?
 - A4.6: Assistance recipients should reasonably plan for material procurement to account for known potential supply chain issues or extended lead times and shall notify the funding authority well in advance of the issues so that prompt attention can be given to explore options. Where extended lead times for compliant products are impacting project schedules and may significantly impact construction progress, timely communication with the funding agency is important. For products that are unavailable within a reasonable timeframe to meet the objectives and schedule of a project, EPA may consider a non-availability waiver with adequate justification. An assistance recipient would need to apply for the waiver and contact its funding authority (such as EPA and/or a state) to initiate the waiver process.

SECTION 5: DOCUMENTING COMPLIANCE

- Q5.1: Who will be responsible for BABA enforcement?
 - A5.1: Responsibility for BABA implementation applies at all levels, from manufacturers to suppliers and distributors, construction contractors, assistance recipients, and funding authorities.

The manufacturers have responsibility to provide adequate and accurate documentation of the products manufactured. If suppliers and distributors are involved, they are responsible for passing along compliance documentation for products supplied to projects that are subject to the BABA requirements.

The assistance recipient and their representatives are primarily responsible for ensuring the documentation collected for products used on the project is sufficient to document compliance with the BABA requirements.

The funding authority is responsible for providing oversight and guidance as needed to ensure the proper implementation of the requirements. The Uniform Grants Guidance (UGG) (Title 2 of the Code of Federal Regulations (CFR) Part 200) applies to many Federal financial assistance agreements that will include BABA requirements. The general provisions of 2 CFR Part 200 determine the responsible party for the grant funding authority.

For information on SRF program roles and responsibilities, see question 7.6. At all levels, where fraud, waste, abuse, or any violation of the law is suspected, the Office of Inspector General (OIG) should be contacted immediately. The OIG can be reached at 1-888- 546-8740

or OIG_Hotline@epa.gov. More information can be found at this website:
<http://www.epa.gov/oig/hotline.htm>.

- Q5.2: When will the BABA requirements be assessed for compliance? Do assistance recipients need to have waivers for potential non-domestic products before assistance agreements are in place, at the time products are procured or products are incorporated into the project (i.e., used)?
 - A5.2: Compliance is assessed where the domestic product is used (or installed) at the project site. Proper compliance documentation, whether it is a BABA certification letter or a waiver, should accompany a product prior to its “use”, in accordance with Section 70914(a) of IIJA. This may occur prior to assistance agreements being in place but is not necessary. Additionally, communication of BABA requirements through appropriate Terms and Conditions in financial assistance agreements and in project solicitation and contract documents is key in ensuring all parties involved are informed of the requirements for the project before construction is underway.
- Q5.3: How can product compliance with the BABA requirements be demonstrated?
 - A5.3: Assistance recipients and their representatives should ensure that the products delivered to the construction site are accompanied by proper documentation that demonstrate compliance with the law and be made available to the funding authority upon request. The documentation may be received and maintained in hard copy, electronically, or could be embedded in construction management software. The use of a signed certification letter for the project is the most direct and effective form of compliance documentation for ensuring products used on site are BABA-compliant prior to their installation; however, other forms of documentation are also acceptable as long as collectively, the following can be demonstrated:
 - (1) Documentation linked to the project. For example, this can be in the form of the project name, project location, contract number, or project number.
 - (2) Documentation linked to the product used on the project. For example, description of product(s) (simple explanation sufficient to identify the product(s)), or an attached (or electronic link to) purchase order, invoice, or bill of lading.
 - (3) Documentation includes statement attesting that the products supplied to the assistance recipient are compliant with BABA requirement. Reference to the Infrastructure Investment and Jobs Act (“IIJA”) or the Bipartisan Infrastructure Law (BIL) are also acceptable. For iron and steel items under BABA, references to the American Iron and Steel (AIS) requirements are also acceptable and reciprocal with BABA for such items.
 - (4) Documentation that manufacturing occurred in the United States, which could include, for example, the location(s) of manufacturing for each manufacturing step that is being certified. It is acceptable for manufactured products to note a single point of manufacturing, documenting that the final point of manufacturing is in the United States. Note that each BABA category may require different determinations for

compliance.

- (5) Signature of company representative (on company letterhead and signature can be electronic). The signatory of the certifying statement affirms their knowledge of the manufacturing processes for the referenced product(s) and attests that the product meets the BABA requirements.

In addition to compliance documentation, assistance recipients or their representatives should also conduct a visual inspection of the product when it arrives to the project site, especially for iron and steel products which are often stamped with the country of origin. (Note: A country of origin stamp alone is not sufficient verification of compliance with BABA and assistance receipts should not rely on it to ensure compliance.)

EPA may develop alternative procedures for demonstrating compliance. Additional project- or program-specific instructions may be developed on a case-by-case basis in order to meet individual circumstances.

- Q5.4: Will EPA provide a form or template for tracking and documenting compliance?
- A5.4: EPA does not require a specified format for tracking or documenting compliance. Assistance recipients are free to develop any system (from simple to complex software) for tracking items used on the project and the accompanying compliance documentation, e.g., certification letters, applicable waivers, if it helps with implementation and compliance. Elements that may help with keeping track of compliance may include: product description, quantity required/used, product category (i.e., iron and steel, manufactured product, or construction material), status of obtaining certification letter, product cost, and whether the item might qualify as *de minimis*, or qualify under another applicable waiver.
- Q5.5: If a manufacturer claims to comply with the Buy American Act, does it also comply with BABA?
 - A5.5: No. With the exception of the AIS requirements – which EPA interprets to be equivalent to the “iron and steel” requirements under BABA – EPA does not have an interpretation about the comparability of other domestic preference requirements relative to BABA. Any products that are to be certified as compliant with BABA should include a specific reference to the BABA requirements and appropriate attestation from a responsible manufacturing company official. See Question 5.3 for EPA’s recommendations for BABA certification letters.
- Q5.6: How will assistance recipients manage certification letters for hundreds, possibly thousands of products?

A5.6: EPA recognizes that the new BABA requirements will cover most products used in typical water and wastewater infrastructure projects, and that the number of items which may require certification at large and/or complex projects may reach several hundred. EPA is concerned about the potential administrative burden that this would place on assistance recipients. EPA recommends that projects with a high number of potentially covered

products meet with their funding authority about potential compliance strategies to minimize burden and streamline compliance activity. Assistance recipients should prepare contract bid solicitation documents with a statement for the consulting engineers and construction firms as follows: “By signing payment application and recommending payment, Contractor certifies they have reviewed documentation for all products and materials submitted for payment, and the documentation is sufficient to demonstrate compliance with Build America, Buy America Act requirements.” In most cases, the assistance recipient’s representatives may assume the responsibility for their clients to conduct due diligence on compliance with applicable domestic preference requirements.

- Q5.7: Who is responsible for documenting the 55 percent content requirement for manufactured products under BABA? What if the final manufacturer cannot trace or verify domestic origin for all components?
 - A5.7: The manufacturer who signs a certification letter is responsible for documenting compliance with any of the three categories of products (iron and steel, manufactured products, or construction materials). For manufactured products, BABA requires that greater than 55 percent of the total cost of all components of the manufactured product be from domestic sources. EPA recommends that the certification letter for manufactured products document whether the item passes the content test in the final product along with a statement attesting to compliance with the BABA requirements for manufactured products.
- Q5.8: How do final product fabricators document compliance when the final step of manufacturing may be simply assembling components?
 - A5.8: It is acceptable, in many cases, especially for highly complex manufactured products that utilize many sub-components, for the final point of assembly to certify without using a “step certification” process. Multiple certifications (i.e., step certifications) or a singular certification can be used for a product, as long as the certifying official is willing to attest to the product’s compliance with BABA requirements at all stages of manufacturing.
- Q5.9: Will Material Test Reports be acceptable in lieu of a BABA certification for iron and steel?
 - A5.9: Material Test Reports (MTRs, commonly referred to as “Mill Certifications” or “Mill Certs”) provide the chemical composition of steel and iron from a mill or foundry. If an MTR accompanies the delivery of steel or iron to a project site with an invoice or bill of lading, EPA will consider it sufficient to demonstrate compliance (equivalent to a certification letter) as long as the MTR includes a manufacturer representative’s signature in addition to the location (city and state) of the mill/foundry. It is common for MTRs to be the first letter in a “step certification” if the product is further fabricated or painted, etc., by another manufacturer.
- Q5.10: Can a manufacturer use a fillable certification letter for products?

- A5.10: EPA recommends that certifications be signed by representatives of the manufacturing entity. EPA does not oppose manufacturers using forms to internally develop letters within their company, thereby providing signed, non-manipulable certification letters to suppliers, distributors, and/or assistance recipients. A fillable form that can be changed by someone outside of the manufacturer after signature does not demonstrate compliance and may create compliance concerns for the manufacturer or assistance recipient.
- Q5.11: Are product certifications from suppliers and distributors allowed?
 - A5.11: EPA recommends that representatives of product manufacturers certify compliance and discourages suppliers and distributors from creating certification letters. EPA does not rule out the possibility that a third-party certification process, such as a certification by a distributor, may be viable. However, EPA is currently not aware of a system or proposed system that meets the EPA's recommendations for documentation of product certification.
- Q5.12: How long should assistance recipients keep compliance documentation?
 - A5.12: Assistance recipients should apply recordkeeping requirements for the project according to the procedures dictated by the funding authority. For most EPA grant programs, this is prescribed in the UGG at 2 CFR 200.334-200.338; e.g., the SRF programs require a minimum of three years. Other funding programs may require longer documentation retention periods.

SECTION 6: PROGRAMS WITH AMERICAN IRON AND STEEL REQUIREMENTS

- Q6.1: Does BABA supersede the American Iron and Steel (AIS) Requirements?
 - A6.1: The BABA requirements for items considered "iron and steel" are equivalent to those for covered iron and steel products under the AIS requirements in the Clean Water Act and the Safe Drinking Water Act. These requirements apply to the CWSRF, DWSRF, WIFIA, and Water infrastructure Community Grants. BABA includes a "Savings Provision" (Section 70917(b)) that states that BABA does not affect existing domestic content procurement preferences for infrastructure projects funded by Federal financial assistance programs that meet the requirements of section 70914. EPA views the AIS requirements as meeting the "iron and steel" product requirements of BABA Section 70914, as they both include the key requirement that items made of iron and steel be wholly manufactured in the United States from the point of melting and/or pouring the iron or steel components through final manufacturing step. Because of the "Savings Provision" of Section 70917, the AIS requirements satisfy the "iron and steel" requirements of BABA. For the programs that have AIS requirements, EPA intends to implement BABA requirements the same way for iron and steel items as it has done for AIS products.

- Q6.2: For iron and steel products, does a manufacturer need to demonstrate compliance from initial melting through the finished product?
 - A6.2: For iron and steel products, the BABA requirements are the same as the existing AIS requirements, in that all of the iron and steel in a covered product (that is, the product is comprised of more than 50 percent iron and steel by material cost) must be melted and poured in the United States and all subsequent manufacturing processes (such as grinding, rolling, bending, reheating, and casting) must occur in the United States.

Q6.3: Will EPA apply the same manufacturing standards for BABA iron and steel products as for the American Iron and Steel (AIS) requirements?

- A6.3: Yes. For AIS, EPA did not require raw materials used in the production of steel or iron to be domestically sourced. For BABA, EPA interprets the requirements to be the same. Hence, like AIS, raw materials in the production of iron and steel subject to BABA requirements would not need to be domestically sourced. The key step for both AIS and BABA domestic iron and/or steel production is the melting/pouring (that is, the location of the furnace), which must be in the United States.
- Q6.4: Will the certification process be similar to the process established for the American Iron and Steel requirements?
 - A6.4: EPA expects the certification process for the BABA requirements to be very similar to that established for the AIS requirements. For iron and steel products, the process should remain the same for AIS and BABA. EPA recommends for manufactured products and for construction materials that certification letters include direct reference to the product/material content requirements under BABA, in addition to an affirmative statement verifying that the product meets the BABA requirements.
- Q6.5: Will duplicate certification letters be required for AIS and BABA for iron/steel products?
 - A6.5: No. Compliance with BABA requirements will be sufficient to demonstrate compliance with AIS requirements for iron and steel products. If a project is subject to BABA, the only demonstration of compliance necessary is with the BABA requirements, of which the iron and steel requirements are equivalent to those of the AIS statutory requirements: the iron or steel in a product made primarily or predominantly of iron and steel (comprising more than 50 percent iron and steel by material cost) must be melted and/or poured in the United States and all subsequent manufacturing processes must occur in the United States.

SECTION 7: PROGRAM-SPECIFIC ISSUES

- Q7.1.: How do the BABA requirements apply to Community Grants?
 - A7.1: The Community Project Funding/Congressionally Directed Spending grants for the construction of drinking water, wastewater, and stormwater infrastructure and for water

quality protection are subject to the requirements specified in the explanatory statement accompanying the Consolidated Appropriations Act (Explanatory Statement for Division G of P.L. 117-13, the Consolidated Appropriations Act of 2022). The explanatory statement asserts: “Applicable Federal requirements that would apply to a Clean Water State Revolving Fund or Drinking Water State Revolving Fund project grant recipient shall apply to a grantee receiving a CPF grant under this section.” Therefore, the federally funded Community Project Funding/Congressionally Directed Spending grants are subject to the same requirements that apply to CWSRF or DWSRF projects, including BABA and AIS requirements. See also A1.2.

- Q7.2: Should SRF projects covered by the BABA SRF Projects Design Planning Adjustment Period Waiver follow the same procedures for demonstrating compliance as outlined for American Iron and Steel requirements?
 - A7.2: Yes. The SRF Design Planning Adjustment Period waiver does not waive the iron and steel requirements under BABA. The SRF programs have existing domestic preference requirements for SRF projects under CWA Section 608 and SDWA Section 1452(a)(4) (AIS requirements) to use iron and steel products that are produced in the United States. Sections 70917(a) and (b) of BIL explain the application of BABA to existing domestic preference requirements. Specifically, the savings provision in Section 70917(b) states that existing domestic preference requirements that meet BABA requirements are not affected by BABA. The statutory AIS requirements were existing at the time BABA became law and satisfy the BABA iron and steel requirements. Therefore, the statutory AIS requirements that have previously applied to SRF-funded projects will continue to do so, and compliance with AIS requirements will satisfy the BABA iron and steel requirements. Demonstration of compliance for iron and steel products will follow the AIS implementation policies for projects subject to the waiver.
- Q7.3: For SRF programs, is BABA considered a federal cross-cutting authority? (i.e., do “equivalency” rules apply?)
 - A7.3: Yes, BABA is considered a federal cross-cutting requirement that applies to SRF assistance equivalent to the federal capitalization grant (i.e., “equivalency” projects). EPA’s SRF regulations at 40 CFR 35.3145 and 35.3575 require states and recipients of SRF funds equivalent to the amount of the federal capitalization grant to comply with federal cross-cutting requirements. Section 70914 of the IIJA, which states when a Buy America preference applies, explains that “none of the funds made available for a Federal financial assistance program for infrastructure...may be obligated for a project unless all of the iron, steel, manufactured products, and construction materials used in the project are produced in the United States.” Therefore, BABA only applies to projects funded in an amount equivalent to the federal capitalization grant and not to those projects receiving funds in excess of the capitalization grant (i.e., “non-equivalency” projects). (Note: The AIS requirements continue to apply for all SRF projects, including non-equivalency projects, and all WIFIA and Community Grant projects, because equivalency does not apply.)

- Q7.4: Do the BABA requirements apply to Drinking Water State Revolving Fund set-asides?
 - A7.4: Due to requirements related to the deposit of funds in the DWSRF program, almost all of the funds used to conduct set-aside activities are Federal dollars. Therefore, Federal cross-cutting requirements must be applied to all set-aside activities. However, in the case of most set-aside activities, the cross-cutting requirements will not be implicated because of the nature of the activities conducted under the set-asides. Because the BABA requirements only apply to infrastructure, and infrastructure typically is not an eligible set-aside expenditure (with one potential exception being loans for incentive-based source water protection measures under the Local Assistance and Other State Programs Set-Aside), the BABA requirements will not apply to most set-aside activities.
- Q7.5: What if an SRF project is refinanced using Federal financial assistance on or after May 14, 2022?
 - A7.5: If an SRF project began construction, financed from another funding source, prior to May 14, 2022, but is refinanced through an assistance agreement executed on or after that date, BABA requirements will apply to all construction that occurs on or after May 14, 2022, through completion of construction, unless a waiver applies. There is no retroactive application of the BABA requirements where a refinancing occurs for an SRF project that has completed construction prior to May 14, 2022. (Note: If SRF funding is used for the refinancing, the AIS requirements may still apply depending on the timing of construction.)
- Q7.6: What are the roles and responsibilities for SRF programs for BABA implementation?
 - A7.6: Implementation of the BABA requirements for the State Revolving Fund programs will continue the roles and responsibilities from the successful AIS implementation process.

As with AIS, it is both the assistance recipient's and the state's responsibility to ensure compliance with the BABA requirements. The state is the recipient of a federal capitalization grant and must comply with all grant conditions, including a condition requiring adherence to BABA requirements.

Consequently, states are strongly advised to conduct site visits of projects during construction and review documentation demonstrating the assistance recipient's proof of compliance. In EPA's experience, most states conduct periodic site visits and arrange timely meetings with funded projects. Observed best practices typically include a meeting early in the process (sometimes before bid and usually prior to commencing construction) and at least one project site visit during the construction process. Assistance recipients must maintain documentation of compliance with the BABA requirements, as explained in question 5.3. The documents must be kept by the assistance recipient and should be reviewed by the state during project reviews.

The state's role in the waiver process is to review any waiver requests submitted to the state to ensure that all necessary information has been provided by the assistance recipient prior to forwarding the request to EPA. If a state finds the request lacking, the state should work with

the assistance recipient to help obtain complete information. Question 4.1 explains the information needed by EPA to expediently review a waiver request.

In order to implement the BABA requirements, EPA has developed an approach for effective and efficient implementation of the waiver process to allow projects to proceed in a timely manner. The framework described below will allow states, on behalf of the assistance recipients, to apply for waivers of the BABA requirements directly to EPA Headquarters. Only waiver requests received and/or endorsed from states will be considered. Pursuant to BABA, EPA has the responsibility to make findings as to the issuance of waivers to the BABA requirements.

Step-by-step SRF Waiver Process

The waiver process begins with the assistance recipient. To fulfill the BABA requirements, the assistance recipient must in good faith design the project (where applicable) and solicit bids for construction with American-made iron and steel, manufactured goods, and construction materials. It is essential that the assistance recipient include the BABA terms in any request for proposals or solicitations for bids, and in all contracts (see Appendix 2 for sample construction contract language). The assistance recipient may receive a waiver at any point before, during, or after the bid process, if one or more of three statutory conditions is demonstrated to EPA and approved.

To apply for a project-specific waiver, the assistance recipient should email the request in the form of a Word document (.doc) or editable PDF (.pdf) to the funding program. It is strongly recommended that each state identify a person or persons for BABA communications. The state designee(s) will review the application for the waiver and determine whether the necessary information has been included (Note: More information may be provided in the future regarding what information is required to be included in waiver requests). Once the waiver application is complete, the designee (State) will forward the application to the EPA for review.

Evaluation by EPA

After receiving an application for waiver of the BABA requirements and ensuring sufficient information was provided, EPA will publish the request on its website for 15 days and receive public comment. EPA will then determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver.

In the event that EPA finds that adequate documentation and justification has been submitted, the Administrator may grant a waiver to the assistance recipient. EPA will notify the state designee whether a waiver request has been approved or not approved as soon as such a decision has been made. Granting such a waiver is a four-step process:

1. Research – After receiving an application for a waiver, EPA will perform market research to determine whether the iron, steel, manufactured goods, or construction materials are available domestically.
2. Posting – After research, if no domestic product has been identified, EPA is required to

publish the application and all material submitted with the application on EPA's website for 15 days. During that period, the public will have the opportunity to review the request and provide informal comment to EPA. The website can be found at:
<https://www.epa.gov/cwsrf/build-america-buy-america-baba-waivers-open-public-comment>.

3. Evaluation – After receiving an application for waiver of the BABA requirements, EPA will determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver to determine whether or not to grant the waiver.

4. Signature of waiver approval by the Administrator or another agency official with delegated authority – As soon as the waiver is signed and dated, EPA will notify the State SRF program and post the signed waiver on the Agency's website. The assistance recipient should keep a copy of the signed waiver in its project files.

(Note: Additional steps may be required in the future regarding the waiver process depending on additional guidance from OBM) APPENDIX 1



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR 20 2014

OFFICE OF WATER

MEMORANDUM

SUBJECT: Implementation of American Iron and Steel provisions of P.L. 113-76,
Consolidated Appropriations Act, 2014

FROM: f (Andrew D. Sawyers, Director C.
v) Office of Wastewater Management (4201M)

Peter C. Grevatt, Director
Office of Ground Water and Drinking Water (4601M)

TO: Water Management Division Directors
Regions I - X

P.L. 113-76, Consolidated Appropriations Act, 2014 (Act), includes an "American Iron and Steel (AIS)" requirement in section 436 that requires Clean Water State Revolving Loan Fund (CWSRF) and Drinking Water State Revolving Loan Fund (DWSRF) assistance recipients to use iron and steel products that are produced in the United States for projects for the construction, alteration, maintenance, or repair of a public water system or treatment works if the project is funded through an assistance agreement executed beginning January 17, 2014 (enactment of the Act), through the end of Federal Fiscal Year 2014.

Section 436 also sets forth certain circumstances under which EPA may waive the AIS requirement. Furthermore, the Act specifically exempts projects where engineering plans and specifications were approved by a State agency prior to January 17, 2014.

The approach described below explains how EPA will implement the AIS requirement. The first section is in the form of questions and answers that address the types of projects that must comply with the AIS requirement, the types of products covered by the AIS requirement, and compliance. The second section is a step-by-step process for requesting waivers and the circumstances under which waivers may be granted.

Implementation

The Act states:

Sec. 436. (a)(1) None of the funds made available by a State water pollution control revolving fund as authorized by title VI of the Federal Water Pollution Control Act (33 U.S.C. 1381 et seq.) or made available by a drinking water treatment revolving loan fund as authorized by section 1452 of the Safe Drinking Water Act (42 U.S.C. 300j-12) shall be used for a project for the construction, alteration, maintenance, or repair of a public water system or treatment works unless all of the iron and steel products used in the project are produced in the United States.

(2) In this section, the term “iron and steel products” means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.

(b) Subsection (a) shall not apply in any case or category of cases in which the Administrator of the Environmental Protection Agency (in this section referred to as the “Administrator”) finds that—

(1) applying subsection (a) would be inconsistent with the public interest;

(2) iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or

(3) inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

(c) If the Administrator receives a request for a waiver under this section, the Administrator shall make available to the public on an informal basis a copy of the request and information available to the Administrator concerning the request, and shall allow for informal public input on the request for at least 15 days prior to making a finding based on the request. The Administrator shall make the request and accompanying information available by electronic means, including on the official public Internet Web site of the Environmental Protection Agency.

(d) This section shall be applied in a manner consistent with United States obligations under international agreements.

(e) The Administrator may retain up to 0.25 percent of the funds appropriated in this Act for the Clean and Drinking Water State Revolving Funds for carrying out

the provisions described in subsection (a)(1) for management and oversight of the requirements of this section.

(f) This section does not apply with respect to a project if a State agency approves the engineering plans and specifications for the project, in that agency's capacity to approve such plans and specifications prior to a project requesting bids, prior to the date of the enactment of this Act.

The following questions and answers provide guidance for implementing and complying with the AIS requirements:

Project Coverage

1) What classes of projects are covered by the AIS requirement?

All treatment works projects funded by a CWSRF assistance agreement, and all public water system projects funded by a DWSRF assistance agreement, from the date of enactment through the end of Federal Fiscal Year 2014, are covered. The AIS requirements apply to the entirety of the project, no matter when construction begins or ends. Additionally, the AIS requirements apply to all parts of the project, no matter the source of funding.

2) Does the AIS requirement apply to nonpoint source projects or national estuary projects?

No. Congress did not include an AIS requirement for nonpoint source and national estuary projects unless the project can also be classified as a 'treatment works' as defined by section 212 of the Clean Water Act.

3) Are any projects for the construction, alteration, maintenance, or repair of a public water system or treatment works excluded from the AIS requirement?

Any project, whether a treatment works project or a public water system project, for which engineering plans and specifications were approved by the responsible state agency prior to January 17, 2014, is excluded from the AIS requirements.

4) What if the project does not have approved engineering plans and specifications but has signed an assistance agreement with a CWSRF or DWSRF program prior to January 17, 2014?

The AIS requirements do not apply to any project for which an assistance agreement was signed prior to January 17, 2014.

5) What if the project does not have approved engineering plans and specifications, but bids were advertised prior to January 17, 2014 and an assistance agreement was signed after January 17, 2014?

If the project does not require approved engineering plans and specifications, the bid advertisement date will count in lieu of the approval date for purposes of the exemption in section 436(f).

6) What if the assistance agreement that was signed prior to January 17, 2014, only funded a part of the overall project, where the remainder of the project will be funded later with another SRF loan?

If the original assistance agreement funded any construction of the project, the date of the original assistance agreement counts for purposes of the exemption. If the original assistance agreement was only for planning and design, the date of that assistance agreement will count for purposes of the exemption only if there is a written commitment or expectation on the part of the assistance recipient to fund the remainder of the project with SRF funds.

7) What if the assistance agreement that was signed prior to January 17, 2014, funded the first phase of a multi-phase project, where the remaining phases will be funded by SRF assistance in the future?

In such a case, the phases of the project will be considered a single project if all construction necessary to complete the building or work, regardless of the number of contracts or assistance agreements involved, are closely related in purpose, time and place. However, there are many situations in which major construction activities are clearly undertaken in phases that are distinct in purpose, time, or place. In the case of distinct phases, projects with engineering plans and specifications approval or assistance agreements signed prior to January 17, 2014 would be excluded from AIS requirements while those approved/signed on January 17, 2014, or later would be covered by the AIS requirements.

8) What if a project has split funding from a non-SRF source?

Many States intend to fund projects with “split” funding, from the SRF program and from State or other programs. Based on the Act language in section 436, which requires that American iron and steel products be used in any project for the construction, alteration, maintenance, or repair of a public water system or treatment works receiving SRF funding between and including January 17, 2014 and September 30, 2014, any project that is funded in whole or in part with such funds must comply with the AIS requirement. A “project” consists of all construction necessary to complete the building or work regardless of the number of contracts or assistance agreements involved so long as all contracts and assistance agreements awarded are closely related in purpose, time and place. This precludes the intentional splitting of SRF projects into separate and smaller contracts or assistance agreements to avoid AIS coverage on some portion of a larger project, particularly where the activities are integrally and proximately related to the whole. However, there are many situations in which major construction activities are clearly undertaken in separate phases that are distinct in purpose, time, or place, in which

case, separate contracts or assistance agreement for SRF and State or other funding would carry separate requirements.

9) What about refinancing?

If a project began construction, financed from a non-SRF source, prior to January 17, 2014, but is refinanced through an SRF assistance agreement executed on or after January 17, 2014 and prior to October 1, 2014, AIS requirements will apply to all construction that occurs on or after January 17, 2014, through completion of construction, unless, as is likely, engineering plans and specifications were approved by a responsible state agency prior to January 17, 2014. There is no retroactive application of the AIS requirements where a refinancing occurs for a project that has completed construction prior to January 17, 2014.

10) Do the AIS requirements apply to any other EPA programs, besides the SRF program, such as the Tribal Set-aside grants or grants to the Territories and DC?

No, the AIS requirement only applies to funds made available by a State water pollution control revolving fund as authorized by title VI of the Federal Water Pollution Control Act (33 U.S.C. 1381 et seq.) or made available by a drinking water treatment revolving loan fund as authorized by section 1452 of the Safe Drinking Water Act (42 U.S.C. 300j-12)

Covered Iron and Steel Products

11) What is an iron or steel product?

For purposes of the CWSRF and DWSRF projects that must comply with the AIS requirement, an iron or steel product is one of the following made primarily of iron or steel that is permanently incorporated into the public water system or treatment works:

- Lined or unlined pipes or fittings;
- Manhole Covers;
- Municipal Castings (defined in more detail below);
- Hydrants;
- Tanks;
- Flanges;
- Pipe clamps and restraints;
- Valves;
- Structural steel (defined in more detail below);
- Reinforced precast concrete; and
- Construction materials (defined in more detail below).

12) What does the term ‘primarily iron or steel’ mean?

‘Primarily iron or steel’ places constraints on the list of products above. For one of the listed products to be considered subject to the AIS requirements, it must be made of greater than 50% iron or steel, measured by cost. The cost should be based on the material costs.

13) Can you provide an example of how to perform a cost determination?

For example, the iron portion of a fire hydrant would likely be the bonnet, body and shoe, and the cost then would include the pouring and casting to create those components. The other material costs would include non-iron and steel internal workings of the fire hydrant (i.e., stem, coupling, valve, seals, etc). However, the assembly of the internal workings into the hydrant body would not be included in this cost calculation. If one of the listed products is not made primarily of iron or steel, United States (US) provenance is not required. An exception to this definition is reinforced precast concrete, which is addressed in a later question.

14) If a product is composed of more than 50% iron or steel, but is not listed in the above list of items, must the item be produced in the US? Alternatively, must the iron or steel in such a product be produced in the US?

The answer to both question is no. Only items on the above list must be produced in the US. Additionally, the iron or steel in a non-listed item can be sourced from outside the US.

15) What is the definition of steel?

Steel means an alloy that includes at least 50 percent iron, between .02 and 2 percent carbon, and may include other elements. Metallic elements such as chromium, nickel, molybdenum, manganese, and silicon may be added during the melting of steel for the purpose of enhancing properties such as corrosion resistance, hardness, or strength. The definition of steel covers carbon steel, alloy steel, stainless steel, tool steel and other specialty steels.

16) What does ‘produced in the United States’ mean?

Production in the United States of the iron or steel products used in the project requires that all manufacturing processes, including application of coatings, must take place in the United States, with the exception of metallurgical processes involving refinement of steel additives. All manufacturing processes includes processes such as melting, refining, forming, rolling, drawing, finishing, fabricating and coating. Further, if a domestic iron and steel product is taken out of the US for any part of the manufacturing process, it becomes foreign source material. However, raw materials such as iron ore, limestone and iron and steel scrap are not covered by the AIS requirement, and the material(s), if any, being applied as a coating are similarly not covered. Non-iron or steel components of an iron and steel product may come from non-US sources. For example, for products such as valves and hydrants, the individual non-iron and steel components

do not have to be of domestic origin.

17) Are the raw materials used in the production of iron or steel required to come from US sources?

No. Raw materials, such as iron ore, limestone, scrap iron, and scrap steel, can come from non-US sources.

18) If an above listed item is primarily made of iron or steel, but is only at the construction site temporarily, must such an item be produced in the US?

No. Only the above listed products made primarily of iron or steel, permanently incorporated into the project must be produced in the US. For example trench boxes, scaffolding or equipment, which are removed from the project site upon completion of the project, are not required to be made of U.S. Iron or Steel.

19) What is the definition of ‘municipal castings’?

Municipal castings are cast iron or steel infrastructure products that are melted and cast. They typically provide access, protection, or housing for components incorporated into utility owned drinking water, storm water, wastewater, and surface infrastructure. They are typically made of grey or ductile iron, or steel. Examples of municipal castings are:

- Access Hatches;
- Ballast Screen;
- Benches (Iron or Steel);
- Bollards;
- Cast Bases;
- Cast Iron Hinged Hatches, Square and Rectangular;
- Cast Iron Riser Rings;
- Catch Basin Inlet;
- Cleanout/Monument Boxes;
- Construction Covers and Frames;
- Curb and Corner Guards;
- Curb Openings;
- Detectable Warning Plates;
- Downspout Shoes (Boot, Inlet);
- Drainage Grates, Frames and Curb Inlets;
- Inlets;
- Junction Boxes;
- Lampposts;
- Manhole Covers, Rings and Frames, Risers;

Meter Boxes;
Service Boxes;
Steel Hinged Hatches, Square and Rectangular;
Steel Riser Rings;
Trash receptacles;
Tree Grates;
Tree Guards;
Trench Grates; and
Valve Boxes, Covers and Risers.

20) What is ‘structural steel’?

Structural steel is rolled flanged shapes, having at least one dimension of their cross-section three inches or greater, which are used in the construction of bridges, buildings, ships, railroad rolling stock, and for numerous other constructional purposes. Such shapes are designated as wide-flange shapes, standard I-beams, channels, angles, tees and zees. Other shapes include H-piles, sheet piling, tie plates, cross ties, and those for other special purposes.

21) What is a ‘construction material’ for purposes of the AIS requirement?

Construction materials are those articles, materials, or supplies made primarily of iron and steel, that are permanently incorporated into the project, not including mechanical and/or electrical components, equipment and systems. Some of these products may overlap with what is also considered “structural steel”. This includes, but is not limited to, the following products: wire rod, bar, angles, concrete reinforcing bar, wire, wire cloth, wire rope and cables, tubing, framing, joists, trusses, fasteners (i.e., nuts and bolts), welding rods, decking, grating, railings, stairs, access ramps, fire escapes, ladders, wall panels, dome structures, roofing, ductwork, surface drains, cable hanging systems, manhole steps, fencing and fence tubing, guardrails, doors, and stationary screens.

22) What is not considered a ‘construction material’ for purposes of the AIS requirement?

Mechanical and electrical components, equipment and systems are not considered construction materials. Mechanical equipment is typically that which has motorized parts and/or is powered by a motor. Electrical equipment is typically any machine powered by electricity and includes components that are part of the electrical distribution system.

The following examples (including their appurtenances necessary for their intended use and operation) are NOT considered construction materials: pumps, motors, gear reducers, drives (including variable frequency drives (VFDs)), electric/pneumatic/manual accessories used to operate valves (such as electric valve actuators), mixers, gates, motorized screens (such as traveling screens), blowers/aeration equipment, compressors, meters, sensors, controls and switches, supervisory control and data acquisition (SCADA), membrane bioreactor systems, membrane filtration systems, filters, clarifiers and clarifier mechanisms, rakes, grinders, disinfection systems, presses (including belt presses), conveyors, cranes, HVAC (excluding ductwork), water heaters,

heat exchangers, generators, cabinetry and housings (such as electrical boxes/enclosures), lighting fixtures, electrical conduit, emergency life systems, metal office furniture, shelving, laboratory equipment, analytical instrumentation, and dewatering equipment.

23) If the iron or steel is produced in the US, may other steps in the manufacturing process take place outside of the US, such as assembly?

No. Production in the US of the iron or steel used in a listed product requires that all manufacturing processes must take place in the United States, except metallurgical processes involving refinement of steel additives.

24) What processes must occur in the US to be compliant with the AIS requirement for reinforced precast concrete?

While reinforced precast concrete may not be at least 50% iron or steel, in this particular case, the reinforcing bar and wire must be produced in the US and meet the same standards as for any other iron or steel product. Additionally, the casting of the concrete product must take place in the US. The cement and other raw materials used in concrete production are not required to be of domestic origin.

If the reinforced concrete is cast at the construction site, the reinforcing bar and wire are considered to be a construction material and must be produced in the US.

Compliance

25) How should an assistance recipient document compliance with the AIS requirement?

In order to ensure compliance with the AIS requirement, specific AIS contract language must be included in each contract, starting with the assistance agreement, all the way down to the purchase agreements. Sample language for assistance agreements and contracts can be found in Appendix 3 and 4.

EPA recommends the use of a step certification process, similar to one used by the Federal Highway Administration. The step certification process is a method to ensure that producers adhere to the AIS requirement and assistance recipients can verify that products comply with the AIS requirement. The process also establishes accountability and better enables States to take enforcement actions against violators.

Step certification creates a paper trail which documents the location of the manufacturing process involved with the production of steel and iron materials. A step certification is a process under which each handler (supplier, fabricator, manufacturer,

processor, etc) of the iron and steel products certifies that their step in the process was domestically performed. Each time a step in the manufacturing process takes place, the manufacturer delivers its work along with a certification of its origin. A certification can be quite simple. Typically, it includes the name of the manufacturer, the location of the manufacturing facility where the product or process took place (not its headquarters), a description of the product or item being delivered, and a signature by a manufacturer's responsible party. Attached, as Appendix 5, are sample certifications. These certifications should be collected and maintained by assistance recipients.

Alternatively, the final manufacturer that delivers the iron or steel product to the worksite, vendor, or contractor, may provide a certification asserting that all manufacturing processes occurred in the US. While this type of certification may be acceptable, it may not provide the same degree of assurance. Additional documentation may be needed if the certification is lacking important information. Step certification is the best practice.

26) How should a State ensure assistance recipients are complying with the AIS requirement?

In order to ensure compliance with the AIS requirement, States SRF programs must include specific AIS contract language in the assistance agreement. Sample language for assistance agreements can be found in Appendix 3.

States should also, as a best practice, conduct site visits of projects during construction and review documentation demonstrating proof of compliance which the assistance recipient has gathered.

27) What happens if a State or EPA finds a non-compliant iron and/or steel product permanently incorporated in the project?

If a potentially non-compliant product is identified, the State should notify the assistance recipient of the apparent unauthorized use of the non-domestic component, including a proposed corrective action, and should be given the opportunity to reply. If unauthorized use is confirmed, the State can take one or more of the following actions: request a waiver where appropriate; require the removal of the non-domestic item; or withhold payment for all or part of the project. Only EPA can issue waivers to authorize the use of a non-domestic item. EPA may use remedies available to it under the Clean Water Act, the Safe Drinking Water Act, and 40 CFR part 31 grant regulations, in the event of a violation of a grant term and condition.

It is recommended that the State work collaboratively with EPA to determine the appropriate corrective action, especially in cases where the State is the one who identifies the item in noncompliance or there is a disagreement with the assistance recipient.

If fraud, waste, abuse, or any violation of the law is suspected, the Office of Inspector General (OIG) should be contacted immediately. The OIG can be reached at 1-888-546-8740 or OIG_Hotline@epa.gov. More information can be found at this website: <http://www.epa.gov/oig/hotline.htm>.

28) How do international trade agreements affect the implementation of the AIS requirements?

The AIS provision applies in a manner consistent with United States obligations under international agreements. Typically, these obligations only apply to direct procurement by the entities that are signatories to such agreements. In general, SRF assistance recipients are not signatories to such agreements, so these agreements have no impact on this AIS provision. In the few instances where such an agreement applies to a municipality, that municipality is under the obligation to determine its applicability and requirements and document the actions taken to comply for the State.

Waiver Process

The statute permits EPA to issue waivers for a case or category of cases where EPA finds (1) that applying these requirements would be inconsistent with the public interest; (2) iron and steel products are not produced in the US in sufficient and reasonably available quantities and of a satisfactory quality; or (3) inclusion of iron and steel products produced in the US will increase the cost of the overall project by more than 25 percent.

In order to implement the AIS requirements, EPA has developed an approach to allow for effective and efficient implementation of the waiver process to allow projects to proceed in a timely manner. The framework described below will allow States, on behalf of the assistance recipients, to apply for waivers of the AIS requirement directly to EPA Headquarters. Only waiver requests received from states will be considered. Pursuant to the Act, EPA has the responsibility to make findings as to the issuance of waivers to the AIS requirements.

Definitions

The following terms are critical to the interpretation and implementation of the AIS requirements and apply to the process described in this memorandum:

Reasonably Available Quantity: The quantity of iron or steel products is available or will be available at the time needed and place needed, and in the proper form or specification as specified in the project plans and design.

Satisfactory Quality: The quality of iron or steel products, as specified in the project plans and designs.

Assistance Recipient: A borrower or grantee that receives funding from a State CWSRF or DWSRF program.

Step-By-Step Waiver Process

Application by Assistance Recipient

Each local entity that receives SRF water infrastructure financial assistance is required by section 436 of the Act to use American made iron and steel products in the construction of its project. However, the recipient may request a waiver. Until a waiver is granted by EPA, the AIS requirement stands, except as noted above with respect to municipalities covered by international agreements.

The waiver process begins with the SRF assistance recipient. In order to fulfill the AIS requirement, the assistance recipient must in good faith design the project (where applicable) and solicit bids for construction with American made iron and steel products. It is essential that the assistance recipient include the AIS terms in any request for proposals or solicitations for bids, and in all contracts (see Appendix 3 for sample construction contract language). The assistance recipient may receive a waiver at any point before, during, or after the bid process, if one or more of three conditions is met:

1. Applying the American Iron and Steel requirements of the Act would be inconsistent with the public interest;
2. Iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or
3. Inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

Proper and sufficient documentation must be provided by the assistance recipient. A checklist detailing the types of information required for a waiver to be processed is attached as Appendix 1.

Additionally, it is strongly encouraged that assistance recipients hold pre-bid conferences with potential bidders. A pre-bid conference can help to identify iron and steel products needed to complete the project as described in the plans and specifications that may not be available from domestic sources. It may also identify the need to seek a waiver prior to bid, and can help inform the recipient on compliance options.

In order to apply for a project waiver, the assistance recipient should email the request in the form of a Word document (.doc) to the State SRF program. It is strongly recommended that the State designate a single person for all AIS communications. The State SRF designee will review the application for the waiver and determine whether the necessary information has been included. Once the waiver application is complete, the State designee will forward the application to the EPA for review.

Evaluation by EPA

After receiving an application for waiver of the AIS requirements, EPA Headquarters will publish the request on its website for 15 days and receive informal comment. EPA Headquarters will then use the checklist in Appendix 2 to determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver – that it is quantitatively and qualitatively sufficient – and to

determine whether or not to grant the waiver.

In the event that EPA finds that adequate documentation and justification has been submitted, the Administrator may grant a waiver to the assistance recipient. EPA will notify the State designee that a waiver request has been approved or denied as soon as such a decision has been made. Granting such a waiver is a three-step process:

1. Posting – After receiving an application for a waiver, EPA is required to publish the application and all material submitted with the application on EPA’s website for 15 days. During that period, the public will have the opportunity to review the request and provide informal comment to EPA. The website can be found at: http://water.epa.gov/grants_funding/aisrequirement.cfm
2. Evaluation – After receiving an application for waiver of the AIS requirements, EPA Headquarters will use the checklist in Appendix 2 to determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver – that it is quantitatively and qualitatively sufficient – and to determine whether or not to grant the waiver.
3. Signature of waiver approval by the Administrator or another agency official with delegated authority – As soon as the waiver is signed and dated, EPA will notify the State SRF program, and post the signed waiver on our website. The assistance recipient should keep a copy of the signed waiver in its project files.

Public Interest Waivers

EPA has the authority to issue public interest waivers. Evaluation of a public interest waiver request may be more complicated than that of other waiver requests so they may take more time than other waiver requests for a decision to be made. An example of a public interest waiver that might be issued could be for a community that has standardized on a particular type or manufacturer of a valve because of its performance to meet their specifications. Switching to an alternative valve may require staff to be trained on the new equipment and additional spare parts would need to be purchased and stocked, existing valves may need to be unnecessarily replaced, and portions of the system may need to be redesigned. Therefore, requiring the community to install an alternative valve would be inconsistent with public interest.

EPA also has the authority to issue a public interest waiver that covers categories of products that might apply to all projects.

EPA reserves the right to issue national waivers that may apply to particular classes of assistance recipients, particular classes of projects, or particular categories of iron or steel products. EPA may develop national or (US geographic) regional categorical waivers through the identification of similar circumstances in the detailed justifications presented to EPA in a waiver request or requests. EPA may issue a national waiver based on policy decisions regarding the public's interest or a determination that a particular item is not produced domestically in reasonably available quantities or of a sufficient quality. In such cases, EPA may determine it is necessary to issue a national waiver.

If you have any questions concerning the contents of this memorandum, you may contact us, or have your staff contact Jordan Dorfman, Attorney-Advisor, State Revolving Fund Branch, Municipal Support Division, at dorfman.jordan@epa.gov or (202) 564-0614 or Kiri Anderer, Environmental Engineer, Infrastructure Branch, Drinking Water Protection Division, at anderer.kirsten@epa.gov or (202) 564-3134.

Attachments

Appendix 1: Information Checklist for Waiver Request

The purpose of this checklist is to help ensure that all appropriate and necessary information is submitted to EPA. EPA recommends that States review this checklist carefully and provide all appropriate information to EPA. This checklist is for informational purposes only and does not need to be included as part of a waiver application.

	✓	Notes
Items		
<p>General</p> <ul style="list-style-type: none"> • Waiver request includes the following information: <ul style="list-style-type: none"> – Description of the foreign and domestic construction materials – Unit of measure – Quantity – Price – Time of delivery or availability – Location of the construction project – Name and address of the proposed supplier – A detailed justification for the use of foreign construction materials • Waiver request was submitted according to the instructions in the memorandum • Assistance recipient made a good faith effort to solicit bids for domestic iron and steel products, as demonstrated by language in requests for proposals, contracts, and communications with the prime contractor 	✓	
<p>Cost Waiver Requests</p> <ul style="list-style-type: none"> • Waiver request includes the following information: <ul style="list-style-type: none"> – Comparison of overall cost of project with domestic iron and steel products to overall cost of project with foreign iron and steel products – Relevant excerpts from the bid documents used by the contractors to complete the comparison – Supporting documentation indicating that the contractor made a reasonable survey of the market, such as a description of the process for identifying suppliers and a list of contacted suppliers 		
<p>Availability Waiver Requests</p> <ul style="list-style-type: none"> • Waiver request includes the following supporting documentation necessary to demonstrate the availability, quantity, and/or quality of the materials for which the waiver is requested: <ul style="list-style-type: none"> – Supplier information or pricing information from a reasonable number of domestic suppliers indicating availability/delivery date for construction materials – Documentation of the assistance recipient's efforts to find available domestic sources, such as a description of the process for identifying suppliers and a list of contacted suppliers. – Project schedule – Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of construction materials • Waiver request includes a statement from the prime contractor and/or supplier confirming the non-availability of the domestic construction materials for which the waiver is sought • Has the State received other waiver requests for the materials described in this waiver request, for comparable projects? 		

Appendix 2: HQ Review Checklist for Waiver Request

Instructions: To be completed by EPA. Review all waiver requests using the questions in the checklist, and mark the appropriate box as Yes, No or N/A. Marks that fall inside the shaded boxes may be grounds for denying the waiver. If none of your review markings fall into a shaded box, the waiver is eligible for approval if it indicates that one or more of the following conditions applies to the domestic product for which the waiver is sought:

1. The iron and/or steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality.
2. The inclusion of iron and/or steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

Review Items	Yes	No	N/A	Comments
Cost Waiver Requests <ul style="list-style-type: none"> Does the waiver request include the following information? <ul style="list-style-type: none"> Comparison of overall cost of project with domestic iron and steel products to overall cost of project with foreign iron and steel products Relevant excerpts from the bid documents used by the contractors to complete the comparison A sufficient number of bid documents or pricing information from domestic sources to constitute a reasonable survey of the market Does the Total Domestic Project exceed the Total Foreign Project Cost by more than 25%? 				
Availability Waiver Requests <ul style="list-style-type: none"> Does the waiver request include supporting documentation sufficient to show the availability, quantity, and/or quality of the iron and/or steel product for which the waiver is requested? <ul style="list-style-type: none"> Supplier information or other documentation indicating availability/delivery date for materials Project schedule Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of materials Does supporting documentation provide sufficient evidence that the contractors made a reasonable effort to locate domestic suppliers of materials, such as a description of the process for identifying suppliers and a list of contacted suppliers? Based on the materials delivery/availability date indicated in the supporting documentation, will the materials be unavailable when they are needed according to the project schedule? (By item, list schedule date and domestic delivery quote date or other relevant information) Is EPA aware of any other evidence indicating the non-availability of the materials for which the waiver is requested? <p>Examples include:</p> <ul style="list-style-type: none"> Multiple waiver requests for the materials described in this waiver request, for comparable projects in the same State Multiple waiver requests for the materials described in this waiver request, for comparable projects in other States Correspondence with construction trade associations indicating the non-availability of the materials Are the available domestic materials indicated in the bid documents of inadequate quality compared those required by the project plans, specifications, and/or permits? 				

Appendix 5: Sample Certifications

The following information is provided as a sample letter of **step** certification for AIS compliance. Documentation must be provided on company letterhead.

Date

Company Name

Company Address

City, State Zip

Subject: American Iron and Steel Step Certification for Project (XXXXXXXXXX)

I, (company representative), certify that the (melting, bending, coating, galvanizing, cutting, etc.) process for (manufacturing or fabricating) the following products and/or materials shipped or provided for the subject project is in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. XXXX
2. XXXX
3. XXXX

Such process took place at the following location:

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

The following information is provided as a sample letter of certification for AIS compliance. Documentation must be provided on company letterhead.

Date

Company Name

Company Address

City, State Zip

Subject: American Iron and Steel Certification for Project (XXXXXXXXXX)

I, (company representative), certify that the following products and/or materials shipped/provided to the subject project are in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. XXXX
2. XXXX
3. XXXX

Such process took place at the following location:

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

**American Iron & Steel (AIS) Requirement of the Consolidated Appropriations Act of 2014
(Public Law 113-76)**

Q&A Part 2

PRODUCT QUESTIONS

1. Q: Do all fasteners qualify for de minimis exemption?

A: No. There is no broad exemption for fasteners from the American Iron and Steel (AIS) requirements. Significant fasteners used in SRF projects are not subject to the de minimis waiver for projects and must comply with the AIS requirements. Significant fasteners include fasteners produced to industry standards (e.g., ASTM standards) and/or project specifications, special ordered or those of high value. When bulk purchase of unknown-origin fasteners that are of incidental use and small value are used on a project, they may fall under the national de minimis waiver for projects. The list of potential items could be varied, such as big-box/hardware-store-variety screws, nails, and staples. The key characteristics of the items that may qualify for the de minimis waiver would be items that are incidental to the project purpose (such as drywall screws) and not significant in value or purpose (such as common nails or brads).

EPA also clarifies that minor components of two listed products – valves and hydrants -- may not need to meet the AIS requirements if the minor components compromise a very small quantity of minor, low-cost fasteners that are of unknown origin.

2. Q: Does PCCP pipe have to be domestically produced?

A: Yes. Pre-stressed concrete cylinder pipe (PCCP) or other similar concrete cylinder pipes would be comparable to pre-cast concrete which is specifically listed in the Consolidated Appropriations Act of 2014 as a product subject to the AIS requirement.

3. Q: If the iron or steel is made from recycled metals will the vendor/supplier have to provide a certification document certifying that the recycled metals are domestically produced?

A: No. Recycled source materials used in the production of iron and steel products do not have to come from the U.S. Iron or steel scrap, for instance, are considered raw materials that may come from anywhere. While certification is not required for the raw material, EPA does recommend that additional final processing of iron and steel be certified to have occurred in the U.S.

4. Q: Do tanks used for filtration systems, if delivered to the construction site separately and then filled with filtration media onsite, have to be domestically produced?

A: No. Tanks that are specifically designed to be filters, or as parts of a filtration system, do not have to be domestically produced because these parts are no longer simply tanks, even if the filter media has not been installed and will be installed at the project site, as is customary to do for shipping purposes. These parts have only one purpose which is to be housing for filters and cannot be used in another fashion.

5. Q: Can a recipient use non-domestic flanged pipe?

A: No. While the Consolidated Appropriations Act of 2014 does not specifically mention flanged pipe, since it does mention both pipe and flanges, both products would need to be domestically produced. Therefore, flanged pipe would also need to be domestically produced.

6. Q: Can a recipient use non-domestic couplings, expansion joints, and other similar pipe connectors?

A: No. These products would be considered specialty fittings, due to their additional functionality, but still categorized under the larger “fitting” categorization. Fittings are defined as a material that joins pipes together or connects to a pipe (AWWA, The Drinking Water Dictionary, 2000). Therefore, these products must comply with the AIS requirements and be produced domestically.

7. Q: Can a recipient use non-domestic service saddles and tapping sleeves?

A: No. These products are necessary for pipe repair, to tap a water main, or to install a service or house connection. Therefore, they are included under the larger “pipe restraint” category which is a specifically identified product subject to the domestic preference in the Consolidated Appropriations Act of 2014.

8. Q: The AIS guidance does not appear to cover reused items (i.e., existing pipe fittings, used storage tanks, reusing existing valves). How should reused items be addressed?

A: The AIS guidance does not address reuse of items. Reuse of items that would otherwise be covered by AIS is acceptable provided that the item(s) was originally purchased prior to January 17, 2014, the reused item(s) is not substantially altered from original form/function, and any restoration work that may be required does not include the replacement or addition of foreign iron or steel replacement parts. EPA recommends keeping a log of these reused items by including them on the assistance recipient’s de minimis list, and stating therein that these items are reused products. The donation of new items (such as a manufacturer waiving cost for certain delivered items because of concerns regarding the origin of a new product) is not, however, considered reuse.

9. Q: What does “time needed” mean in the AIS guidance, in reference to the definition of “Reasonably Available Quantity”?

A: For considering whether a product would meet reasonably available quantity, “time needed” is based on the construction schedule. If the item is delayed and there is substantial impact on the overall construction schedule, this would not be according to the “time needed.”

10. Q: If a product is not specifically included on the list of AIS covered products, must it comply with AIS?

A: Possibly. The AIS requirements include a list of specifically covered products, one of which is construction materials, a broad category of potential products. For construction materials, EPA’s AIS guidance includes a set of example items that it considers construction materials composed primarily of iron and steel and covered by the Act. This example list in the guidance is not an all-inclusive list of potential construction materials. However, the guidance also includes a list of items that EPA specifically does not consider construction materials, generally those of electrical or complex-mechanical nature. If a product is similar to the ones in the non-construction material list (and it is also not specifically listed by the Act), it is not a construction material. For all other items specifically included in the Act, coverage is generally self-evident.

11. Q: If a listed iron and steel product is used as a part for an assembled product that is non-domestic, do the AIS requirements apply?

A: AIS requirements only apply to the final product as delivered to the work site and incorporated into the project. Other assemblies, such as a pumping assembly or a reverse osmosis package plant, are distinct products not listed and do not need to be made in the U.S. or composed of all U.S. parts. Therefore, for the case of a non-covered product used in a larger non-domestic assembly, the components, even if specifically listed in the Consolidated Appropriations Act, do not have to be domestically produced.

12. Q: Is cast iron excluded from the AIS requirements?

A: No. Cast iron products that fall under the definition of iron and steel products must comply with the AIS requirements.

13. Q: The guidance states that “construction materials” do not include mechanical equipment, but then identifies ductwork as a construction material. Please clarify.

A: Ductwork is not mechanical equipment, therefore it is considered a “construction material” and must comply with the AIS requirements.

14. Q: Do “meters” mentioned in EPA’s guidance as non-construction materials include both flow meters and water meters?

A: Yes. “Meters” includes any type of meter, including: flow meters, wholesale meters, and water meters/service connections.

15. Q: Must coiled steel be domestic?

A: Yes. Coiled steel is an intermediate product used in the production of steel pipe and must come from a U.S. source or subject to a waiver in order to comply with the AIS requirements.

16. Q: Are pig iron, direct reduced iron (DRI), and ingot considered raw materials?

A: No. These are considered intermediate products used in the production of iron or steel and must come from a U.S. source or subject to a waiver in order to comply with the AIS requirements.

17. Q: Can assistance recipients rely on a marking that reads, “Made in the USA,” as evidence that all processes took place in the U.S.?

A: No. This designation is not consistent with our requirements that all manufacturing processes of iron and steel products must take place in the U.S.

18. Q: When determining what constitutes a product made “primarily” of iron or steel, who makes this determination?

A: The manufacturer will show if its product qualifies as primarily made of iron or steel. The recipient should expect the manufacturer to provide documentation/ certification that its product is AIS compliant.

19. Q: Do aerators need to be produced domestically in order to comply with AIS?

A: No. Aerators, similar to pumps, are mechanical equipment that do not need to meet the AIS requirements. “Blowers/aeration equipment, compressors” are listed in EPA’s guidance as non-construction materials.

20. Q: Are Sluice and Slide Gates considered valves?

A: No. Valves are products that are generally encased / enclosed with a body, bonnet, and stem. Examples include enclosed butterfly, ball, globe, piston, check, wedge, and gate valves. Furthermore, “gates” (meaning sluice, slide or weir gates) are listed in EPA’s guidance as non-construction materials.

AIS PROCESS QUESTIONS

21. Q: Will notices of waiver applications be published in the federal register?

A: No. Applications for waivers will be published on EPA’s website (http://water.epa.gov/grants_funding/aisrequirement.cfm). EPA will provide 15 days for open public comment, as noted on the website.

22. Q: Will states be collecting the step certification paper trail, as presented in the AIS guidance?

A. No. Assistance recipients must maintain documentation of compliance with AIS. EPA recommends use of the step certification process. This process is a best practice and traces all manufacturing of iron and steel products to the U.S. If the process is used, the state does not have to collect the documentation. The documents must be kept by the assistance recipient and reviewed by the state during project reviews.

23. Q: Why is it considered a best practice for states to conduct site visits, when it is the assistance recipient's responsibility to meet the AIS requirements?

A: It is both the assistance recipient's and the state's responsibility to ensure compliance with the AIS requirements. The state is the recipient of a federal grant and must comply with all grant conditions, including a condition requiring that the AIS requirements be adhered to. Therefore, it is recommended that states conduct site visits of projects during construction and review documentation demonstrating the assistance recipient's proof of compliance.

24. Q: Please further define the state's role in the waiver process.

A: The state's role in the waiver process is to review any waiver requests submitted to the state in order to ensure that all necessary information has been provided by the assistance recipient prior to forwarding the request to EPA. If a state finds the request lacking, the state should work with the assistance recipient to help obtain complete information.

25. Q: How much time does EPA have to evaluate the waiver during the evaluation step?

A: At a minimum, EPA is required to provide 15 days for open public comment. There is no specific deadline or time limit for EPA to review waiver requests. Each waiver request will come with its own specific details and circumstances and may require a different amount of time for review and analysis. For example, public interest waivers in general may take longer to review than availability waivers which are typically more straightforward. However, EPA understands that construction may be delayed while waiting for a waiver and will make every effort to review and issue decisions on waiver requests in a timely manner.

PROJECT QUESTIONS

26. Q: What if a project is funded by another funding entity (i.e., United States Department of Agriculture – Rural Development) where AIS is not required and begins construction after January 17, 2014 but then applies to the SRF to refinance the project? Are they ineligible?

A: The project is not ineligible. AIS requirements will apply to any construction that occurs after the assistance agreement is signed, through the end of construction. If construction is complete, there is no retroactive application of the AIS requirements.

27. Q: If the assistance recipient can demonstrate through market research that the AIS requirement will exceed the 25 percent cost threshold, is the entire project exempt from the AIS requirement?

A: If the waiver application shows that the inclusion of American iron and steel products causes the entire cost of the project to increase by more the 25 percent, a waiver may be granted for the entirety of the project.

28. Q: Can the recipient use non-SRF funds to pay for the non-compliant item.

A: No. It is not an acceptable to use non-SRF funds to pay for a non-compliant item. The Consolidated Appropriations Act of 2014 requires that all iron and steel products, no matter the source of funding, must be made in the U.S. if SRF funds are used in the project.

29. Q: What constitutes “satisfactory quality” as defined in the AIS guidance, in reference to the availability waiver process.

A: “Satisfactory quality” means the product meets the project design specifications. A waiver may be granted if a recipient determines that the project plans and design would be compromised because there are no American made products available that meet the project design specifications.

30. Q: The guidance states that the AIS requirement applies to any project “funded in whole or in part” by an SRF. Where is this in the Act?

A: The Act states that, “None of the funds made available by a ... [State SRF program] ... shall be used for a project for the construction, alteration, maintenance, or repair of a public water system or treatment works unless all of the iron and steel products used in the project are produced in the United States.” This sentence clearly states that no SRF program may use its funds for a project unless all of the iron and steel products used in the project are made in the U.S. This is true even if only \$1 of SRF funding is used in the project.

31. Q: There is always an expectation on the part of an assistance recipient that the construction phase of a planning and/or design only loan will be funded through the SRF. If the original planning and/or design only loan was executed prior to a January 17, 2014, does this mean the entire project will be exempt from the AIS requirement?

A: If the original loan includes construction, and was executed prior to January 17, 2014, then the AIS provision does not apply to the project. If the original loan was only for planning and/or design, then a written commitment or documented “expectation” is needed to show exemption from the

requirements. Appearance on a priority list in an Intended Use Plan along with written reasonable assurance from the state that the recipient will receive SRF funding for project construction could provide sufficient evidence of “expectation of funding”.

- 32. Q: What if there has been a change order or redesign requiring new plans and specifications to be approved and they were approved after January 17, 2014: does the project now have to comply with AIS?**

A: In most cases, no. Change orders are typically small enough changes that the original plan and specification date will still hold true. For example, if a pipe alignment has to be changed for a block or two due to unforeseen conditions, but new plans and specifications had to be submitted for this section of the project, then that could be considered a minor change. However, if there has been a major redesign, perhaps the whole project had to be redesigned starting from scratch, then the new plans and specification approval date would apply.

- 33. Q: What if the bids on a project with plans and specifications approved before January 17, 2014 but the loan is signed after January 17, 2014 come in low, and there is significant funding remaining in the loan agreement, so the community designs a second project with the remaining funds: does that project have to comply with the AIS requirements?**

A: If the second project is closely related in purpose, place and time to the first project, then the second project would be exempt from the AIS requirements. It is the assistance recipient’s responsibility (with state oversight) to show that a project is closely related, or not, in purpose, place and time.

- 34. Q: What if the assistance agreement was signed after January 17, 2014, state approval of plans for the first phase of the project was in place prior to January 17, 2014, but state approval of the plans for the second phase of the project was received after January 17, 2014?**

A: In such a case, the AIS provision would not apply to the first phase of the project. If the second phase of the project is considered the same project as the first phase, due to its close relation in purpose, place and time, the entire project may be exempt. It is the assistance recipient’s responsibility (with state oversight) to show that phases of a project is closely related, or not, in purpose, place and time.

- 35. Q: Do products purchased through procurement-only contracts have to be comply with AIS?**

A: Yes. For projects funded by SRF, the products procured under any form of contract must comply with AIS. A procurement-only contract generally involves the bulk purchase of common items (such as pipe, concrete, and/or pumps) of independent timing from a set of planned projects. If products which are purchased through a procurement-only contract are being installed under another contract, the procurement-only contract would probably not be considered a separate project in purpose, place and time; and therefore, would have to comply with the AIS requirements.

March 2015

American Iron & Steel Requirement for the Clean Water and Drinking Water State Revolving Funds

Q&A Part 3

*For CWSRF and DWSRF: On **January 17, 2014**, Public Law 113-76, the "Consolidated Appropriations Act, 2014," was enacted and included an American Iron and Steel requirement for the Clean Water and Drinking Water State Revolving Fund programs through the end of fiscal year 2014. Since then, the AIS requirement has continued for both programs, but through different statutes, with a few changes as described in the questions and answers provided below.*

*For CWSRF: On **June 10, 2014**, the Water Resources Reform and Development Act amended the Clean Water Act to include permanent requirements for the use of AIS products in CWSRF assistance agreements. Section 608 of the CWA now contains requirements for AIS that repeat those of the Consolidated Appropriations Act, 2014. All CWSRF assistance agreements must comply with Section 608 of the CWA for implementation of the permanent AIS requirement.*

*For DWSRF: On **December 16, 2014**, the President signed Public Law 113- 235, the "Consolidated and Further Continuing Appropriations Act, 2015," which provides fiscal year 2015 full-year appropriations through September 30, 2015. This law continues the requirement for the use of AIS products in DWSRF assistance agreements through September 30, 2015.*

CWSRF PROGRAM

- 1. Q: The Water Resources Reform and Development Act amended the Clean Water Act to include permanent requirements for the use of AIS for CWSRF funded assistance agreements. Does the CWA include an exemption for plans and specifications approved prior to the enactment of the legislation similar to the exemption included in the Consolidated Appropriations Act (CAA) 2014?**

A: Yes. The WRRDA amendment to the CWA, which included AIS requirements, included a similar exemption as the CAA 2014. For any CWSRF assistance agreement signed on or after October 1, 2014, if the plans and specifications were approved prior to June 10, 2014 (the enactment of WRRDA), then the project is exempt from AIS requirements. For assistance agreements signed prior to October 1, 2014, the previous dates in the CAA 2014 apply (see March 20, 2014, AIS guidance document).

If a project does not require approved engineering plans and specifications, the bid advertisement date will count in lieu of the plans and specifications approval date for purposes of this exemption in Section 608 (f).

The following table summarizes AIS exemptions based on the plans and specifications approval date for CWSRF funded projects.

3/16/2015

CWSRF AIS Project Exemption Based on Plans and Specifications Approval Date		
<u>Assistance Agreement Signed:</u>	<u>Exempt from AIS if Plans and Specifications Were Approved Before:</u>	<u>Basis for Exemption:</u>
1/17/2014 through 9/30/2014	4/15/2014	<ul style="list-style-type: none"> Consolidated Appropriations Act 2014 National waiver signed 4/15/2014*
On or after 10/1/2014	6/10/2014	<ul style="list-style-type: none"> Clean Water Act Section 608

** To be covered by the national waiver, the plans and specifications had to be submitted to the state prior to 1/17/2014*

2. Q: Does the AIS requirement apply to refinanced CWSRF projects?

A: Yes, in some cases. If a project began construction, financed from a non-CWSRF source prior to June 10, 2014, but is refinanced through a CWSRF assistance agreement executed on or after October 1, 2014, AIS requirements will apply to all construction that occurs on or after June 10, 2014, through completion of construction, unless engineering plans and specifications were approved by the responsible state agency prior to June 10, 2014. For CWSRF projects funded on or after October 1, 2014, there is no retroactive application of the AIS requirements where a refinancing occurs for a project that has completed construction prior to June 10, 2014.

DWSRF PROGRAM

3. Q: The Consolidated and Further Continuing Appropriations Act 2015 continues the AIS requirements for DWSRF funded assistance agreements. Does the Act include an exemption for plans and specifications approved prior to the enactment of the legislation, similar to the exemption included in the Consolidated Appropriations Act (CAA) 2014?

A: Yes. The Consolidated and Further Continuing Appropriations Act 2015 includes a similar exemption as the CAA 2014. For any assistance agreement signed on or after December 16, 2014 (the enactment of the Act), if the plans and specifications were approved prior to December 16, 2014, then the project is exempt from the AIS requirements. For assistance agreements signed prior to December 16, 2014, the previous dates in the CAA 2014 apply (see March 20, 2014 AIS guidance document).

If a project does not require approved engineering plans and specifications, the bid advertisement date will count in lieu of the plans and specifications approval date for purposes of the exemption in Section 424(f).

3/16/2015

4. Q: Do DWSRF assistance agreements signed during the time period between September 30, 2014, and December 16, 2014, still have to comply with the AIS requirements?

A: Yes. The Continuing Appropriations Resolution 2015 was signed on September 19, 2014, which extended funding for the DWSRF with the same conditions that were made applicable by the language in the Fiscal Year 2014 appropriations, including the requirement for the use of American Iron and Steel products in projects receiving financial assistance from the DWSRF. Therefore, all assistance agreements starting October 1, 2014, through the enactment of the Consolidated and Further Continuing Appropriations Act 2015 (signed December 16, 2014), must include the AIS requirements. However, if the plans and specifications for any of these projects were approved prior to April 15, 2014 (the date the national waiver was signed), then the project is exempt from the AIS requirements.

The following table summarizes AIS exemptions based on the plans and specifications approval date for DWSRF funded projects.

DWSRF AIS Project Exemption Based on Plans and Specifications Approval Date		
<u>Assistance Agreement Signed:</u>	<u>Exempt from AIS if Plans and Specifications Were Approved Before:</u>	<u>Basis for Exemption:</u>
1/17/2014 through 9/30/2014	4/15/2014	<ul style="list-style-type: none">• Consolidated Appropriations Act 2014• National waiver signed 4/15/2014*
10/1/2014 through 12/15/2014	4/15/2014	<ul style="list-style-type: none">• Continuing Appropriations Resolution 2015 (continued CAA 2014 requirements)**• National waiver signed 4/15/2014*
12/16/2014 through 9/30/2015	12/16/2014	<ul style="list-style-type: none">• Consolidated and Further Continuing Appropriations Act 2015

** To be covered by the national waiver, the plans and specifications had to be submitted to the state prior to 1/17/2014*

*** Following the first continuing resolution, there were two additional CRs to fill the gap between 12/11/2014 and 12/16/2014*

5. Q: Does the AIS requirement apply to refinanced DWSRF projects?

A: Yes, in some cases. If a project began construction, financed from a non-DWSRF source prior to December 16, 2014, but is refinanced through a DWSRF assistance agreement executed on or after December 16, 2014, AIS requirements will apply to all construction that occurs on or after December 16, 2014, through completion of construction, unless engineering plans and

3/16/2015

specifications were approved by the responsible state agency prior to December 16, 2014. For DWSRF projects funded on or after December 16, 2014, there is no retroactive application of the AIS requirements where a refinancing occurs for a project that has completed construction prior to December 16, 2014.

BOTH CWSRF AND DWSRF PROGRAMS

6. **Q: If a coating is applied to the external surface of a domestic iron or steel component, and the application takes place outside of the United States, would the product be compliant under the AIS requirements?**

A: Yes. The product would still be considered a compliant product under AIS requirements. Any coating processes that are applied to the external surface of iron and steel components that would otherwise be AIS compliant would not disqualify the product from meeting the AIS requirements regardless of where the coating processes occur, provided that final assembly of the product occurs in the United States.

The exemption above only applies to coatings on the *external surface* of iron and steel components. It does not apply to coatings or linings on internal surfaces of iron and steel products, such as the lining of lined pipes. All manufacturing processes for lined pipes, including the application of pipe lining, must occur in the United States for the product to be compliant with AIS requirements.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF WATER

DECISION MEMORANDUM

SUBJECT: De Minimis Waiver of Section 436 of P.L. 113-76, Consolidated Appropriations Act (CAA), 2014

FROM: Nancy K. Stoner
Acting Assistant Administrator

The EPA is hereby granting a nationwide waiver pursuant to the "American Iron and Steel (AIS)" requirements of P.L. 113-76, Consolidated Appropriations Act, 2014 (Act), section 436 under the authority of Section 436(b)(1) (public interest waiver) for de minimis incidental components of eligible water infrastructure projects. This action permits the use of products when they occur in de minimis incidental components of such projects funded by the Act that may otherwise be prohibited under section 436(a). Funds used for such de minimis incidental components cumulatively may comprise no more than a total of 5 percent of the total cost of the materials used in and incorporated into a project; the cost of an individual item may not exceed 1 percent of the total cost of the materials used in and incorporated into a project.

P.L. 113-76, Consolidated Appropriations Act, 2014 (Act), includes an "American Iron and Steel" (AIS) requirement in section 436 that requires Clean Water State Revolving Loan Fund (CWSRF) and Drinking Water State Revolving Loan Fund (DWSRF) assistance recipients to use specific domestic iron and steel products that are produced in the United States if the project is funded through an assistance agreement executed beginning January 17, 2014 (enactment of the Act), through the end of Fiscal Year 2014, unless the agency determines it necessary to waive this requirement based on findings set forth in Section 436(b). The Act states, "[the requirements] shall not apply in any case or category of cases in which the Administrator of the Environmental Protection Agency...finds that- (1) applying subsection (a) would be inconsistent with the public interest" 436(b)(1).

In implementing section 436 of the Act, the EPA must ensure that the section's requirements are applied consistent with congressional intent in adopting this section and in the broader context of the purposes, objectives, and other provisions applicable to projects funded under the SRF. Water infrastructure projects typically contain a relatively small number of high-cost components incorporated into the project. In bid solicitations for a project, these high-cost components are generally described in detail via project specific technical specifications. For these major components, utility owners and their contractors are generally familiar with the conditions of availability, the potential alternatives for each detailed specification, the approximate cost, and the country of manufacture of the available components.

Every water infrastructure project also involves the use of thousands of miscellaneous, generally low-cost components that are essential for, but incidental to, the construction and are incorporated into the physical structure of the project. For many of these incidental components, the country of manufacture and the availability of alternatives is not always readily or reasonably identifiable prior to procurement in the normal course of business; for other incidental components, the country of manufacture may be known but the miscellaneous character in conjunction with the low cost, individually and (in total) as typically procured in bulk, mark them as properly incidental. Examples of incidental components could include small washers, screws, fasteners (i.e., nuts and bolts), miscellaneous wire, corner bead, ancillary tube, etc. Examples of items that are clearly not incidental include significant process fittings (i.e., tees, elbows, flanges, and brackets), distribution system fittings and valves, force main valves, pipes for sewer collection and/or water distribution, treatment and storage tanks, large structural support structures, etc.

The EPA undertook multiple inquiries to identify the approximate scope of de minimis incidental components within water infrastructure projects during the implementation of the American Reinvestment and Recovery Act (ARRA) and its requirements (Buy American provisions, specifically). The inquiries and research conducted in 2009 applies suitably for the case today. In 2009, the EPA consulted informally with many major associations representing equipment manufacturers and suppliers, construction contractors, consulting engineers, and water and wastewater utilities, and performed targeted interviews with several well-established water infrastructure contractors and firms who work in a variety of project sizes, and regional and demographic settings to ask the following questions:

- What percentage of total project costs were consumables or incidental costs?
- What percentage of materials costs were consumables or incidental costs?
- Did these percentages vary by type of project (drinking water vs. wastewater treatment plant vs. pipe)?

The responses were consistent across the variety of settings and project types, and indicated that the percentage of total costs for drinking water or wastewater infrastructure projects represented by these incidental components is generally not in excess of 5 percent of the total cost of the materials used in and incorporated into a project. In drafting this waiver, the EPA has considered the de minimis proportion of project costs generally represented by each individual type of these incidental components within the many types of such components comprising those percentages, the fact that these types of incidental components are obtained by contractors in many different ways from many different sources, and the disproportionate cost and delay that would be imposed on projects if the EPA did not issue this waiver.

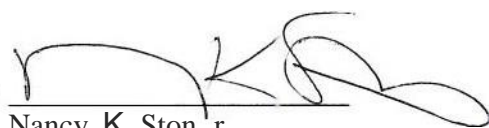
Assistance recipients who wish to use this waiver should in consultation with their contractors determine the items to be covered by this waiver and must retain relevant documentation (i.e., invoices) as to those items in their project files.

If you have any questions concerning the contents of this memorandum, please contact Timothy Connor, Chemical Engineer, Municipal Support Division, at connor.timothy@epa.gov or (202) 566-1059 or Kirsten Anderer, Environmental Engineer, Drinking Water Protection Division, at anderer.kirsten@epa.gov or (202) 564-3134.

April 5 2014

Issued on: _____

Approved by: _____

A handwritten signature in black ink, appearing to read 'Nancy K. Stoner', is written over a horizontal line.

Nancy K. Stoner
Acting Assistant Administrator

Ohio Water Pollution Control Loan Fund
Use of American Iron and Steel - De Minimis Final Utilization and Certification Form

The Consolidated Appropriations Act of 2014 (P.L. 113-76) Section 436 requires the use of American & Steel in SRF-funded projects. Under the authority of Section 436(b)(1), the EPA has issued a public interest waiver for De Minimis incidental components. The assistance recipient wishing to use this waiver should consult with their contractor(s) to maintain an itemized list of components covered under De Minimis. At the conclusion of the project, this form must be completed and retained in the assistance recipient's project files and a copy provided to DEFA. Please print clearly or type.

Project Name: _____ Loan Agrmt #: _____

NOTE: The De Minimis waiver is only applicable to the cost of materials for the entire project. Do not include other project costs (labor, installation costs, etc.) in the "Total Cost of Materials". The cost of a material must include delivery to the site and any applicable tax. Must have sufficient documentation to support all costs included in this calculation.

Funds used for de minimis incidental components cumulatively may comprise no more than a total of 5 percent of the total cost of the materials used in and incorporated into a project; the cost of an individual item may not exceed 1 percent of the total cost of the materials used in and incorporated into a project.

Total Cost of Materials: 5% Limit: 1% limit:

Manufacturer & Component Description	Part/Model #	Quantity (if applicable)	Cost per Unit (if applicable)	Component's Total Cost	How is Cost Documented?*

Use additional sheets as necessary

Total De Minimis Cost of Components:

If approaching the 5% or 1% limits, contact DEFA immediately

* Documentation must demonstrate confirmation of the components' actual costs (invoice, etc.).

Completed by:

Name: _____

Title: _____

Signature: _____

Date: _____

Prohibition on Telecommunications and Video Surveillance

§ 200.216 Prohibition on certain telecommunications and video surveillance services or equipment.

- (a) Recipients and subrecipients are prohibited from obligating or expending loan or grant funds to:
 - (1) Procure or obtain;
 - (2) Extend or renew a contract to procure or obtain; or
 - (3) Enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in [Public Law 115–232](#), section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).
 - (i) For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).
 - (ii) Telecommunications or video surveillance services provided by such entities or using such equipment.
 - (iii) Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.
- (b) In implementing the prohibition under [Public Law 115–232](#), section 889, subsection (f), paragraph (1), heads of executive agencies administering loan, grant, or subsidy programs shall prioritize available funding and technical support to assist affected businesses, institutions and organizations as is reasonably necessary for those affected entities to transition from covered communications equipment and services, to procure replacement equipment and services, and to ensure that communications service to users and customers is sustained.
- (c) See [Public Law 115–232](#), section 889 for additional information.
- (d) See also [§ 200.471](#).

Resources:

[2 CRF 200.216](#)

FAQ's: [Sec. 889 of 2019 NDAA FAQ 20201124.pdf \(performance.gov\)](#)

[Public Law 115-232, Section 889](#)

[§ 200.471](#)

SECTION 9
WAGE RATES

Davis-Bacon Wage Rate Requirements

(required contract provision)

Background and Applicability

On October 30, 2009, P.L. 111-88, "Making appropriations for the Department of the Interior, environment, and related agencies for the fiscal year ending September 30, 2010, and for other purposes," was enacted. This law provides appropriations for both the Clean Water State Revolving Fund (CWSRF) and the Drinking Water State Revolving Fund (DWSRF) for Fiscal Year 2010, while adding new requirements to these already existing programs. One new requirement requires the application of Davis-Bacon Act requirements.

Application of the Davis-Bacon Act requirements extend not only to assistance agreements funded with Fiscal Year 2010 appropriations, but to all assistance agreements executed on or after October 30, 2009, whether the source of the funding is prior year's appropriations, state match, bond proceeds, interest earnings, principal repayments, or any other source of funding so long as the project is financed by an SRF assistance agreement. If a project began construction prior to October 30, 2009 but is financed or refinanced through an assistance agreement executed on or after October 30, 2009, Davis-Bacon Act requirements will apply to all construction that occurs on or after October 30, 2009, through completion of construction.

Ohio EPA Responsibilities

With respect to the Water Pollution Control Loan Fund (WPCLF) and Water Supply Revolving Loan Account (WSRLA) revolving funds, EPA provides capitalization grants to each State which in turn provides funding assistance to eligible recipients within the State. Typically, the assistance recipients are municipal or other local governmental entities that manage the funds. Occasionally, the assistance recipients may be a private for profit or not for profit entity. Although EPA and the State are responsible for ensuring assistance recipients incorporate the wage rate requirements set forth herein as part of contracts for WPCLF and WSRLA funding, the assistance recipient has the primary responsibility to maintain payroll records and for compliance with Davis-Bacon Act requirements as described below.

Municipal Or Other Local Governmental Entities Recipient's Responsibilities

The following is intended to help assistance recipients understand and meet their obligations related to Davis-Bacon (DB). Each assistance recipients should, however, review the contract/subcontract requirements that are set forth later in this document for a more full understanding of DB obligations.

Prior to advertising for bids:

- > Obtain the wage determination for the locality in which a covered activity subject to DB will take place from the Department of Labor (DOL) at www.wdol.gov.
- > Incorporate these wage determinations into the request for bids.
- > Include the required contract provisions (see below) into the contract documents.
- > Require prime contracts to include provisions that subcontractors follow the wage determination incorporated into the prime contract.

During the advertisement period:

- > Monitor www.wdol.gov on a weekly basis to ensure that the wage determination contained in the request for bids remains current.
- > If DOL modifies the DB wage determination more than 10 days prior to the bid opening, issue an addendum reflecting the modification.
- > If DOL modifies or supersedes the DB wage determination less than 10 days prior to bid opening and you cannot issue an addendum for the change, you must request a finding from Ohio EPA that there is not reasonable time to notify interested contractors of the modification of the wage determination. The Ohio EPA will give you a report of its findings.

After opening bids:

- > If the contract(s) aren't awarded within 90 days of the bid opening you must monitor www.wdol.gov on a weekly basis to ensure that wage determinations used in the bids remain current.
- > If the contract(s) aren't awarded within 90 days of the bid opening, any modifications or supersedes that DOL makes to the wage determination must be incorporated into the contract unless (1) you request an extension from Ohio EPA AND (2) Ohio EPA obtains an extension of the 90 day period from DOL pursuant to 29 CFR 1.6(c)(3)(iv).

After contracts are signed and during construction:

- > Review all subcontracts subject to DB entered into by prime contractors to verify that the prime contractor has required its subcontractors to include the applicable wage determinations.
- > DOL may issue a revised wage determination applicable to one or all of your contracts after the award of the contract or execution of the change order which incorporated DB requirements into the contract if DOL determines that you have failed to incorporate a wage determination or have used a wage determination that clearly does not apply to the contract. If this occurs, you shall either terminate the contract or change order and rebid the contract OR incorporate DOL's wage determination retroactive to the beginning of the contract by change order. The contractor must be compensated for any increases in wages resulting from the use of DOL's revised wage determination.
- > Periodically interview a sufficient number of employees entitled to DB prevailing wages (covered employees) to verify that contractors or subcontractors are paying the appropriate wage rates. As provided in 29 CFR 5.6(a)(6), all interviews must be conducted in confidence. You must use Standard Form 1445 or equivalent documentation to memorialize the interviews.
- > Establish and follow an interview schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, you must:
 - conduct all interviews in confidence.
 - conduct interviews with a representative group of covered employees within two weeks of each contractor or subcontractor's submission of its initial weekly payroll data and two weeks prior to the estimated completion date for the contract or subcontract.
 - conduct more frequent interviews if the initial interviews or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB.
 - immediately conduct necessary interviews in response to an alleged violation of the prevailing wage requirements.
- > Periodically conduct spot checks of a representative sample of weekly payroll data to verify that contractors or subcontractors are paying the appropriate wage rates. You must:
 - establish and follow a spot check schedule based on your assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract.
 - spot check payroll data within two weeks of each contractor or subcontractor's submission of its initial payroll data and two weeks prior to the completion date the contract or subcontract at a minimum.
 - conduct more frequent spot checks if the initial spot check or other information indicates that there

is a risk that the contractor or subcontractor is not complying with DB.

- during the examinations, verify evidence of fringe benefit plans and payments thereunder by contractors and subcontractors who claim credit for fringe benefit contributions.

> Periodically review contractors' and subcontractors' use of apprentices and trainees to verify registration and certification with respect to apprenticeship and training programs approved by either the DOL or a state, as appropriate, and that contractors and subcontractors are not using disproportionate numbers of, laborers, trainees and apprentices. These reviews shall be conducted in accordance with the schedules for spot checks and interviews.

> Immediately report potential violations of the DB prevailing wage requirements to Andrew Lausted at EPA Region V at 312-886-0189 and to the appropriate DOL Wage and Hour District Office listed at <http://www.dol.gov/esa/contacts/whd/america2.htm>.

If contracts have already been signed and DB requirements need to be incorporated:

> If contracts have already been signed prior to WPCLF/WSRLA funding being provided, you must issue a change order, task order, work assignment or similar legally binding instrument and incorporate the appropriate DOL wage determination from www.wdol.gov as well as the required contract provisions into the contract(s).

> Initiate the contractor and subcontractor review and wage interview requirements as described above and provided in the **Contract And Subcontract Provisions**.

**Private For Profit Or Not For Profit (Non-Governmental) Entities
Recipient's Responsibilities**

The requirements, responsibilities and contract provisions for Private For Profit or Not For Profit Entities (Non-Governmental Entities) is exactly the same as for Municipal Or Other Local Governmental Entities EXCEPT for the following:

Prior to advertising for bids:

> Obtain the proposed wage determinations for specific localities from www.wdol.gov.

> Submit the wage determination to Ohio EPA for approval prior to inserting the wage determination into the solicitation unless subsequently directed otherwise by Ohio EPA.

Contract And Subcontract Provisions For Contracts In Excess Of \$2,000

The following language must be included in full in any contract in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a public building or public work, or building or work financed in whole or in part with WPCLF or WSRLA funds and which is subject to the labor standards provisions of any of the acts listed in §5.1:

NOTE: Modify the first sentence to include the name of the WPCLF/WSRLA funding recipient prior to including these provisions in the contract documents.

Wage Rate Requirements

As used in these provisions "subrecipient" means _____ (fill in WPCLF/WSRLA funding recipient name here).

(a) The following applies to any contract in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a public building or public

work, or building or work financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in § 5.1.

(1) Minimum wages.

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

Subrecipients may obtain wage determinations from the U.S. Department of Labor's web site, www.wdol.gov.

(ii)(A) The subrecipient(s), on behalf of EPA, shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The EPA award official shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the subrecipient(s) agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the subrecipient(s) to the State award official. The State award official will transmit the report, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department

of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the State award official or will notify the State award official within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the and the subrecipient(s) do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the award official shall refer the questions, including the views of all interested parties and the recommendation of the State award official, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account asset for the meeting of obligations under the plan or program.

(2) Withholding. The subrecipient(s), shall upon written request of the EPA Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the

plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly, for each week in which any contract work is performed, a copy of all payrolls to the subrecipient, that is, the entity that receives the subgrant or loan from the State capitalization grant recipient. Such documentation shall be available on request of the State recipient or EPA. As to each payroll copy received, the subrecipient shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on the weekly payrolls. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the subrecipient(s) for transmission to the State or EPA if requested by EPA, the State, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the subrecipient(s).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the State, EPA or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency or State may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees --

(i) *Apprentices.* Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) *Trainees.* Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe

benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

(6) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the EPA determines may be appropriate, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

(7) Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and subrecipient(s), State, EPA, the U.S. Department of Labor, or the employees or their representatives.

(10) Certification of eligibility.

(i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

Contract Provision For Contracts In Excess Of \$100,000 And Subject To The Overtime Provisions Of The Contract Work Hours And Safety Standards Act

The following language must be included in full in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These provisions are to be included in addition to the provisions for contracts in excess of \$2,000. As used in these paragraphs, the terms laborers and mechanics include watchmen and guards.

(b) Contract Work Hours and Safety Standards Act. The following applies to any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. As used in these paragraphs, the terms laborers and mechanics include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (a)(1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The subrecipient, upon written request of the EPA Award Official or an authorized representative of the Department of Labor, shall withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

Contract Provision For Contracts In Excess Of \$100,000 Subject ONLY To The Contract Work Hours And Safety Standards Act

In addition to the provisions for contracts in excess of \$2,000, for any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, you must insert clauses requiring:

(c) The following applies to any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1.

The contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid.

The records shall be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the Ohio EPA, EPA and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

Date _____

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

(1) That I pay or supervise the payment of the persons employed by _____ on the _____
(Contractor or Subcontractor)
_____ (Building or Work); that during the payroll period commencing on the _____ day of _____, _____, and ending the _____ day of _____, _____, all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said _____

_____ (Contractor or Subcontractor) _____ from the full weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Stat. 108, 72 Stat. 967, 76 Stat. 357; 40 U.S.C. § 3145), and described below:

DB. 12

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

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

(4) That:
(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

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

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

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

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS:

NAME AND TITLE	SIGNATURE
THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE 31 OF THE UNITED STATES CODE.	

How to Correctly Fill Out a WH-347 Payroll Form

The completion of the WH-347 Payroll Form is optional; contractors may utilize their own payroll system as long as it conforms to the WH-347 Payroll Form and contains all the necessary information. If you utilize WH-347 Payroll Form as a pdf, saving it electronically aids in making any needed corrections.

U.S. Department of Labor
Employment Standards Administration
Wage and Hour Division

PAYROLL
(For Contractor's Optional Use; See Instructions at www.dol.gov/esa/whd/forms/wh347instr.htm)
Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number.

NAME OF CONTRACTOR ☐ OR SUBCONTRACTOR ☐ Sample Construction Company

ADDRESS 385 West Drive, Madison WI 53703

OMB No.: 1215-0149
Expires: 12/31/2011

PAYROLL NO. 8

PROJECT AND LOCATION Robin Street Apartments, Delafield WI 53018

PROJECT OR CONTRACT NO. 3000

FOR WEEK ENDING 04/24/2010

(1) NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER) OF WORKER	(2) EMPLOYMENT CLASSIFICATION (e.g., POWER LINES, CONSTRUCTION)	(4) DAY AND DATE							(5) TOTAL HOURS	(6) RATE OF PAY	(7) GROSS AMOUNT EARNED	(8) DEDUCTIONS			(9) NET WAGES PAID FOR WEEK	
		Sun	Mon	Tue	Wed	Thurs	Frid	Sat				WITH- HOLDING TAX	State with- holding tax	Medicare		OTHER DEDUCTIONS
Alex Driver - ####	Power Equipment Bull Dozer Operator								2.00	\$62.83	\$1,422.84	\$161.00	\$185.15	\$50.31	\$85.00	\$2,434.43
									27.50	\$1,320.13	\$2,012.46					

Check one of the boxes and list name of contractor or subcontractor

The last day of the payroll period.

Fill out completely with contractor or subcontractor address

The prime contractor should include the project number as listed in the loan

The name and location of project.

Indicate the days and dates of the pay period. (should match week ending directly above)

Payrolls must be numbered sequentially and should be based on the weeks worked under a contract.

Type the word "Final" when the last payroll is submitted for the project.

List each worker's name.

Only laborers and mechanics performing construction work under the contract should be listed.

Please note: Business Owners need only include their name, work classification including "owner" and the daily total hours worked.

Specify the job classification located in the contract wage decision and/or the corresponding job title.

List hourly wage rate and fringes paid in cash (not those paid to plans)

(For Contractor's Optional Use) See instructions at www.dol.gov/esa/whd/forms/wh347instr.htm

Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number.



Specify the net amount paid to the employee for the pay

Specify the total overtime and straight time hours worked on the project.

Must accurately reflect overtime and straight time hours worked under the contract.

Specify the gross earnings for the hours worked under the contract.

Firm Name		Address		City		State		Zip		Project or Contract Number	
Jan Company		385 West Drive, Madison WI 53703		Delafield WI		53018		3000			
FOR WEEK ENDING		04/24/2010									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)			
NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER OF WORKER)	WORK CLASSIFICATION	DATE	TIME	TOTAL HOURS	RATE OF PAY	GROSS AMOUNT EARNED	DEDUCTIONS	NET AMOUNT PAID TO EMPLOYEE			
Alex Driver - ####	Power Equipment Operator Group 2	04/24/2010	8:00 - 5:00	2.00	\$62.83	\$125.66	\$161.00	\$1,374.03			
Jason Worker - ####	General Laborer	04/24/2010	8:00 - 5:00	27.50	\$13.20	\$363.00	\$136.06	\$1,233.07			
Shawn Worker - ####	Carpenter	04/24/2010	8:00 - 5:00	4.00	\$60.19	\$240.76	\$136.06	\$1,406.18			
	Apprentice Carpenter 1st 6 mo. at 40%	04/24/2010	8:00 - 5:00	1.50	\$32.72	\$49.08	\$136.06	\$757.01			
Roy Wrench - ####	Plumber	04/24/2010	8:00 - 5:00	40.00	\$16.78	\$671.20	\$136.06	\$1,563.04			
	Steamfitter	04/24/2010	8:00 - 5:00	20.00	\$34.41	\$688.20	\$136.06	\$1,023.27			
Bart Turner - ####	Power Equipment Operator Group 4	04/24/2010	8:00 - 5:00	24.00	\$60.80	\$1,459.20	\$136.06	\$1,563.04			

While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to furnish weekly a statement with respect to the wages paid each worker on such contracts. Contractors and subcontractors performing work on Federally financed or assisted construction contracts to furnish weekly a statement with respect to the wages paid each worker on such contracts. Contractors and subcontractors performing work on Federally financed or assisted construction contracts to furnish weekly a statement with respect to the wages paid each worker on such contracts. Contractors and subcontractors performing work on Federally financed or assisted construction contracts to furnish weekly a statement with respect to the wages paid each worker on such contracts.

Public Burden Statement

If part of a worker's weekly wage was earned on projects other than the project described on this payroll, enter the gross amount earned on this contract in the top half of column 7. Enter the gross amount earned during the week for all projects in the bottom half.

Alex Driver worked 29.5 hours on this contract and 12.5 hours on another contract.
The gross wages earned on this project, \$1,422.84, is entered in the top half of column 7.
The gross wages earned on all projects, \$2,012.46, is entered in the

(1) NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER) OF WORKER	(2) NO. OF WITHHOLDING EXEMPTIONS	(3) WORK CLASSIFICATION	(4) DAY AND DATE							DEDUCTIONS							(9) NET WAGES PAID FOR WEEK		
			Sun 18	Mon 19	Tue 20	Wed 21	Thurs 22	Fri 23	Sat 24	TOTAL HOURS	RATE OF PAY	GROSS AMOUNT EARNED	FICA	WITH- HOLDING TAX	State with- holding tax	Medicare		OTHER	TOTAL DEDUCTIONS
Alex Driver - #####	2	Power Equipment Bull Dozer Group 2							2.00	\$62.83	\$1,422.84	\$85.15	\$185.15	\$156.97	\$50.31	\$85.00	\$638.43	\$1,374.03	
Jason Worker - #####	2	General Laborer							4.00	\$40.70	\$1,700.78	\$35.06	\$156.47	\$132.66	\$42.52		\$467.71	\$1,233.07	
Sharon Wood - #####	3	Carpenter							40.00	\$60.19	\$1,887.49	\$151.00	\$154.77	\$128.35	\$47.19		\$481.31	\$1,406.18	
Reggie Tree - #####	1	Apprentice Carpenter 1st 6 mo. at 40%							40.00	\$32.72	\$1,064.72	\$85.18	\$105.41	\$90.50	\$26.62		\$307.71	\$757.01	
Roy Wrench - #####	5	Plumber								\$67.88	\$1,004.80								
Roy Wrench - #####	5	Steamfitter							20.00	\$69.13	\$1,038.40	\$163.46	\$147.11	\$118.51	\$51.08		\$480.16	\$1,563.04	
Bart Turner - #####	1	Power Equipment Rotary Drill Group 4							24.00	\$60.80	\$719.28	\$115.41	\$142.48	\$122.33	\$35.98		\$415.53	\$1,023.27	

If an employee performs multiple work

If an employee performs multiple work classifications under the contract, use two or more lines to distinguish the different job classifications, hours worked, and hourly wage earned for each.

Combine the two classifications when recording the gross amount earned for this pay period, deductions, and net wages.

A registered apprentice performing work under a contract must be reported. The payroll must include the current pay scale & provide a copy of the apprenticeship agreement.

Provide explanation of "other" deductions on signatory page.



PAYROLL

Optional Use; See Instructions at www.dol.gov/esa/whd/forms/wh347
 used to respond to the collection of information unless it displays a currently valid OMB control number.

Division 108
 Date: 5-01-49
 Date: 5/1/2011

ADDRESS 385 West Drive, Madison WI 53703

PROJECT OR CONTRACT NO. 3000

PROJECT AND LOCATION
 Robin Street Apartments, Delafield WI 53018

4/1/24/2010

(1) NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER OF WORKER)	(2) EMPLOYMENT CLASSIFICATION	(3) WORK CLASSIFICATION	(4) DAY AND DATE							(5) TOTAL HOURS	(6) RATE OF PAY	(7) GROSS AMOUNT EARNED	(8) DEDUCTIONS			(9) NET WAGES PAID FOR WEEK
			Sun	Mon	Tue	Wed	Thur	Frid	Sat				WITH- HOLDING TAX	FICA	OTHER	
			18	19	20	21	22	23	24				State with holding tax	Medicare	Other	
Alex Driver - #####	2	Power Equipment Bull Dozer Group 2								2.00	\$62.83	\$1,422.84	\$185.15	\$161.00	\$85.00	\$1,374.03
Jason Worker - #####	4	General Laborer								4.00	\$49.20	\$2,012.46	\$156.97	\$136.06	\$50.31	\$1,779.13
Sharon Wood - #####	3	Carpenter								40.00	\$60.19	\$2,407.60	\$128.35	\$151.00	\$47.19	\$2,181.06
Reggie Tree - #####	1	Apprentice Carpenter 1st 6 mo. at 40%								40.00	\$32.72	\$1,308.80	\$90.50	\$85.18	\$26.62	\$1,107.10
Roy Wrench - #####	5	Plumber								20.00	\$67.88	\$1,357.60				\$1,357.60
Roy Wrench - #####	5	Steamfitter								20.00	\$69.13	\$1,382.60	\$147.11	\$163.46	\$51.08	\$1,061.95
Bart Turner - #####	1	Power Equipment Rotary Drill Group 4								24.00	\$60.80	\$1,459.20	\$142.48	\$115.14	\$35.98	\$1,265.60

Fringe benefits are not paid as cash to Bart Turner: explanation is included under "(c) exceptions" on signatory page.

While completion of Form WH-347 is required by the Department of Labor, 29 C.F.R. § 3145, contractors are not required to provide any comments regarding these instructions to the Department of Labor, 29 C.F.R. § 5.5(a)(3)(i) if the contractor has been paid or mechanic has been paid.

Declaratory Statement

We estimate that is will take _____ hours, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information, if you have any comments regarding these instructions to early, at a point in the collection, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, ESA, U.S. Department of Labor, Room S3502, 200 Constitution Avenue, N.W., Washington, D.C. 20210

(over)

Date 04/28/2010
I, Tiffany Payer Payroll Supervisor
(Name of Signatory Party) (Title)
do hereby state:

(1) That I pay or supervise the payment of the persons employed by
Sample Construction Company
(Contractor or Subcontractor) on the
Robin Street Apartments, Delafield WA; that during the payroll period commencing on the
18 day of 4, 2010 and ending the 24 day of 4, 2010
all persons employed on said project have been paid the full weekly wages earned, that no rebates have
been or will be made either directly or indirectly to or on behalf of said
Sample Construction Company
(Contractor or Subcontractor) from the full
weekly wages earned by any person and that no deductions have been made either directly or indirectly
from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part
3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 940,
63 Stat. 108, 72 Stat. 907, 76 Stat. 357; 40 U.S.C. § 3145), and described below:

Alex Driver - #### - other deductions - \$85 for child support

Explanation of "other"

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

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

(4) That:
(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS
☐ - In addition to the basic hourly wage rates paid to each laborer or mechanic listed in
the above referenced payroll, payments of fringe benefits as listed in the contract
have been or will be made to appropriate programs for the benefit of such
employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

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

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION
Power Equipment Rotary Drill Group 4	paid directly to plan: health & dental at \$12.50 per hour and Pension at \$6.25 per hour

Explanation of
exception to
fringe benefits

REMARKS:

NAME AND TITLE Robert Sample, Owner	SIGNATURE
THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE 31 OF THE UNITED STATES CODE.	

CONTRACTOR FRINGE BENEFIT STATEMENT

Contract # /Project Name:	Contract Location:	Today's Date:
Contractor / Subcontractor Name:		Business Address:

In order that the proper Fringe Benefit rates can be verified when checking payrolls on the above contract, the hourly rates for fringe benefits, subsistence and/or travel allowance payment made for employees by the employer on the various classes of work are tabulated below. **Please Include Apprentice Rates.**

Classification:		Effective Date:	Subsistence or Travel Pay: \$ _____
EMPLOYER PAID FRINGE BENEFITS	Health & Welfare \$ _____ hr	Paid To: Name of Plan/Fund/Program: Address:	_____
	Pension \$ _____ hr	Paid To: Name of Plan/Fund/Program: Address:	_____
	Vacation/Holiday \$ _____ hr	Paid To: Name of Plan/Fund/Program: Address:	_____
	Training \$ _____ hr	Paid To: Name of Plan/Fund/Program: Address:	_____
	Other \$ _____ hr	Paid To: Name of Plan/Fund/Program: Address:	_____

Classification:		Effective Date:	Subsistence or Travel Pay: \$ _____
EMPLOYER PAID FRINGE BENEFITS	Health & Welfare \$ _____ hr	Paid To: Name of Plan/Fund/Program: Address:	_____
	Pension \$ _____ hr	Paid To: Name of Plan/Fund/Program: Address:	_____
	Vacation/Holiday \$ _____ hr	Paid To: Name of Plan/Fund/Program: Address:	_____
	Training \$ _____ hr	Paid To: Name of Plan/Fund/Program: Address:	_____
	Other \$ _____ hr	Paid To: Name of Plan/Fund/Program: Address:	_____

Supplemental statements must be submitted during the progress of the work should there be an increase or change in rates. Use additional sheets as necessary. (Attach a copy of your most recent premium transmittal (including copy of check submitted) into each of the above plans/funds/programs or a letter from the above plans/funds/programs reflecting current payment status).

I certify under penalty of perjury that fringe benefits are paid to the approved plans, funds or programs as listed above.

Name and Title	Signature and Date (Wet Signature Required)
_____	_____

PREVAILING WAGE NOTIFICATION TO EMPLOYEE

Project Name:		Job Number:	
Contractor:			
Project Location:			
Jobsite posting of prevailing wage rates located:			
Prevailing Wage Coordinator		Employee	
Name:		Name:	
Street:		Street:	
City:		City:	
State / Zip:		State / Zip:	
Phone:		Phone:	
<p>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.</p>			
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:

whpw1512

"General Decision Number: OH20250001 05/16/2025

Superseded General Decision Number: OH20240001

State: Ohio

Construction Types: Heavy and Highway

Counties: Ohio Statewide.

Heavy and Highway Construction Projects

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	<ul style="list-style-type: none"> . Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$17.75 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	<ul style="list-style-type: none"> . Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2025.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number	Publication Date
0	01/03/2025
1	02/07/2025
2	02/14/2025

3	02/28/2025
4	03/07/2025
5	03/14/2025
6	04/25/2025
7	05/02/2025
8	05/09/2025
9	05/16/2025

BROH0001-001 06/01/2024

DEFIANCE, FULTON (Excluding Fulton, Amboy & Swan Creek Townships), HENRY (Excluding Monroe, Bartlow, Liberty, Washington, Richfield, Marion, Damascus & Townships & that part of Harrison Township outside corporate limits of city of Napoleon), PAULDING, PUTNAM and WILLIAMS COUNTIES

	Rates	Fringes
Bricklayer, Stonemason.....	\$ 33.39	20.06

BROH0001-004 06/01/2023		

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 32.40	19.30

BROH0003-002 06/01/2024		

FULTON (Townships of Amboy, Swan Creek & Fulton), HENRY (Townships of Washington, Damascus, Richfield, Bartlow, Liberty, Harrison, Monroe, & Marion), LUCAS and WOOD (Townships of Perrysburg, Ross, Lake, Troy, Freedom, Montgomery, Webster, Center, Portage, Middleton, Plain, Liberty, Henry, Washington, Weston, Milton, Jackson & Grand Rapids) COUNTIES

	Rates	Fringes
Bricklayer, Stonemason.....	\$ 33.39	20.06

BROH0005-003 06/01/2020		

CUYAHOGA, LORAIN & MEDINA (Hinckley, Granger, Brunswick, Liverpool, Montville, York, Homer, Harrisville, Chatham, Litchfield & Spencer Townships and the city of Medina)

	Rates	Fringes
BRICKLAYER		
BRICKLAYERS; CAULKERS;		
CLEANERS; POINTERS; &		
STONEMASONS.....	\$ 36.64	17.13
SANDBLASTERS.....	\$ 36.39	17.13
SEWER BRICKLAYERS & STACK		
BUILDERS.....	\$ 36.64	17.13
SWING SCAFFOLDS.....	\$ 37.14	17.13

BROH0006-005 06/01/2024		

CARROLL, COLUMBIANA (Knox, Butler, West & Hanover Townships), STARK & TUSCARAWAS

Rates	Fringes
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Bricklayer, Stonemason.....\$ 33.39	20.06
-------------------------------------	-------

BROH0007-002 06/01/2024

LAWRENCE

Rates	Fringes
-------	---------

Bricklayer, Stonemason.....\$ 33.39	20.06
-------------------------------------	-------

BROH0007-005 06/01/2023

PORTAGE & SUMMIT

Rates	Fringes
-------	---------

BRICKLAYER.....\$ 32.40	19.30
-------------------------	-------

BROH0007-010 06/01/2024

PORTAGE & SUMMIT

Rates	Fringes
-------	---------

MASON - STONE.....\$ 33.39	20.06
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BROH0008-001 06/01/2024

COLUMBIANA (Salem, Perry, Fairfield, Center, Elk Run,
Middleton, & Unity Townships and the city of New Waterford),
MAHONING & TRUMBULL

Rates	Fringes
-------	---------

BRICKLAYER.....\$ 33.39	20.06
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BROH0009-002 06/01/2024

BELMONT & MONROE COUNTIES and the Townships of Warren & Mt.
Pleasant and the Village of Dillonvale in JEFFERSON COUNTY

Rates	Fringes
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Bricklayer, Stonemason.....\$ 33.39	20.06
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Refractory.....\$ 31.45	19.01
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BROH0010-002 06/01/2024

COLUMBIANA (St. Clair, Madison, Wayne, Franklin, Washington,
Yellow Creek & Liverpool Townships) & JEFFERSON (Brush Creek &
Saline Townships)

Rates	Fringes
-------	---------

Bricklayer, Stonemason.....\$ 33.39	20.06
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BROH0014-002 06/01/2024

HARRISON & JEFFERSON (Except Mt. Pleasant, Warren, Brush Creek,
Saline & Salineville Townships & the Village of Dillonvale)

	Rates	Fringes
Bricklayer, Stonemason.....	\$ 33.39	20.06

BROH0016-002 06/01/2023		

ASHTABULA, GEAUGA, and LAKE COUNTIES

	Rates	Fringes
Bricklayer, Stonemason.....	\$ 32.40	19.30

BROH0018-002 06/01/2024		

BROWN, BUTLER, CLERMONT, HAMILTON, PREBLE (Gasper, Dixon, Israel, Lanier, Somers & Gratis Townships) & WARREN COUNTIES:

	Rates	Fringes
Bricklayer, Stonemason.....	\$ 33.39	20.06

BROH0022-004 06/01/2024		

CHAMPAIGN, CLARK, CLINTON, DARKE, GREENE, HIGHLAND, LOGAN, MIAMI, MONTGOMERY, PREBLE (Jackson, Monroe, Harrison, Twin, Jefferson & Washington Townships) and SHELBY COUNTIES

	Rates	Fringes
Bricklayer, Stonemason.....	\$ 33.39	20.06

BROH0032-001 06/01/2024		

GALLIA & MEIGS

	Rates	Fringes
Bricklayer, Stonemason.....	\$ 33.39	20.06

BROH0035-002 06/01/2024		

ALLEN, AUGLAIZE, MERCER and VAN WERT COUNTIES

	Rates	Fringes
Bricklayer, Stonemason.....	\$ 33.39	20.06

BROH0039-002 06/01/2024		

ADAMS & SCIOTO

	Rates	Fringes
Bricklayer, Stonemason.....	\$ 33.39	20.06

BROH0040-003 06/01/2024		

ASHLAND, CRAWFORD, HARDIN, HOLMES, MARION, MORROW, RICHLAND, WAYNE and WYANDOT (Except Crawford, Ridge, Richland & Tymochtee Townships) COUNTIES

	Rates	Fringes
Bricklayer, Stonemason.....	\$ 33.39	20.06

FOOTNOTE: Layout Man and Sawman rate: \$1.00 per hour above journeyman rate.
 Free standing stack work ground level to top of stack;
 Sandblasting and laying of carbon masonry material in swing stage and/or scaffold; Ramming and spading of plastics and gunniting: \$1.50 per hour above journeyman rate.
 ""Hot"" work: \$2.50 above journeyman rate.

 BROH0044-002 06/01/2024

	Rates	Fringes
Bricklayer, Stonemason COSHOCTON, FAIRFIELD, GUERNSEY, HOCKING, KNOX, KICKING, MORGAN, MUSKINGUM, NOBLE (Beaver, Buffalo, Seneca & Wayne Townships) & PERRY COUNTIES:.....	\$ 33.39	20.06

 BROH0045-002 06/01/2023

FAYETTE, JACKSON, PIKE, ROSS and VINTON COUNTIES

	Rates	Fringes
Bricklayer, Stonemason.....	\$ 35.39	17.47

 BROH0046-002 06/01/2024

ERIE, HANCOCK, HURON, OTTAWA, SANDUSKY, SENECA, WOOD (Perry & Bloom Townships) and WYANDOT (Tymochtee, Crawford, Ridge & Richland Townships) COUNTIES & the Islands of Lake Erie north of Sandusky

	Rates	Fringes
Bricklayer, Stonemason.....	\$ 33.39	20.06

FOOTNOTE: Layout Man and Sawman rate: \$1.00 per hour above journeyman rate.
 Free standing stack work ground level to top of stack;
 Sandblasting and laying of carbon masonry material in swing stage and/or scaffold; Ramming and spading of plastics and gunniting: \$1.50 per hour above journeyman rate.
 ""Hot"" work: \$2.50 above journeyman rate.

 BROH0052-001 06/01/2024

ATHENS COUNTY

	Rates	Fringes
Bricklayer, Stonemason.....	\$ 33.39	20.06

 BROH0052-003 06/01/2024

NOBLE (Brookfield, Noble, Center, Sharon, Olive, Enoch, Stock, Jackson, Jefferson & Elk Townships) and WASHINGTON COUNTIES

	Rates	Fringes
Bricklayer, Stonemason.....	\$ 33.39	20.06

BROH0055-003 06/01/2024

DELAWARE, FRANKLIN, MADISON, PICKAWAY and UNION COUNTIES

	Rates	Fringes
Bricklayer, Stonemason.....	\$ 33.39	20.06

* CARP0002-024 05/01/2017

BROWN, BUTLER, CHAMPAIGN, CLARK, CLERMONT, CLINTON, DARKE, GREENE, HAMILTON, LOGAN, MIAMI, MONTGOMERY, PREBLE, SHELBY & WARREN

	Rates	Fringes
Carpenter & Piledrivermen.....	\$ 29.34	15.95
Diver.....	\$ 40.58	9.69

CARP0171-001 05/01/2025

MAHONING & TRUMBULL

	Rates	Fringes
CARPENTER.....	\$ 33.19	25.02

CARP0171-002 05/01/2025

BELMONT, COLUMBIANA, HARRISON, JEFFERSON & MONROE

	Rates	Fringes
CARPENTER.....	\$ 32.50	26.19

CARP0200-002 05/01/2024

ADAMS, ATHENS, DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, GALLIA, GUERNSEY, HIGHLAND, HOCKING, JACKSON, LAWRENCE, LICKING, MADISON, MARION, MEIGS, MORGAN, MUSKINGUM, NOBLE, PERRY, PICKAWAY, PIKE, ROSS, SCIOTO, UNION, VINTON and WASHINGTON COUNTIES

	Rates	Fringes
CARPENTER.....	\$ 33.15	22.43
Diver.....	\$ 39.41	10.40
PILEDRIVERMAN.....	\$ 33.15	22.43

CARP0285-001 05/01/2025

CARROLL, STARK, TUSCARAWAS and WAYNE

	Rates	Fringes
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CARPENTER.....\$ 34.07 24.28

CARP0285-002 05/01/2025

COSHOCTON, HOLMES, KNOX & MORROW

Rates Fringes

CARPENTER.....\$ 33.38 24.69

CARP0285-008 05/01/2025

MEDINA, PORTAGE & SUMMIT

Rates Fringes

CARPENTER.....\$ 37.18 25.07

CARP0351-005 05/01/2025

LUCAS & WOOD

Rates Fringes

CARPENTER.....\$ 35.44 27.56

CARP0351-006 05/01/2025

Rates Fringes

CARPENTER
DEFIANCE, FULTON, HANCOCK,
HENRY, PAULDING & WILLIAMS
COUNTIES.....\$ 32.05 26.13

* CARP0372-002 05/01/2025

ALLEN, AUGLAIZE, HARDIN, MERCER, PUTNAM & VAN WERT

Rates Fringes

CARPENTER.....\$ 31.80 26.33

CARP0435-005 05/01/2025

ASHTABULA, CUYAHOGA, GEAUGA & LAKE

Rates Fringes

CARPENTER.....\$ 38.57 24.64

* CARP0735-001 05/01/2025

ASHLAND, HURON & RICHLAND

Rates Fringes

CARPENTER.....\$ 34.67 23.57

* CARP0735-002 05/01/2025

LORAIN

Rates Fringes

CARPENTER.....\$ 38.42 24.01

* CARP0735-004 05/01/2025

ERIE

Rates Fringes

CARPENTER.....\$ 36.71 24.14

* CARP0744-001 05/01/2025

CRAWFORD, OTTAWA, SANDUSKY, SENECA & WYANDOT

Rates Fringes

CARPENTER.....\$ 33.74 27.05

CARP1090-002 05/01/2025

ALLEN, AUGLAIZE, HARDIN, MERCER, PUTNAM, VAN WERT & WYANDOT

Rates Fringes

Piledrivermen & Diver's Tender...\$ 35.94 28.39

DIVERS - \$250.00 per day

CARP1090-003 05/01/2025

BELMONT, HARRISON, & MONROE

Rates Fringes

Diver, Wet.....\$ 58.52 24.91

Piledrivermen; Diver, Dry.....\$ 39.01 24.91

CARP1090-004 05/01/2025

CARROLL, STARK, TUSCARAWAS & WAYNE

Rates Fringes

Diver, Wet.....\$ 49.82 25.40

Piledrivermen; Diver, Dry.....\$ 33.21 25.40

* CARP1090-005 05/01/2025

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

Rates Fringes

Diver, Wet.....\$ 54.51 27.50

Piledrivermen; Diver, Dry.....\$ 36.34 27.50

CARP1090-006 05/01/2025

COSHOCTON, HOLMES, KNOX & MORROW

Rates Fringes

Diver, Wet.....\$ 54.36 22.54

Piledrivermen; Diver, Dry.....	\$ 36.24	22.54
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CARP1090-007 05/01/2025

MAHONING & TRUMBULL

	Rates	Fringes
Diver, Wet.....	\$ 50.85	24.82
Piledrivermen; Diver, Dry.....	\$ 33.90	24.82

CARP1090-008 05/01/2025

COLUMBIANA & JEFFERSON

	Rates	Fringes
PILEDRIVERMAN.....	\$ 39.01	24.91

CARP1090-009 05/01/2025

CRAWFORD, DEFIANCE, FULTON, HANCOCK, HENRY, LUCAS, OTTAWA,
PAULDING, SANDUSKY, SENECA, WILLIAMS & WOOD

	Rates	Fringes
Piledrivermen & Diver's Tender...	\$ 37.98	28.63

DIVERS - \$250.00 per day

ELEC0008-002 05/27/2024

DEFIANCE, FULTON, HANCOCK, HENRY, LUCAS, OTTAWA, PAULDING,
PUTNAM, SANDUSKY, SENECA, WILLIAMS & WOOD

	Rates	Fringes
CABLE SPLICER.....	\$ 38.98	18.96
ELECTRICIAN.....	\$ 48.40	4.5%+23.06

ELEC0032-003 12/02/2024

ALLEN, AUGLAIZE, HARDIN, LOGAN, MERCER, SHELBY, VAN WERT &
WYANDOT (Crawford, Jackson, Marseilles, Mifflin, Ridgeland,
Ridge & Salem Townships)

	Rates	Fringes
ELECTRICIAN.....	\$ 39.17	23.45

ELEC0038-002 04/29/2024

CUYAHOGA, GEAUGA (Bainbridge, Chester & Russell Townships) &
LORAIN (Columbia Township)

	Rates	Fringes
ELECTRICIAN Excluding Sound & Communications Work.....	\$ 45.23	23.88

FOOTNOTES;

- a. 6 Paid Holidays: New Year's Day; Memorial Day; July 4th; Labor Day; Thanksgiving Day; & Christmas Day
- b. 1 week's paid vacation for 1 year's service; 2 weeks' paid vacation for 2 or more years' service

ELEC0038-008 04/29/2024

CUYAHOGA, GEAUGA (Bainbridge, Chester & Russell Townships) & LORAIN (Columbia Township)

	Rates	Fringes
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Sound & Communication
Technician

Communications Technician...	\$ 32.30	14.38
Installer Technician.....	\$ 31.05	14.34

FOOTNOTES;

- a. 6 Paid Holidays: New Year's Day; Memorial Day; July 4th; Labor Day; Thanksgiving Day; & Christmas Day
- b. 1 week's paid vacation for 1 year's service; 2 weeks' paid vacation for 2 or more years' service

ELEC0064-003 11/25/2024

COLUMBIANA (Butler, Fairfield, Perry, Salem & Unity Townships)
MAHONING (Austintown, Beaver, Berlin, Boardman, Canfield, Ellsworth, Coitsville, Goshen, Green, Jackson, Poland, Springfield & Youngstown Townships), & TRUMBULL (Hubbard & Liberty Townships)

	Rates	Fringes
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ELECTRICIAN.....	\$ 39.80	21.03
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ELEC0071-005 01/06/2025

ASHTABULA, CUYAHOGA, GEAUGA, LAKE & LORAIN

	Rates	Fringes
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LINE CONSTRUCTION: Equipment
Operator

DOT/Traffic Signal & Highway Lighting Projects...	\$ 39.97	27%+8.00
Municipal Power/Transit Projects.....	\$ 49.46	27%+8.25

LINE CONSTRUCTION: Groundman

DOT/Traffic Signal & Highway Lighting Projects...	\$ 31.10	27%+8.00
Municipal Power/Transit Projects.....	\$ 38.47	27%+8.25

LINE CONSTRUCTION:

Linemen/Cable Splicer

DOT/Traffic Signal & Highway Lighting Projects...	\$ 43.89	27%+8.00
Municipal Power/Transit Projects.....	\$ 54.96	27%+8.25

ELEC0071-010 01/06/2025

Statewide

	Rates	Fringes
Line Construction		
Equipment Operator.....	\$ 40.44	4%+16.09
Groundman.....	\$ 29.07	4%+13.81
Lineman & Cable Splicers....	\$ 46.02	4%+17.20

ELEC0082-002 12/02/2024

CLINTON, DARKE, GREENE, MIAMI, MONTGOMERY, PREBLE & WARREN
(Wayne, Clear Creek & Franklin Townships)

	Rates	Fringes
ELECTRICIAN.....	\$ 38.00	22.49

* ELEC0082-006 11/25/2024

CLINTON, DARKE, GREENE, MIAMI, MONTGOMERY, PREBLE & WARREN
(Wayne, Clear Creek & Franklin Townships)

	Rates	Fringes
Sound & Communication Technician		
Cable Puller.....	\$ 13.85 **	5.30
Installer/Technician.....	\$ 27.70	15.71

ELEC0129-003 02/24/2025

LORAIN (Except Columbia Township) & MEDINA (Litchfield & Liverpool Townships)

	Rates	Fringes
ELECTRICIAN.....	\$ 42.95	18.81

ELEC0129-004 02/24/2025

ERIE & HURON (Lyme, Ridgefield, Norwalk, Townsend, Wakeman,
Sherman, Peru, Bronson, Hartland, Clarksfield, Norwich,
Greenfield, Fairfield, Fitchville & New London Townships)

	Rates	Fringes
ELECTRICIAN.....	\$ 42.95	18.81

ELEC0141-003 06/02/2024

BELMONT COUNTY

	Rates	Fringes
CABLE SPLICER.....	\$ 42.94	27.74
ELECTRICIAN.....	\$ 39.04	27.62

ELEC0212-003 11/26/2018

BROWN, CLERMONT & HAMILTON

	Rates	Fringes
Sound & Communication Technician.....	\$ 24.35	10.99

ELEC0212-005 06/03/2024

BROWN, CLERMONT, and HAMILTON COUNTIES

	Rates	Fringes
ELECTRICIAN.....	\$ 35.43	22.05

ELEC0245-001 08/26/2024

ALLEN, HARDIN, VAN WERT & WYANDOT (Crawford, Jackson, Marseilles, Mifflin, Richland, Ridge & Salem Townships)

	Rates	Fringes
Line Construction		
Equipment Operator.....	\$ 32.95	28%+7.85
Groundman Truck Driver.....	\$ 20.59	28%+7.85
Lineman.....	\$ 47.07	28%+7.85

FOOTNOTE: a. Half day's Paid Holiday: The last 4 hours of the workday prior to Christmas or New Year's Day

ELEC0245-003 01/01/2025

DEFIANCE, FULTON, HANCOCK, HENRY, HURON, LUCAS, OTTAWA, PAULDING, PUTNAM, SANDUSKY, SENECA, WILLIAMS, and WOOD COUNTIES

	Rates	Fringes
Line Construction		
Cable Splicer.....	\$ 53.90	8.10+28%
Groundman/Truck Driver.....	\$ 20.51	8.10+28%
Heli-arc Welding.....	\$ 47.17	8.10+28%
Lineman.....	\$ 46.87	8.10+28%
Operator - Class 1.....	\$ 37.50	8.10+28%
Operator - Class 2.....	\$ 32.81	8.10+28%
Traffic Signal & Lighting Technician.....	\$ 42.18	8.10+28%

FOOTNOTE: a. 6 Observed Holidays: New Year's Day; Memorial Day; Independence Day; Labor Day; Thanksgiving Day; & Christmas Day. Employees who work on a holiday shall be paid at a rate of double their applicable classified straight-time rates for the work performed on such holiday.

ELEC0245-004 01/01/2025

ERIE COUNTY

	Rates	Fringes
Line Construction		
Cable Splicer.....	\$ 49.14	26.75%+6.75

Cablesplicer.....	\$ 53.90	28%+8.10
Groundman/Truck Driver.....	\$ 20.51	28%+8.10
Lineman.....	\$ 46.87	28%+8.10
Operator - Class 1.....	\$ 37.50	28%+8.10
Operator - Class 2.....	\$ 32.81	28%+8.10

FOOTNOTE: a. 6 Observed Holidays: New Year's Day; Memorial Day; Independence Day; Labor Day; Thanksgiving Day; & Christmas Day. Employees who work on a holiday shall be paid at a rate of double their applicable classified straight-time rates for the work performed on such holiday.

ELEC0246-001 10/28/2024

	Rates	Fringes
ELECTRICIAN.....	\$ 44.00	30.38%+24.31

FOOTNOTE: a. 1 1/2 Paid Holidays: The last scheduled workday prior to Christmas & 4 hours on Good Friday.

ELEC0306-005 05/27/2024

MEDINA (Brunswick, Chatham, Granger, Guilford, Harrisville, Hinckley, Homer, Lafayette, Medina, Montville, Sharon, Spencer, Wadsworth, Westfield & York Townships), PORTAGE (Atwater, Aurora, Brimfield, Deerfield, Franklin, Mantua, Randolph, Ravenna, Rootstown, Shalersville, Streetsboro & Suffield Townships), SUMMIT & WAYNE (Baughman, Canaan, Chester, Chippewa, Congress, Green, Milton, & Wayne Townships)

	Rates	Fringes
CABLE SPLICER.....	\$ 46.81	20.95
ELECTRICIAN.....	\$ 42.55	20.95

ELEC0317-002 05/29/2023

GALLIA & LAWRENCE

	Rates	Fringes
CABLE SPLICER.....	\$ 32.68	18.13
ELECTRICIAN.....	\$ 37.15	28.48

ELEC0540-005 01/01/2024

CARROLL (Northern half, including Fox, Harrison, Rose & Washington Townships), COLUMBIANA (Knox Township), HOLMES, MAHONING (Smith Township), STARK, TUSCARAWAS (North of Auburn, Clay, Rush & York Townships), and WAYNE (South of Baughman, Chester, Green & Wayne Townships) COUNTIES

	Rates	Fringes
ELECTRICIAN.....	\$ 36.96	28.18

ELEC0573-003 11/25/2024

ASHTABULA (Colebrook, Wayne, Williamsfield, Orwell & Windsor Townships), GEAUGA (Auburn, Middlefield, Parkman & Troy

Townships), MAHONING (Milton Township), PORTAGE (Charlestown, Edinburg, Freedom, Hiram, Nelson, Palmyra, Paris & Windham Townships), and TRUMBULL (Except Liberty & Hubbard Townships)

	Rates	Fringes
ELECTRICIAN.....	\$ 42.20	23.20

ELEC0575-001 05/29/2023

ADAMS, FAYETTE, HIGHLAND, HOCKING, JACKSON (Bloomfield, Franklin, Hamilton, Jefferson, Lick, Madison, Scioto, Coal, Jackson, Liberty, Milton & Washington Townships), PICKAWAY (Deer Creek, Perry, Pickaway, Salt Creek & Wayne Townships), PIKE (Beaver, Benton, Jackson, Mifflin, Pebble, PeePee, Perry, Seal, Camp Creek, Newton, Scioto, Sunfish, Union & Marion Townships), ROSS, SCIOTO & VINTON (Clinton, Eagle, Elk, Harrison, Jackson, Richland & Swan Townships)

	Rates	Fringes
ELECTRICIAN.....	\$ 37.00	22.26

ELEC0648-001 08/26/2024

BUTLER and WARREN COUNTIES (Deerfield, Hamilton, Harlan, Massie, Salem, Turtle Creek, Union & Washington Townships)

	Rates	Fringes
CABLE SPLICER.....	\$ 30.50	18.23
ELECTRICIAN.....	\$ 36.00	23.06

ELEC0673-004 12/30/2024

ASHTABULA (Excluding Orwell, Colebrook, Williamsfield, Wayne & Windsor Townships), GEAUGA (Burton, Chardon, Claridon, Hambden, Huntsburg, Montville, Munson, Newbury & Thompson Townships) and LAKE COUNTIES

	Rates	Fringes
CABLE SPLICER.....	\$ 33.81	21.47
ELECTRICIAN.....	\$ 39.47	24.02

ELEC0683-002 05/27/2024

CHAMPAIGN, CLARK, DELAWARE, FAIRFIELD, FRANKLIN, MADISON, PICKAWAY (Circleville, Darby, Harrison, Jackson, Madison, Monroe, Muhlenberg, Scioto, Walnut & Washington Townships), and UNION COUNTIES

	Rates	Fringes
CABLE SPLICER.....	\$ 41.50	24.19
ELECTRICIAN.....	\$ 40.50	25.20

ELEC0688-003 05/30/2022

ASHLAND, CRAWFORD, HURON (Richmond, New Haven, Ripley &

Greenwich Townships), KNOX (Liberty, Clinton, Union, Howard, Monroe, Middleberry, Morris, Wayne, Berlin, Pike, Brown & Jefferson Townships), MARION, MORROW, RICHLAND and WYANDOT (Sycamore, Crane, Eden, Pitt, Antrim & Tymochtee Townships) COUNTIES

	Rates	Fringes
ELECTRICIAN.....	\$ 32.30	21.83

ELEC0972-002 06/01/2023

ATHENS, MEIGS, MONROE, MORGAN, NOBLE, VINTON (Brown, Knox, Madison, Vinton & Wilkesville Townships), and WASHINGTON COUNTIES

	Rates	Fringes
CABLE SPLICER.....	\$ 35.70	30.26
ELECTRICIAN.....	\$ 35.45	30.25

ELEC1105-001 05/27/2024

COSHOCTON, GUERNSEY, KNOX (Jackson, Clay, Morgan, Miller, Milford, Hilliar, Butler, Harrison, Pleasant & College Townships), LICKING, MUSKINGUM, PERRY, and TUSCARAWAS (Auburn, York, Clay, Jefferson, Rush, Oxford, Washington, Salem, Perry & Bucks Townships) COUNTIES

	Rates	Fringes
ELECTRICIAN.....	\$ 39.60	24.41

ENGI0018-003 05/01/2024

ASHTABULA, CUYAHOGA, ERIE, GEAUGA, LAKE, LORAIN, MEDINA, PORTAGE, and SUMMIT COUNTIES

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1.....	\$ 45.63	16.41
GROUP 2.....	\$ 45.53	16.41
GROUP 3.....	\$ 44.49	16.41
GROUP 4.....	\$ 43.27	16.41
GROUP 5.....	\$ 37.98	16.41
GROUP 6.....	\$ 46.63	16.41
GROUP 7.....	\$ 46.63	16.41

OPERATING ENGINEER CLASSIFICATIONS

GROUP 1 - Air Compressor on Steel Erection; Barrier Moving Machine; Boiler Operator on Compressor or Generator when mounted on a Rig; Cableway; Combination Concrete Mixer & Tower; Concrete Plant (over 4 yd. Capacity); Concrete Pump; Crane (All Types, Including Boom Truck, Cherry Picker); Crane-Compact, Track or Rubber over 4,000 lbs. capacity; Cranes-Self Erecting, Stationary, Track or Truck (All Configurations); Derrick; Dragline; Dredge (Dipper, Clam or Suction); Elevating Grader or Euclid Loader; Floating Equipment (All Types); Gradall; Helicopter Crew

(Operator-Hoist or Winch); Hoe (all types); Hoisting Engine on Shaft or Tunnel Work; Hydraulic Gantry (Lifting System); Industrial-Type Tractor; Jet Engine Dryer (D8 or D9) Diesel Tractor; Locomotive (Standard Gauge); Maintenance Operator Class A; Mixer, Paving (Single or Double Drum); Mucking Machine; Multiple Scraper; Piledriving Machine (All Types); Power Shovel; Prentice Loader; Quad 9 (Double Pusher); Rail Tamper (with auto lifting & aligning device); Refrigerating Machine (Freezer Operation); Rotary Drill, on Caisson work; Rough Terrain Fork Lift with Winch/Hoist; Side-Boom; Slip-Form Paver; Tower Derrick; Tree Shredder; Trench Machine (Over 24" wide); Truck Mounted Concrete Pump; Tug Boat; Tunnel Machine and/or Mining Machine; Wheel Excavator; and Asphalt Plant Engineer (Cleveland District Only).

GROUP 2 - Asphalt Paver; Automatic Subgrader Machine, Self-Propelled (CMI Type); Bobcat Type and/or Skid Steer Loader with Hoe Attachment Greater than 7,000 lbs.; Boring Machine More than 48"; Bulldozer; Endloader; Horizontal Directional Drill (Over 50,000 ft lbs thrust); Hydro Milling Machine; Kolman-type Loader (production type-Dirt); Lead Greaseman; Lighting & Traffic Signal Installation Equipment (includes all groups or classifications); Material Transfer Equipment (Shuttle Buggy) Asphalt; Pettibone-Rail Equipment; Power Grader; Power Scraper; Push Cat; Rotomill (all), Grinders & Planers of All types; Trench Machine (24" wide & under); Vermeer type Concrete Saw; and Maintenance Operators (Portage and Summit Counties Only).

GROUP 3 - A-Frame; Air Compressor on Tunnel Work (low pressure); Asphalt Plant Engineer (Portage and Summit Counties Only); Bobcat-type and/or Skid Steer Loader with or without Attachments; Highway Drills (all types); Locomotive (narrow gauge); Material Hoist/Elevator; Mixer, Concrete (more than one bag capacity); Mixer, one bag capacity (Side Loader); Power Boiler (Over 15 lbs. Pressure) Pump Operator installing & operating Well Points; Pump (4" & over discharge); Roller, Asphalt; Rotovator (lime soil stabilizer); Switch & Tie Tampers (without lifting & aligning device); Utility Operator (Small equipment); Welding Machines; and Railroad Tie Insert/Remover; Articulating/straight bed end dumps if assigned (minus \$4.00 per hour).

GROUP 4 - Backfiller; Ballast Re-locator; Bars, Joint & Mesh Installing Machine; Batch Plant; Boring Machine Operator (48" or less); Bull Floats; Burlap & Curing Machine; Concrete Plant (capacity 4 yd. & under); Concrete Saw (Multiple); Conveyor (Highway); Crusher; Deckhand; Farm-type Tractor with attachments (highway); Finishing Machine; Fireperson, Floating Equipment (all types); Forklift; Form Trencher; Hydro Hammer expect masonry; Hydro Seeder; Pavement Breaker; Plant Mixer; Post Driver; Post Hole Digger (Power Auger); Power Brush Burner; Power Form Handling Equipment; Road Widening Trencher; Roller (Brick, Grade & Macadam); Self-Propelled Power Spreader; Self-Propelled Power Subgrader; Steam Fireperson; Tractor (Pulling Sheepfoot, Roller or Grader); and Vibratory Compactor with Integral Power.

GROUP 5 - Compressor (Portable, Sewer, Heavy & Highway); Drum Fireperson (Asphalt Plant); Generator; Masonry Fork Lift; Inboard-Outboard Motor Boat Launch; Oil Heater (asphalt

plant); Oiler/Helper; Power Driven Heater; Power Sweeper & Scrubber; Pump (under 4" discharge); Signalperson; Tire Repairperson; VAC/ALLS; Cranes - Compact, track or rubber under 4,000 pound capacity; fueling and greasing; and Chainmen.

GROUP 6 - Master Mechanic & Boom from 150 to 180.

GROUP 7 - Boom from 180 and over.

ENGI0018-004 05/01/2024

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, and YANDOT COUNTIES

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1.....	\$ 44.14	16.41
GROUP 2.....	\$ 44.02	16.41
GROUP 3.....	\$ 42.98	16.41
GROUP 4.....	\$ 41.80	16.41
GROUP 5.....	\$ 36.34	16.41
GROUP 6.....	\$ 45.14	16.41
GROUP 7.....	\$ 45.14	16.41

OPERATING ENGINEER CLASSIFICATIONS

GROUP 1 - Air Compressor on Steel Erection; Barrier Moving Machine; Boiler Operator on Compressor or Generator when mounted on a Rig; Cableway; Combination Concrete Mixer & Tower; Concrete Plant (over 4 yd. Capacity); Concrete Pump; Crane (All Types, Including Boom Truck, Cherry Picker); Crane-Compact, Track or Rubber over 4,000 lbs. capacity; Cranes-Self Erecting, Stationary, Track or Truck (All Configurations); Derrick; Dragline; Dredge (Dipper, Clam or Suction); Elevating Grader or Euclid Loader; Floating Equipment (All Types); Gradall; Helicopter Crew (Operator-Hoist or Winch); Hoe (all types); Hoisting Engine on Shaft or Tunnel Work; Hydraulic Gantry (Lifting System); Industrial-Type Tractor; Jet Engine Dryer (D8 or D9) Diesel Tractor; Locomotive (Standard Gauge); Maintenance Operator Class A; Mixer, Paving (Single or Double Drum); Mucking Machine; Multiple Scraper; Piledriving Machine (All Types); Power Shovel; Prentice Loader; Quad 9 (Double Pusher); Rail Tamper (with auto lifting & aligning device); Refrigerating Machine (Freezer Operation); Rotary Drill, on Caisson work; Rough Terrain Fork Lift with Winch/Hoist; Side-Boom; Slip-Form Paver; Tower Derrick; Tree Shredder; Trench Machine (Over 24" wide); Truck Mounted Concrete Pump; Tug Boat; Tunnel Machine and/or Mining Machine; and Wheel Excavator.

GROUP 2 - Asphalt Paver; Automatic Subgrader Machine, Self-Propelled (CMI Type); Bobcat Type and/or Skid Steer Loader with Hoe Attachment Greater than 7,000 lbs.; Boring Machine More than 48"; Bulldozer; Endloader; Hydro Milling Machine; Horizontal Directional Drill (over 50,000 ft. lbs. thrust); Kolman-type Loader (production type-Dirt); Lead Greaseman; Lighting & Traffic Signal Installation Equipment (includes all groups or classifications); Material Transfer Equipment (Shuttle Buggy) Asphalt; Pettibone-Rail Equipment; Power Grader; Power Scraper; Push Cat; Rotomill (all), Grinders & Planers of All types; Trench Machine (24" wide & under); and Vermeer type Concrete Saw.

GROUP 3 - A-Frame; Air Compressor on Tunnel Work (low pressure); Asphalt Plant Engineer; Bobcat-type and/or Skid Steer Loader with or without Attachments; Highway Drills (all types); Locomotive (narrow gauge); Material Hoist/Elevator; Mixer, Concrete (more than one bag capacity); Mixer, one bag capacity (Side Loader); Power Boiler (Over 15 lbs. Pressure) Pump Operator installing & operating Well Points; Pump (4" & over discharge); Railroad Tie Insert/Remover; Roller, Asphalt; Rotovator (lime soil stabilizer); Switch & Tie Tampers (without lifting & aligning device); Utility Operator (Small equipment); and Welding Machines; Articulating/straight bed end dumps if assigned (minus \$4.00 per hour).

GROUP 4 - Backfiller; Ballast Re-locator; Bars, Joint & Mesh Installing Machine; Batch Plant; Boring Machine Operator (48" or less); Bull Floats; Burlap & Curing Machine; Concrete Plant (capacity 4 yd. & under); Concrete Saw (Multiple); Conveyor (Highway); Crusher; Deckhand; Farm-type Tractor with attachments (highway); Finishing Machine; Fireperson, Floating Equipment (all types); Fork Lift; Form Trencher; Hydro Hammer except masonry; Hydro Seeder; Pavement Breaker; Plant Mixer; Post Driver; Post Hole Digger (Power Auger); Power Brush Burner; Power Form Handling Equipment; Road Widening Trencher; Roller (Brick, Grade & Macadam); Self-Propelled Power Spreader; Self-Propelled Power Subgrader; Steam Fireperson; Tractor (Pulling Sheepfoot, Roller or Grader); and Vibratory Compactor with Integral Power.

GROUP 5 - Compressor (Portable, Sewer, Heavy & Highway); Drum Fireperson (Asphalt Plant); Generator; Masonary Forklift; Inboard-Outboard Motor Boat Launch; Oil Heater (asphalt plant); Oiler/Helper; Power Driven Heater; Power Sweeper & Scrubber; Pump (under 4" discharge); Signaller; Tire Repairperson; VAC/ALLS; Cranes - Compact, track or rubber under 4,000 pound capacity; fueling and greasing; and Chainmen.

GROUP 6 - Master Mechanic & Boom from 150 to 180.

GROUP 7 - Boom from 180 and over.

ENGI0066-023 06/01/2023

COLUMBIANA, MAHONING & TRUMBULL COUNTIES

Rates Fringes

POWER EQUIPMENT OPERATOR
ASBESTOS; HAZARDOUS/TOXIC

WASTE PROJECTS		
GROUP 1 - A & B.....\$ 44.63	24.30	
ASBESTOS; HAZARDOUS/TOXIC		
WASTE PROJECTS		
GROUP 2 - A & B.....\$ 44.30	24.30	
ASBESTOS; HAZARDOUS/TOXIC		
WASTE PROJECTS		
GROUP 3 - A & B.....\$ 38.47	24.30	
ASBESTOS; HAZARDOUS/TOXIC		
WASTE PROJECTS		
GROUP 4 - A & B.....\$ 34.52	24.30	
ASBESTOS; HAZARDOUS/TOXIC		
WASTE PROJECTS		
GROUP 5 - A & B.....\$ 31.13	24.30	
HAZARDOUS/TOXIC WASTE		
PROJECTS		
GROUP 1 - C & D.....\$ 40.91	24.30	
HAZARDOUS/TOXIC WASTE		
PROJECTS		
GROUP 2 - C & D.....\$ 40.61	24.30	
HAZARDOUS/TOXIC WASTE		
PROJECTS		
GROUP 3 - C & D.....\$ 35.27	24.30	
HAZARDOUS/TOXIC WASTE		
PROJECTS		
GROUP 4 - C & D.....\$ 31.65	24.30	
HAZARDOUS/TOXIC WASTE		
PROJECTS		
GROUP 5 - C & D.....\$ 28.53	24.30	
ALL OTHER WORK		
GROUP 1.....\$ 37.19	24.30	
ALL OTHER WORK		
GROUP 2.....\$ 36.92	24.30	
ALL OTHER WORK		
GROUP 3.....\$ 32.06	24.30	
ALL OTHER WORK		
GROUP 4.....\$ 28.77	24.30	
ALL OTHER WORK		
GROUP 5.....\$ 25.94	24.30	

GROUP 1 - Rig, Pile Driver or Caisson Type; & Rig, Pile Hydraulic Unit Attached

GROUP 2 - Asphalt Heater Planer; Backfiller with Drag Attachment; Backhoe; Backhoe with Shear attached; Backhoe-Rear Pivotal Swing; Batch Plant-Central Mix Concrete; Batch Plant, Portable concrete; Berm Builder-Automatic; Boat Derrick; Boat-Tug; Boring Machine Attached to Tractor; Bullclam; Bulldozer; C.M.I. Road Builder & Similar Type; Cable Placer & Layer; Carrier-Straddle; Carryall-Scraper or Scoop; Chicago Boom; Compactor with Blade Attached; Concrete Saw (Vermeer or similar type); Concrete Spreader Finisher; Combination, Bidwell Machine; Crane; Crane-Electric Overhead; Crane-Rough Terrain; Crane-Side Boom; Crane-Truck; Crane-Tower; Derrick-Boom; Derrick-Car; Digger-Wheel (Not trencher or road widener); Double Nine; Drag Line; Dredge; Drill-Kenny or Similar Type; Easy Pour Median Barrier Machine (or similar type); Electromatic; Frankie Pile; Gradall; Grader; Gurry; Self-Propelled; Heavy Equipment Robotics Operator/Mechanic; Hoist-Monorail; Hoist-Stationary & Mobile Tractor; Hoist, 2 or 3 drum; Horizontal Directional Drill Operator; Jackall; Jumbo Machine; Kocal & Kuhlman; Land-Seagoing Vehicle; Loader, Elevating; Loader, Front End; Loader, Skid Steer;

Locomotive; Mechanic/Welder; Metro Chip Harvester with Boom; Mucking Machine; Paver-Asphalt Finishing Machine; Paver-Road Concrete; Paver-Slip Form (C.M.I. or similar); Place Crete Machine with Boom; Post Driver (Carrier mounted); Power Driven Hydraulic Pump & Jack (When used in Slip Form or Lift Slab Construction); Pump Crete Machine; Regulator-Ballast; Hydraulic Power Unit not attached to Rig for Pile Drillings; Rigs-Drilling; Roto Mill or similar Full Lane (8' Wide & Over); Roto Mill or similar type (Under 8'); Shovel; Slip Form Curb Machine; Speedwing; Spikemaster; Stoncrusher; Tie Puller & Loader; Tie Tamper; Tractor-Double Boom; Tractor with Attachments; Truck-Boom; Truck-Tire; Trench Machine; Tunnel Machine (Mark 21 Java or similar); & Whirley (or similar type)

GROUP 3 - Asphalt Plant; Bending Machine (Pipeline or similar type); Boring machine, Motor Driven; Chip Harvester without Boom; Cleaning Machine, Pipeline Type; Coating Machine, Pipeline Type; Compactor; Concrete Belt Placer; Concrete Finisher; Concrete Planer or Asphalt; Concrete Spreader; Elevator; Fork Lift (Home building only); Fork lift & Lulls; Fork Lift Walk Behind (Hoisting over 1 buck high); Form Line Machine; Grease Truck operator; Grout Pump; Gunnite Machine; Horizontal Directional Drill Locator; Single Drum Hoist with or without Tower; Huck Bolting Machine; Hydraulic Scaffold (Hoisting building materials); Paving Breaker (Self-propelled or Ridden); Pipe Dream; Pot Fireperson (Power Agitated); Refrigeration Plant; Road Widener; Roller; Sasgen Derrick; Seeding Machine; Soil Stabilizer (Pump type); Spray Cure Machine, Self-Propelled; Straw Blower Machine; Sub-Grader; Tube Finisher or Broom C.M.I. or similar type; & Tugger Hoist

GROUP 4 - Air Curtain Destructor & Similar Type; Batch Plant-Job Related; Boiler Operator; Compressor; Conveyor; Curb Builder, self-propelled; Drill Wagon; Generator Set; Generator-Steam; Heater-Portable Power; Hydraulic Manipulator Crane; Jack-Hydraulic Power driven; Jack-Hydraulic (Railroad); Ladavator; Minor Machine Operator; Mixer-Concrete; Mulching Machine; Pin Puller; Power Broom; Pulverizer; Pump; Road Finishing Machine (Pull Type); Saw-Concrete-Self-Propelled (Highway Work); Signal Person; Spray Cure Machine-Motor Powered; Stump Cutter; Tractor; Trencher Form; Water Blaster; Steam Jenny; Syphon; Vibrator-Gasoline; & Welding Machine

GROUP 5 - Brakeperson; Fireperson; & Oiler

IRON0017-002 05/01/2024

ASHTABULA (North of Route 6, starting at the Geauga County Line, proceeding east to State Route 45), CUYAHOGA, ERIE (Eastern 2/3), GEAUGA, HURON (East of a line drawn from the north border through Monroeville & Willard), LAKE, LORAIN, MEDINA (North of Old Rte. #224), PORTAGE (West of a line from Middlefield to Shalersville to Deerfield), and SUMMIT (North of Old Rte. #224, including city limits of Barberton) COUNTIES

	Rates	Fringes
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IRONWORKER

Ornamental, Reinforcing, &		
Structural.....	\$ 36.83	29.01

IRON0017-010 05/01/2024

ASHTABULA (Eastern part from Lake Erie on the north to route #322 on the south to include Conneaut, Kingsville, Sheffield, Denmark, Dorset, Cherry Valley, Wayne, Monroe, Pierpont, Richmond, Andover & Williamsfield Townships)

	Rates	Fringes
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IRONWORKER

Structural, including metal building erection & Reinforcing.....	\$ 36.83	29.01
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IRON0044-001 06/01/2024

ADAMS (Western Part), BROWN, BUTLER (Southern Part), CLERMONT, CLINTON (South of a line drawn from Blanchester to Lynchburg), HAMILTON, HIGHLAND (Excluding eastern one-fifth & portion of county inside lines drawn from Marshall to Lynchburg from the northern county line through E. Monroe to Marshall) and WARREN (South of a line drawn from Blanchester through Morrow to the west county line) COUNTIES

	Rates	Fringes
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IRONWORKER, REINFORCING.....	\$ 35.87	23.60
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IRON0044-002 06/01/2024

CLINTON (South of a line drawn from Blanchester to Lynchburg), HAMILTON, HIGHLAND (Excluding eastern one-fifth & portion of county inside lines drawn from Marshall to Lynchburg from the northern county line through E. Monroe to Marshall) & WARREN (South of a line drawn from Blanchester through Morrow to the west county line)

	Rates	Fringes
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IRONWORKER

Fence Erector.....	\$ 33.60	23.60
Ornamental; Structural.....	\$ 35.37	23.60

IRON0055-003 07/01/2024

CRAWFORD (Area Between lines drawn from where Hwy #598 & #30 meet through N. Liberty to the northern border & from said Hwy junction point due west to the border), DEFIANCE (S. of a line drawn from where Rte. #66 meets the northern line through Independence to the eastern county border), ERIE (Western 1/3), FULTON, HANCOCK, HARDIN (North of a line drawn from Maysville to a point 4 miles south of the northern line on the eastern line), HENRY, HURON (West of a line drawn from the northern border through Monroeville & Willard), LUCAS, OTTAWA, PUTNAM (East of a line drawn from the northern border down through Miller City to where #696 meets the southern border), SANDUSKY, SENECA, WILLIAMS (East of a line drawn from Pioneer through Stryker to the southern border), WOOD & WYANDOT (North of Rte. #30)

	Rates	Fringes
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IRONWORKER

Fence Erector.....	\$ 26.40	24.62
Flat Road Mesh.....	\$ 29.77	21.30
Tunnels & Caissons Under Pressure.....	\$ 29.77	21.30
All Other Work.....	\$ 35.50	29.20

IRON0147-002 06/01/2024

ALLEN (Northern half), DEFIANCE (Northern part, excluding south of a line drawn from where Rte. #66 meets the northern line through Independence to the eastern county border), MERCER (Northern half), PAULDING, PUTNAM (Western part, excluding east of a line drawn from the northern border down through Miller City to where #696 meets the southern border), VAN WERT, and WILLIAMS (Western part, excluding east of a line drawn from Pioneer through Stryker to the southern border) COUNTIES

	Rates	Fringes
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IRONWORKER.....	\$ 34.20	26.39
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IRON0172-002 06/01/2024

CHAMPAIGN (Eastern one-third), CLARK (Eastern one-fourth), COSHOCTON (West of a line beginning at the northwestern county line going through Walhonding & Tunnel Hill to the southern county line), CRAWFORD (South of Rte. #30), DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, HARDIN (Excluding a line drawn from Roundhead to Maysville), HIGHLAND (Eastern one-fifth), HOCKING, JACKSON (Northern half), KNOX, LICKING, LOGAN (Eastern one-third), MADISON, MARION, MORROW, MUSKINGUM (West of a line starting at Adams Mill going to Adamsville & going from Adamsville through Blue Rock to the southern border), PERRY, PICKAWAY, PIKE (Northern half), ROSS, UNION, VINTON and WYANDOT (South of Rte. #30) COUNTIES

	Rates	Fringes
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IRONWORKER.....	\$ 36.77	22.85
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IRON0207-004 06/01/2024

ASHTABULA (Southern part starting at the Geauga County line), COLUMBIANA (E. of a line from Damascus to Highlandtown), MAHONING (N. of Old Route #224), PORTAGE (E. of a line from Middlefield to Shalersville to Deerfield) & TRUMBULL

	Rates	Fringes
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IRONWORKER

Layout; Sheeter.....	\$ 35.83	27.41
Ornamental; Reinforcing; Structural.....	\$ 34.83	27.41
Ornamental; Reinforcing.....	\$ 28.92	25.61

IRON0290-002 06/01/2024

ALLEN (Southern half), AUGLAIZE, BUTLER (North of a line drawn from east to the west county line going through Oxford,

Darrrtown & Woodsdale), CHAMPAIGN (Excluding east of a line drawn from Catawla to the point where #68 intersects the northern county line), CLARK (Western two-thirds), CLINTON (Excluding south of a line drawn from Blanchester to Lynchburg), DARKE, GREENE, HIGHLAND (Inside lines drawn from Marshall to Lynchburg & from the northern county line through East Monroe to Marshall), LOGAN (West of a line drawn from West Liberty to where the northern county line meets the western county line of Hardin), MERCER (Southern half), MIAMI, MONTGOMERY, PREBLE, SHELBY & WARREN (Excluding south of a line drawn from Blanchester through Morrow to the western county line) COUNTIES

	Rates	Fringes
IRONWORKER.....	\$ 35.39	24.35

IRON0549-003 12/01/2022		

BELMONT, GUERNSEY, HARRISON, JEFFERSON, MONROE & MUSKINGUM (Excluding portion west of a line starting at Adams Mill going to Adamsville and going from Adamsville through Blue Rock to the south border)

	Rates	Fringes
IRONWORKER.....	\$ 35.19	25.66

IRON0550-004 05/01/2024		

ASHLAND, CARROLL, COLUMBIANA (W. of a line from Damascus to Highlandtown), COSHOCTON (E. of a line beginning at NW Co. line going through Walhonding & Tunnel Hill to the South Co. line), HOLMES, HURON (S. of Old Rte. #224), MAHONING (S. of Old Rte. #224), MEDINA (S. of Old Rte. #224), PORTAGE (S. of Old Rte. #224), RICHLAND, STARK, SUMMIT (S. of Old Rte. #224, Excluding city limits of Barberton), TUSCARAWAS, & WAYNE

	Rates	Fringes
Ironworkers:Structural, Ornamental and Reinforcing.....	\$ 34.70	22.88

IRON0769-004 06/01/2024		

ADAMS (Eastern Half), GALLIA, JACKSON (Southern Half), LAWRENCE & SCIOTO

	Rates	Fringes
IRONWORKER.....	\$ 37.66	29.24

IRON0787-003 06/01/2024		

ATHENS, MEIGS, MORGAN, NOBLE, and WASHINGTON COUNTIES

	Rates	Fringes
IRONWORKER.....	\$ 33.00	24.25

LAB00265-008 05/01/2024		

	Rates	Fringes
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LABORER

ASHTABULA, ERIE, HURON, LORAIN, LUCAS, MAHONING, MEDINA, OTTAWA, PORTAGE, SANDUSKY, STARK, SUMMIT, TRUMBULL & WOOD COUNTIES		
GROUP 1.....	\$ 35.95	14.45
GROUP 2.....	\$ 36.12	14.45
GROUP 3.....	\$ 36.45	14.45
GROUP 4.....	\$ 36.90	14.45
CUYAHOGA AND GEAUGA COUNTIES ONLY: SEWAGE PLANTS, WASTE PLANTS, WATER TREATMENT FACILITIES, PUMPING STATIONS, & ETHANOL PLANTS CONSTRUCTION.....		
	\$ 38.56	14.45
CUYAHOGA, GEAUGA & LAKE COUNTIES		
GROUP 1.....	\$ 37.18	14.45
GROUP 2.....	\$ 37.35	14.45
GROUP 3.....	\$ 37.68	14.45
GROUP 4.....	\$ 38.13	14.45
REMAINING COUNTIES OF OHIO		
GROUP 1.....	\$ 35.52	14.45
GROUP 2.....	\$ 35.69	14.45
GROUP 3.....	\$ 36.02	14.45
GROUP 4.....	\$ 36.47	14.45

LABORER CLASSIFICATIONS

GROUP 1 - Asphalt Laborer; Carpenter Tender; Concrete Curing Applicator; Dump Man (Batch Truck); Guardrail and Fence Installer; Joint Setter; Laborer (Construction); Landscape Laborer; Mesh Handlers & Placer; Right-of-way Laborer; Riprap Laborer & Grouter; Scaffold Erector; Seal Coating; Surface Treatment or Road Mix Laborer; Sign Installer; Slurry Seal; Utility Man; Bridge Man; Handyman; Waterproofing Laborer; Flagperson; Hazardous Waste (level D); Diver Tender; Zone Person & Traffic Control

GROUP 2 - Asphalt Raker; Concrete Puddler; Kettle Man (Pipeline); Machine Driven Tools (Gas, Electric, Air); Mason Tender; Brick Paver; Mortar Mixer; Power Buggy or Power Wheelbarrow; Paint Striper; Sheeting & Shoring Man; Surface Grinder Man; Plastic Fusing Machine Operator; Pug Mill Operator; & Vacuum Devices (wet or dry); Rodding Machine Operator; Diver; Screwman or Paver; Screed Person; Water Blast, Hand Held Wand; Pumps 4" & Under (Gas, Air or Electric) & Hazardous Waste (level C); Air Track and Wagon Drill; Bottom Person; Cofferdam (below 25 ft. deep); Concrete Saw Person; Cutting with Burning Torch; Form Setter; Hand Spiker (Railroad); Pipelayer; Tunnel Laborer (without air) & Caisson; Underground Person (working in Sewer and Waterline, Cleaning, Repairing & Reconditioning); Sandblaster Nozzle Person; & Hazardous Waste (level B)

GROUP 3 - Blaster; Mucker; Powder Person; Top Lander; Wrencher (Mechanical Joints & Utility Pipeline); Yarnier; Hazardous Waste (level A); Concrete Specialist; Concrete Crew in Tunnels (With Air-pressurized - \$1.00 premium); Curb Setter & Cutter; Grade Checker; Utility Pipeline

Tapper; Waterline; and Caulker

GROUP 4 - Miner (With Air-pressurized - \$1.00 premium); &
Gunitite Nozzle Person

TUNNEL LABORER WITH AIR-PRESSURIZED ADD \$1.00 TO BASE RATE

SIGNAL PERSON WILL RECEIVE THE RATE EQUAL TO THE RATE PAID
THE LABORER CLASSIFICATION FOR WHICH HE OR SHE IS SIGNALING.

PAIN0006-002 05/01/2023

ASHTABULA, CUYAHOGA, GEAUGA, LAKE, LORAIN, PORTAGE (N. of the
East-West Turnpike) & SUMMIT (N. of the East-West Turnpike)

	Rates	Fringes
PAINTER		
COMMERCIAL NEW WORK; REMODELING; & RENOVATIONS		
GROUP 1.....	\$ 30.75	18.95
GROUP 2.....	\$ 31.15	18.95
GROUP 3.....	\$ 31.45	18.95
GROUP 4.....	\$ 37.01	18.95
COMMERCIAL REPAINT		
GROUP 1.....	\$ 29.25	18.95
GROUP 2.....	\$ 29.65	18.95
GROUP 3.....	\$ 29.95	18.95

PAINTER CLASSIFICATIONS - COMMERCIAL NEW WORK; REMODELING; &
RENOVATIONS

GROUP 1 - Brush; & Roller

GROUP 2 - Sandblasting & Buffing

GROUP 3 - Spray Painting; Closed Steel Above 55 feet; Bridges
& Open Structural Steel; Tanks - Water Towers; Bridge
Painters; Bridge Riggers; Containment Builders

GROUP 4 - Bridge Blaster

PAINTER CLASSIFICATIONS - COMMERCIAL REPAINT

GROUP 1 - Brush; & Roller

GROUP 2 - Sandblasting & Buffing

GROUP 3 - Spray Painting

PAIN0007-002 07/01/2024

FULTON, HENRY, LUCAS, OTTAWA (Excluding Allen, Bay, Bono,
Catawba Island, Clay Center, Curtice, Danbury, Eagle Beach,
Elliston, Elmore, Erie, Fishback, Gem Beach & Genova) & WOOD

	Rates	Fringes
PAINTER		
NEW COMMERCIAL WORK		
GROUP 1.....	\$ 31.84	20.79

GROUP 2.....	\$ 32.84	20.79
GROUP 3.....	\$ 32.84	20.79
GROUP 4.....	\$ 32.84	20.79
GROUP 5.....	\$ 32.84	20.79
GROUP 6.....	\$ 32.84	20.79
GROUP 7.....	\$ 32.84	20.79
GROUP 8.....	\$ 32.84	20.79
GROUP 9.....	\$ 32.84	20.79

REPAINT IS 90% OF JR

PAINTER CLASSIFICATIONS

GROUP 1 - Brush; Spray & Sandblasting Pot Tender

GROUP 2 - Refineries & Refinery Tanks; Surfaces 30 ft. or over where material is applied to or labor performed on above ground level (exterior), floor level (interior)

GROUP 3 - Swing Stage & Chair

GROUP 4 - Lead Abatement

GROUP 5 - All Methods of Spray

GROUP 6 - Solvent-Based Catalized Epoxy Materials of 2 or More Component Materials, to include Solvent-Based Conversion Varnish (excluding water based)

GROUP 7 - Spray Solvent Based Material; Sand & Abrasive Blasting

GROUP 8 - Towers; Tanks; Bridges; Stacks Over 30 Feet

GROUP 9 - Epoxy Spray (excluding water based)

PAIN0012-008 05/01/2019

BUTLER COUNTY

	Rates	Fringes
PAINTER		
GROUP 1.....	\$ 21.95	10.20
GROUP 2.....	\$ 25.30	10.20
GROUP 3.....	\$ 25.80	10.20
GROUP 4.....	\$ 26.05	10.20
GROUP 5.....	\$ 26.30	10.20

PAINTER CLASSIFICATIONS

GROUP 1: Bridge Equipment Tender; Bridge/Containment Builder

GROUP 2: Brush & Roller

GROUP 3: Spray

GROUP 4: Sandblasting; & Waterblasting

GROUP 5: Elevated Tanks; Steeplejack Work; Bridge; & Lead Abatement

PAIN0012-010 05/01/2019

BROWN, CLERMONT, CLINTON, HAMILTON & WARREN

	Rates	Fringes
PAINTER		
HEAVY & HIGHWAY BRIDGES- GUARDRAILS-LIGHTPOLES- STRIPING		
Bridge Equipment Tender and Containment Builder....	\$ 21.95	10.20
Bridges when highest point of clearance is 60 feet or more; & Lead		
Abatement Projects.....	\$ 26.30	10.20
Brush & Roller.....	\$ 25.30	10.20
Sandblasting & Hopper Tender; Water Blasting.....	\$ 26.05	10.20
Spray.....	\$ 25.80	10.20

PAIN0093-001 12/01/2024ATHENS, GUERNSEY, HOCKING, MONROE, MORGAN, NOBLE and
WASHINGTON COUNTIES

	Rates	Fringes
PAINTER		
Bridges; Locks; Dams; Tension Towers; & Energized Substations.....		
Power Generating Facilities..	\$ 36.44	24.46
	\$ 33.29	24.46

PAIN0249-002 05/01/2024

CLARK, DARKE, GREENE, MIAMI, MONTGOMERY & PREBLE

	Rates	Fringes
PAINTER		
GROUP 1 - Brush & Roller....	\$ 27.15	13.64
GROUP 2 - Swing, Scaffold Bridges; Structural Steel; Open Acid Tank; High Tension Electrical Equipment; & Hot Pipes.....	\$ 27.15	13.64
GROUP 3 - Spray; Sandblast; Steamclean; Lead Abatement.....	\$ 27.90	13.64
GROUP 4 - Steeplejack Work..	\$ 28.10	13.64
GROUP 5 - Coal Tar.....	\$ 28.65	13.64
GROUP 6 - Bridge Equipment Tender & or Containment Builder.....	\$ 35.86	13.64
GROUP 7 - Tanks, Stacks & Towers.....	\$ 31.09	13.64
GROUP 8 - Bridge Blaster, Rigger.....	\$ 38.86	13.64

PAIN0356-002 09/01/2009

KNOX, LICKING, MUSKINGUM, and PERRY

	Rates	Fringes
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PAINTER

Bridge Equipment Tenders and Containment Builders....	\$ 27.93	7.25
Bridges; Blasters; and Riggers.....	\$ 34.60	7.25
Brush and Roller.....	\$ 20.93	7.25
Sandblasting; Steam Cleaning; Waterblasting; and Hazardous Work.....	\$ 25.82	7.25
Spray.....	\$ 21.40	7.25
Structural Steel and Swing Stage.....	\$ 25.42	7.25
Tanks; Stacks; and Towers...	\$ 28.63	7.25

PAIN0438-002 12/01/2023

BELMONT, HARRISON and JEFFERSON COUNTIES

	Rates	Fringes
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PAINTER

Bridges, Locks, Dams, Tension Towers & Energized Substations.....	\$ 36.09	19.49
Power Generating Facilities.	\$ 32.94	19.49

PAIN0476-001 06/01/2024

COLUMBIANA, MAHONING, and TRUMBULL COUNTIES

	Rates	Fringes
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PAINTER

GROUP 1.....	\$ 28.39	17.14
GROUP 2.....	\$ 35.02	17.14
GROUP 3.....	\$ 28.60	17.14
GROUP 4.....	\$ 28.89	17.14
GROUP 5.....	\$ 29.04	17.14
GROUP 6.....	\$ 29.29	17.14
GROUP 7.....	\$ 30.39	17.14

PAINTER CLASSIFICATIONS:

GROUP 1: Painters, Brush & Roller

GROUP 2: Bridges

GROUP 3: Structural Steel

GROUP 4: Spray, Except Bar Joist/Deck

GROUP 5: Epoxy/Mastic; Spray- Bar Joist/Deck; Working Above
50 Feet; and Swingstages

GROUP 6: Tanks; Sandblasting

GROUP 7: Towers; Stacks

PAIN0555-002 11/01/2023

ADAMS, HIGHLAND, JACKSON, PIKE & SCIOTO

	Rates	Fringes
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PAINTER

GROUP 1.....	\$ 32.18	20.29
GROUP 2.....	\$ 33.81	20.29
GROUP 3.....	\$ 35.44	20.29
GROUP 4.....	\$ 38.63	20.29

PAINTER CLASSIFICATIONS

GROUP 1 - Containment Builder

GROUP 2 - Brush; Roller; Power Tools, Under 40 feet

GROUP 3 - Sand Blasting; Spray; Steam Cleaning; Pressure Washing; Epoxy & Two Component Materials; Lead Abatement; Hazardous Waste; Toxic Materials; Bulk & Storage Tanks of 25,000 Gallon Capacity or More; Elevated Tanks

GROUP 4 - Stacks; Bridges

PAIN0639-001 05/01/2011

	Rates	Fringes
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Sign Painter & Erector.....	\$ 20.61	3.50+a+b+c
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FOOTNOTES: a. 7 Paid Holidays: New Year's Day; Memorial Day; July 4th; Labor Day; Thanksgiving Day; Christmas Day & 1 Floating Day

b. Vacation Pay: After 1 year's service - 5 days' paid vacation; After 2, but less than 10 years' service - 10 days' paid vacation; After 10, but less than 20 years' service - 15 days' paid vacation; After 20 years' service - 20 days' paid vacation

c. Funeral leave up to 3 days maximum paid leave for death of mother, father, brother, sister, spouse, child, mother-in-law, father-in-law, grandparent and inlaw provided employee attends funeral

PAIN0788-002 06/01/2024

ASHLAND, CRAWFORD, ERIE, HANCOCK, HURON, MARION, MORROW, OTTAWA (Allen, Bay, Bono, Catawba Island, Clay Center, Curtice, Danbury, Eagle Beach, Elliston, Elmore, Erie, Fishback, Gem Beach & Genoa), RICHLAND, SANDUSKY, SENECA & WYANDOT

	Rates	Fringes
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PAINTER

Brush & Roller.....	\$ 29.13	17.52
Structural Steel.....	\$ 30.73	17.52

WINTER REPAINT: Between December 1 to March 31 - 90%JR

\$.50 PER HOUR SHALL BE ADDED TO THE RATE OF PAY FOR THE CLASSIFICATION OF WORK:

While working swingstage, boatswain chair, needle beam and horizontal cable. While operating sprayguns, sandblasting, cobblasting and high pressure waterblasting (4000psi).

\$1.00 PER HOUR SHALL BE ADDED TO THE RATE OF PAY FOR THE CLASSIFICATION OF WORK:

For the application of catalized epoxy, including latex epoxy that is deemed hazardous, lead abatement, or for work or material where special precautions beyond normal work duties must be taken. For working on stacks, tanks, and towers over 40 feet in height.

PAIN0813-005 12/01/2008

GALLIA, LAWRENCE, MEIGS & VINTON

	Rates	Fringes
PAINTER		
Base Rate.....	\$ 24.83	10.00
Bridges, Locks, Dams & Tension Towers.....	\$ 27.83	10.00

PAIN0841-001 06/01/2023

MEDINA, PORTAGE (South of and including Ohio Turnpike), and SUMMIT (South of and including Ohio Turnpike) COUNTIES

	Rates	Fringes
Painters:		
GROUP 1.....	\$ 30.18	15.50
GROUP 2.....	\$ 30.83	15.50
GROUP 3.....	\$ 30.93	15.50
GROUP 4.....	\$ 31.03	15.50
GROUP 5.....	\$ 31.43	15.50
GROUP 6.....	\$ 39.20	11.75
GROUP 7.....	\$ 31.68	15.50

PAINTER CLASSIFICATIONS:

GROUP 1 - Brush, Roller & Paperhanger

GROUP 2 - Epoxy Application

GROUP 3 - Swing Scaffold, Bosum Chair, & Window Jack

GROUP 4 - Spray Gun Operator of Any & All Coatings

GROUP 5 - Sandblast, Painting of Standpipes, etc. from Scaffolds, Bridge Work and/or Open Structural Steel, Standpipes and/or Water Towers

GROUP 6 - Public & Commerce Transportation, Steel or Galvanized, Bridges, Tunnels & Related Support Items (concrete)

GROUP 7 - Synthetic Exterior, Drywall Finisher and/or Taper, Drywall Finisher and Follow-up Man Using Automatic Tools

PAIN0841-002 06/01/2023

CARROLL, COSHOCTON, HOLMES, STARK, TUSCARAWAS & WAYNE

Rates	Fringes
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PAINTER

Bridges; Towers, Poles & Stacks; Sandblasting Steel; Structural Steel & Metalizing.....	\$ 31.43	15.50
Brush & Roller.....	\$ 30.18	15.50
Spray; Tank Interior & Exterior.....	\$ 31.03	15.50

PAIN1020-002 07/01/2024ALLEN, AUGLAIZE, CHAMPAIGN, DEFIANCE, HARDIN, LOGAN, MERCER,
PAULDING, PUTNAM, SHELBY, VAN WERT, and WILLIAMS COUNTIES

Rates Fringes

PAINTER

Brush & Roller.....	\$ 26.54	17.66
Drywall Finishing & Taping..	\$ 27.29	17.66
Lead Abatement.....	\$ 28.29	17.66
Spray, Sandblasting Pressure Cleaning, & Refinery.....	\$ 27.29	17.66
Swing Stage, Chair, Spiders, & Cherry Pickers...	\$ 26.79	17.66
Wallcoverings.....	\$ 27.29	17.66

All surfaces 40 ft. or over where material is applied to or
labor performed on, above ground level (exterior), floor
level (interior) - \$.50 premium

Applying Coal Tar Products - \$1.00 premium

PAIN1275-002 05/01/2024DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, MADISON, PICKAWAY, ROSS
& UNION

Rates Fringes

PAINTER

Bridges.....	\$ 36.26	14.91
Brush; Roller.....	\$ 30.65	14.91
Sandblasting; Steamcleaning; Waterblasting (3500 PSI or Over)& Hazardous Work.....	\$ 31.35	14.91
Spray.....	\$ 31.15	14.91
Stacks; Tanks; & Towers.....	\$ 33.46	14.91
Structural Steel & Swing Stage.....	\$ 29.50	14.91

PLAS0109-001 06/01/2024

MEDINA, PORTAGE, STARK, and SUMMIT COUNTIES

Rates Fringes

PLASTERER.....	\$ 31.70	23.63
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PLAS0109-003 06/01/2024

CARROLL, HOLMES, TUSCARAWAS, and WAYNE COUNTIES

	Rates	Fringes
PLASTERER.....	\$ 31.70	23.63

PLAS0132-002 07/01/2024		

BROWN, BUTLER, CLERMONT, HAMILTON, HIGHLAND, WARREN COUNTIES

	Rates	Fringes
PLASTERER.....	\$ 30.40	16.54

PLAS0404-002 05/01/2018		

ASHTABULA, CUYAHOGA, GEAUGA, AND LAKE COUNTIES

	Rates	Fringes
PLASTERER.....	\$ 29.63	17.11

PLAS0404-003 05/01/2018		

LORAIN COUNTY

	Rates	Fringes
PLASTERER.....	\$ 28.86	17.11

PLAS0526-022 05/01/2018		

COLUMBIANA, MAHONING, and TRUMBULL COUNTIES

	Rates	Fringes
PLASTERER.....	\$ 28.86	17.11

PLAS0526-023 05/01/2018		

BELMONT, HARRISON, and JEFFERSON COUNTIES

	Rates	Fringes
PLASTERER.....	\$ 28.21	17.11

PLAS0886-001 07/01/2024		

FULTON, HANCOCK, HENRY, LUCAS, PUTNAM, and WOOD COUNTIES

	Rates	Fringes
PLASTERER.....	\$ 33.73	23.25

* PLAS0886-003 07/01/2024		

DEFIANCE, ERIE, HURON, OTTAWA, PAULDING, SANDUSKY, and SENECA

	Rates	Fringes
PLASTERER.....	\$ 33.73	23.25

* PLAS0886-004 07/01/2024		

ALLEN, AUGLAIZE, HARDIN, LOGAN, MERCER, and VAN WERT

	Rates	Fringes
PLASTERER.....	\$ 33.73	23.25

PLUM0042-002 07/01/2024

ASHLAND, CRAWFORD, ERIE, HURON, KNOX, LORAIN, MORROW, RICHLAND
& WYANDOT

	Rates	Fringes
Plumber, Pipefitter, Steamfitter.....	\$ 40.62	25.67

PLUM0050-002 07/01/2024

DEFIANCE, FULTON, HANCOCK, HENRY, LUCAS, OTTAWA, PAULDING,
PUTNAM, SANDUSKY, SENECA, WILLIAMS & WOOD

	Rates	Fringes
Plumber, Pipefitter, Steamfitter.....	\$ 49.70	30.76

PLUM0055-003 05/01/2024

ASHTABULA, CUYAHOGA, GEAUGA, LAKE, MEDINA (N. of Rte. #18 &
Smith Road) & SUMMIT (N. of Rte. #303, including the corporate
limits of the city of Hudson)

	Rates	Fringes
PLUMBER.....	\$ 42.36	29.90

PLUM0083-001 07/01/2023

BELMONT & MONROE (North of Rte. #78)

	Rates	Fringes
Plumber and Steamfitter.....	\$ 35.94	37.35

PLUM0094-002 05/01/2024

CARROLL (Northern Half), STARK, and WAYNE COUNTIES

	Rates	Fringes
PLUMBER/PIPEFITTER.....	\$ 45.23	24.89

PLUM0120-002 04/29/2024

ASHTABULA, CUYAHOGA, GEAUGA, LAKE, LORAIN (the C.E.I. Power
House in Avon Lake), MEDINA (N. of Rte. #18) & SUMMIT (N. of
#303)

	Rates	Fringes
PIPEFITTER.....	\$ 47.07	28.15

 PLUM0162-002 06/01/2024

CHAMPAIGN, CLARK, CLINTON, DARKE, FAYETTE, GREENE, MIAMI,
 MONTGOMERY & PREBLE

	Rates	Fringes
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Plumber, Pipefitter, Steamfitter.....	\$ 43.05	27.18
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PLUM0168-002 06/01/2024

MEIGS, MONROE (South of Rte. #78), MORGAN (South of Rte. #78)
 & WASHINGTON

	Rates	Fringes
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PLUMBER/PIPEFITTER.....	\$ 39.43	37.29
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PLUM0189-002 06/01/2024

DELAWARE, FAIRFIELD, FRANKLIN, HOCKING, LICKING, MADISON,
 MARION, PERRY, PICKAWAY, ROSS & UNION

	Rates	Fringes
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Plumber, Pipefitter, Steamfitter.....	\$ 43.25	26.94
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PLUM0219-002 06/01/2024

MEDINA (Rte. #18 from eastern edge of Medina Co., west to
 eastern corporate limits of the city of Medina, & on the county
 road from the west corporate limits of Medina running due west
 to and through community of Risley to the western edge of
 Medina County - All territory south of this line), PORTAGE, and
 SUMMIT (S. of Rte. #303) COUNTIES

	Rates	Fringes
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Plumber and Steamfitter.....	\$ 45.37	27.64
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PLUM0392-002 06/01/2024

BROWN, BUTLER, CLERMONT, HAMILTON & WARREN

	Rates	Fringes
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PLUMBER/PIPEFITTER.....	\$ 40.65	26.75
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PLUM0396-001 06/01/2024

COLUMBIANA (Excluding Washington & Yellow Creek Townships &
 Liverpool Twp. - Secs. 35 & 36 - West of County Road #427),
 MAHONING and TRUMBULL COUNTIES

	Rates	Fringes
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PLUMBER/PIPEFITTER.....	\$ 38.45	28.96
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 PLUM0495-002 06/01/2024

CARROLL (Rose, Monroe, Union, Lee, Orange, Perry & Loudon Townships), COLUMBIANA (Washington & Yellow Creek Townships & Liverpool Township, Secs. 35 & 36, West of County Rd. #427), COSHOCTON, GUERNSEY, HARRISON, HOLMES, JEFFERSON, MORGAN (South to State Rte. #78 & from McConnelville west on State Rte. #37 to the Perry County line), MUSKINGUM, NOBLE, and TUSCARAWAS COUNTIES

	Rates	Fringes
Plumber, Pipefitter, Steamfitter.....	\$ 37.82	36.70

PLUM0577-002 06/01/2024

ADAMS, ATHENS, GALLIA, HIGHLAND, JACKSON, LAWRENCE, PIKE, SCIOTO & VINTON

	Rates	Fringes
Plumber, Pipefitter, Steamfitter.....	\$ 41.65	27.48

PLUM0776-002 07/01/2024

ALLEN, AUGLAIZE, HARDIN, LOGAN, MERCER, SHELBY and VAN WERT COUNTIES

	Rates	Fringes
Plumber, Pipefitter, Steamfitter.....	\$ 42.07	29.35

TEAM0377-003 05/01/2024

STATEWIDE, EXCEPT CUYAHOGA, GEAUGA & LAKE

	Rates	Fringes
TRUCK DRIVER		
GROUP 1.....	\$ 32.54	16.80
GROUP 2.....	\$ 32.96	16.80

TRUCK DRIVER CLASSIFICATIONS

GROUP 1 - Asphalt Distributor; Batch; 4- Wheel Service; 4-Wheel Dump; Oil Distributor & Tandem

GROUP 2 - Tractor-Trailer Combination: Fuel; Pole Trailer; Ready Mix; Semi-Tractor; & Asphalt Oil Spraybar Man When Operated From Cab; 5 Axles & Over; Belly Dump; End Dump; Articulated Dump; Heavy Duty Equipment; Low Boy; & Truck Mechanic

 TEAM0436-002 05/01/2024

CUYAHOGA, GEAUGA & LAKE

	Rates	Fringes
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TRUCK DRIVER

GROUP 1.....	\$ 32.25	18.95
GROUP 2.....	\$ 33.75	18.95

GROUP 1: Straight & Dump, Straight Fuel

GROUP 2: Semi Fuel, Semi Tractor, Euclids, Darts, Tank, Asphalt Spreaders, Low Boys, Carry-All, Tourna-Rockers, Hi-Lifts, Extra Long Trailers, Semi-Pole Trailers, Double Hook-Up Tractor Trailers including Team Track & Railroad Siding, Semi-Tractor & Tri-Axle Trailer, Tandem Tractor & Tandem Trailer, Tag Along Trailer, Expandable Trailer or Towing Requiring Road Permits, Ready-Mix (Agitator or Non-Agitator), Bulk Concrete Driver, Dry Batch Truck, Articulated End Dump

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$17.75) or 13658 (\$13.30). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical

order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

- a) a survey underlying a wage determination
- b) an existing published wage determination
- c) an initial WHD letter setting forth a position on a wage determination matter
- d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that

the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION"