



C-97005-0075

MT. LEBANON POOL FILTRATION REPLACEMENT CONTRACT

**MUNICIPALITY OF MT. LEBANON
ALLEGHENY COUNTY, PENNSYLVANIA**

This project involves demolition and replacement of the pool filtration system; electrical services; installation of a pool surge tank; installation of liquid chlorine tanks and configuration of chlorine application systems; internal building configuration for placement of equipment including CMU block wall demolition and internal door installation; all necessary plumbing appurtenances for connection of new filter system, surge tank, and equipment to the existing system; and site restoration, complete in place.

Bid Opening Date: December 3rd, 2024

Bid Opening Time: 11:00 A.M.

Pre-Bid Meeting Date: November 19th, 2024

Pre-Bid Meeting Time: 10:30 A.M.

P R E P A R E D F O R

Municipality of Mt. Lebanon
710 Washington Road
Pittsburgh, PA 15228

P R E P A R E D B Y

The Gateway Engineers, Inc.
100 McMorris Road
Pittsburgh, PA 15205-9401
412.921.4030 PHONE
412.921.9960 FAX

www.gatewayengineers.com



A FULL-SERVICE CIVIL ENGINEERING FIRM

OUR HERITAGE. YOUR FUTURE.

CONTRACT DOCUMENTS

Project Directory

OWNER:	Municipality of Mt. Lebanon David Donnellan, Recreation Director 900 Cedar Boulevard – 2 nd Floor Pittsburgh, PA 15228 Phone: 412-343-4519
ENGINEER:	The Gateway Engineers, Inc. Dennis J. Flynn, P.E., Project Manager 100 McMorris Road Pittsburgh, PA 15205 Phone: 412-409-2380 Fax: 412-921-9960
POOL ASSOCIATE:	Counsilman-Hunsaker Maddie Monroe 3636 S Geyer Road Suite 100 Saint Lous, MO 63127 Phone: 314-894-1245
ELECTRICAL ASSOCIATE:	Sulosky Design Group LLC Steve Sulosky 830 Wildcat Way Latrobe, PA 15650 Phone: 814-659-6375 Fax: 412-921-9960

PROJECT DIRECTORY

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NOTICE TO BIDDERS

MUNICIPALITY OF MT. LEBANON OF ALLEGHENY COUNTY, PENNSYLVANIA

Sealed Proposals will be received by the Mt. Lebanon Commission at the Municipal Building, 710 Washington Road, Pittsburgh, Pennsylvania 15228 until **11:00 AM on Tuesday, December 3, 2024.**

All proposals shall be delivered to the attention of Mr. Rudy Sukal – Director of Public Works before **11:00 am. prevailing time, Tuesday, December 3, 2024**, and the same will be publicly opened and read at that time at the Municipal Building Commission Chambers located at 710 Washington Road, Pittsburgh, PA 15228 for the following projects:

MT. LEBANON SANITARY AND STORM SEWER LINING CONTRACT

This project involves sanitary and storm sewer repairs including but not limited to: sanitary and storm sewer full length manhole to manhole lining CIPP repairs; spot lining CIPP repairs; pre and post CCTV inspections; internal reinstatement of active service laterals; cutting of protruding taps; traffic control; resident and business notifications; and site restorations, complete in place. All traffic control and restoration of disturbed areas are also included in this project.

Proposals shall be delivered in a sealed envelope that is clearly marked on the outside with the appropriate wording **“MT. LEBANON SANITARY AND STORM SEWER LINING CONTRACT”**.

Pennsylvania Prevailing wage rates will be required to be paid on the Lining Contract.

MT. LEBANON SANITARY AND STORM SEWER POINT REPAIR CONTRACT

This project involves sanitary and storm sewer point repairs including, but not limited to: sanitary and storm sewer excavation point repairs; replacement of wye and lateral pipe; MH installation; location and adjustment of buried sanitary and storm sewer manholes; invert replacement; CCTV verification of the repair locations; and the post repair NASSCO CCTV. All traffic control, notification, and restoration of disturbed areas are also included in the project. This is a multi-year contract, the Municipality, at its sole discretion, reserves the right to renew this Contract for the 2026 and 2027 calendar years.

Proposals shall be delivered in a sealed envelope that is clearly marked on the outside with the appropriate wording **“MT. LEBANON SANITARY AND STORM SEWER POINT REPAIR CONTRACT”**.

Pennsylvania Prevailing wage rates will be required to be paid on the Point Repair Contract.

MT. LEBANON STORM AND SANITARY SEWER TELEVISING AND CLEANING CONTRACT

This project includes storm and sanitary sewer televising investigations of various size pipe, including the cleaning (light and heavy), plugging/bypass pumping and manhole inspections throughout the Municipality. All traffic control and resident notification in work locations are also included in this project. The Municipality may add or subtract various sanitary or storm sewers throughout the Contract. This is a multi-year contract, the Municipality reserves the right to renew this Contract for the 2026 and 2027 calendar years.

Proposals shall be delivered in a sealed envelope that is clearly marked on the outside with the appropriate wording **“MT. LEBANON STORM AND SANITARY SEWER TELEVISING AND CLEANING CONTRACT”**.

Pennsylvania Prevailing wage rates will **not** be required on the Storm and Sanitary Sewer Televising and Cleaning Contract.

MT. LEBANON BEGGS SNYDER SANITARY SEWER REPAIRS CONTRACT

This project involves sanitary sewer repairs including but not limited to: sanitary sewer replacement and lowering to correct an exposed sanitary sewer segment within a stream; concrete encasement of a sanitary sewer stream crossing; stream restoration; following permit requirements for working within the stream; sanitary sewer full length manhole to manhole lining CIPP repairs; sanitary sewer manhole replacements; installation of drop connections; sanitary sewer manhole rehabilitation; traffic control; resident and business notifications; and site restoration, complete in place. All traffic control and restoration of disturbed areas are also included in this project.

Proposals shall be delivered in a sealed envelope that is clearly marked on the outside with the appropriate wording **“MT. LEBANON BEGGS SNYDER SANITARY SEWER REPAIRS CONTRACT”**.

This Project was financed in part by a PA Small Water and Sewer program grant from the Commonwealth Financing Authority of Pennsylvania.

Pennsylvania Prevailing wage rates **will** be required to be paid on the Beggs Snyder Sanitary Sewer Repairs Contract.

MT. LEBANON 2025 CORRECTIVE ACTION REPAIRS CONTRACT

This project involves sanitary sewer repairs including, but not limited to: sanitary sewer full length manhole to manhole lining CIPP repairs; pre and post CCTV inspections; internal reinstatement of active service laterals; cutting of protruding taps; sanitary sewer manhole rehabilitation; traffic control; resident and business notification; and site restoration, complete in place. All traffic control and restoration of disturbed areas are also included in this project.

Proposals shall be delivered in a sealed envelope that is clearly marked on the outside with the appropriate wording **“MT. LEBANON 2025 CORRECTIVE ACTION REPAIRS CONTRACT”**.

Pennsylvania Prevailing wage rates **will** be required to be paid on the 2025 Corrective Action Repairs Contract.

MT. LEBANON POOL FILTRATION REPLACEMENT CONTRACT

This project involves demolition and replacement of the pool filtration system; electrical services; installation of a pool surge tank; installation of liquid chlorine tanks and configuration of chlorine application systems; internal building configuration for placement of equipment including CMU block wall demolition and internal door installation; all necessary plumbing appurtenances for connection of new filter system, surge tank, and equipment to the existing system; and site restoration, complete in place.

A non-mandatory pre-bid meeting will be held on November 19, 2024 at 10:30 am at the Mt. Lebanon Pool and Recreation facility.

A Proposals shall be delivered in a sealed envelope that is clearly marked on the outside with the appropriate wording "**MT. LEBANON POOL FILTRATION REPLACEMENT CONTRACT**".

Pennsylvania Prevailing wage rates will be required to be paid on the Pool Filtration Replacement.

Copies of all the above Drawings, Specifications, Instructions to Bidders, General Conditions, Forms of Proposals and Agreement are on file and open to public inspection at the office of The Gateway Engineers, Inc., 100 McMorris Road, Pittsburgh PA 15205 where sets of said documents may be obtained upon payment of \$25.00 per set for the hard copy. No refund will be made for the return of any documents. An additional \$10.00 will be required for each set of plans if they are to be mailed. Each plan set must be purchased separately. Electronic files may be requested at no cost. Please send e-mail requests to Christa Klingensmith (cklingensmith@gatewayengineers.com).

For all the above contracts, Performance and Labor and Material Payment Bonds, along with Public Liability and Property Damage Certificates of Insurance in the amounts specified, as well as Certificates of Workman's Compensation must be filed with the executed Agreement.

For all the above contracts, proposals to receive consideration must be accompanied by a Certified Check or Bidder's Bond from a Surety Company authorized to do business in Pennsylvania, made to the order of Municipality of Mt. Lebanon, Allegheny County, Pennsylvania in an amount equal to ten percent (10%) of the total amount of the Proposal as a guarantee that, if the Proposal is accepted, the successful Bidder will enter into an Agreement within 15 days after Notice of the Award of the Contract.

The Municipality of Mt. Lebanon reserves the right to waive any formalities or to reject any or all Proposals. If more time is necessary for the determination of the lowest responsible bidder, the Municipality of Mt. Lebanon reserves the right to award the Contract later but not exceeding sixty (60) days from the date Bids were submitted.

By: Keith McGill
Municipal Manager

Date of Publication

November 7th, 2024

BID FORM AND PROPOSAL

ARTICLE 1 – BID RECIPIENT

The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – PROPOSAL FOR:

MT. LEBANON POOL FILTRATION REPLACEMENT CONTRACT

BASE BID:

This project involves demolition and replacement of the pool filtration system; electrical services; installation of a pool surge tank; installation of liquid chlorine tanks and configuration of chlorine application systems; internal building configuration for placement of equipment including CMU block wall demolition and internal door installation; all necessary plumbing appurtenances for connection of new filter system, surge tank, and equipment to the existing system; and site restoration, complete in place.

ADD ALTERNATE No. 1:

Add Alternate No. 1 includes installation of a new elevated slab within the pool mechanical room, complete in place.

ADD ALTERNATE No. 2:

~~Add Alternate No. 2 includes installation of new lighting fixtures in the filter room including all necessary electric connections as shown on the site plan, complete in place.~~

ARTICLE 3 – TIME OF COMPLETION

Bidder agrees that the Work will be substantially complete by April 4, 2025 as provided in Article 4 of the General Conditions, and will be completed and ready for final payment in accordance with Article 15 of the General Conditions by April 25, 2025 or liquidated damages in the amount of \$500.00 per calendar day will be charged. As actual damages for any delay in completion are impossible to compute and ascertain with certainty as a basis of recovery by the Municipality of Mt. Lebanon of actual damages, the Contractor and its Surety shall be liable to the Municipality of Mt. Lebanon the sum of \$500.00 as fixed and agreed for each business day of delay until the Work is complete and accepted. Such liquidated damages are intended to represent actual damages and are not intended as a penalty. Contractor shall pay to Owner without limiting Owner's right to terminate this Agreement for default as provided elsewhere herein.

Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the Contract Times.

ARTICLE 4 – BASIS OF BID

Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

BIDDING SCHEDULE BASE BID

<u>Item No.</u>	<u>Item Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	Demolition and Replacement of the pool filtration system, complete in place	L.S.	1		\$ _____

TOTAL LUMP SUM BASE BID

PRICES (numbers)

\$ _____

TOTAL LUMP SUM BASE BID

PRICES (written)

BIDDING SCHEDULE ADD ALTERNATE BID No. 1 –ELEVATED SLAB OPTION

<u>Item No.</u>	<u>Item Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	Installation of an Elevated Slab, complete in place	L.S.	1		\$ _____

TOTAL ADD ALTERNATE BID

No. 1 (numbers)

\$ _____

TOTAL ADD ALTERNATE BID

No. 1 (written)

BIDDING SCHEDULE
ADD ALTERNATE BID No. 2 - LIGHTING FIXTURES

<u>Item No.</u>	<u>Item Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
+ 1	Installation of Lighting Fixtures, complete in place	L.S.	+		\$ _____

TOTAL ADD ALTERNATE BID

No. 2 (numbers) \$ _____

TOTAL ADD ALTERNATE BID

No. 2 (written) _____

Additional Materials/Work

Unit prices as hereafter listed for Additional Materials/Work shall be used as a basis for adjustment of the Contract amount for addition to or deletion from the amount of work on the project, as stated in the description on page 5 of the proposal form. Quantities listed shall indicate the amounts to be included in the furnishing and installation of the additional materials/work to that shown on the drawings, which is to be completed within the Contract time specified in Article 3.

Installation of Concrete Sidewalk, complete in place S.F. 100 \$ _____

Installation of Heavy-Duty Concrete Paving, complete in place S.F. 100 \$ _____

Installation of Chain Link Fence, complete in place L.F. 50 \$ _____

Installation of 3" Surge Tank Pipe per plans, complete in place L.F. 25 \$ _____

Installation of 4" Drain Sump per plans, complete in place L.F. 25 \$ _____

Installation of 8" Main Drains per plans, complete in place L.F. 25 \$ _____

Installation of 10" Return Line per plans, complete in place L.F. 25 \$ _____

Installation of 12" Surge Tank Pipe per plans, complete in place L.F. 25 \$ _____

Installation of 18" Main Drain Line per plans, complete in place L.F. 25 \$ _____

~~Installation of Type "A" Light Fixture Units, complete in place~~ EA. 2 \$ _____

<u>Installation of GFI and Weather Resistant Duplex Receptacle Units, complete in place</u>	EA.	3	\$ _____
<u>Installation of Connections for 120V, Single Phase HVAC/Pool Equipment, 30 amperes, utilizing #10AWG conductors and disconnecting means complete in place</u>	EA.	2	\$ _____
<u>Installation of Connections for 208V, Three Phase HVAC/Pool Equipment, 30 amperes, utilizing #10AWG conductors and disconnecting means complete in place</u>	EA.	2	\$ _____
Installation of Interior Concrete Slab, complete in place	S.F.	100	\$ _____
Installation of Concrete Seat Wall, complete in place	S.F.	25	\$ _____
Replacement of Concrete Block Wall, complete in place	S.F.	50	\$ _____

Bidder acknowledges that the Lump Sum Price includes an amount considered by Bidder to be adequate to cover the Contractor's overhead and profit for each separately identified item. Additional quantities of each item are included above to provide the basis of the Lump Sum Bid. If the above additional items are not used they will be subtracted from the total Contract amount.

All specified cash allowances are included in the price(s) set forth above and have been computed in accordance with Article 13 of the General Conditions.

The Lump Sum Prices have been computed in accordance with Article 13 of the General Conditions.

The Owner shall make the award to sole contractor who is determined to be the lowest responsible bidder for the selected Base and Add Alternate bids. The notice of award as set forth on Page (00510-1) shall specify the base bid and add alternatives (if any) awarded by the Owner. After issuance of the Notice of Award (00510-1) the Owner expressly reserves the right to award at any time thereafter any add alternatives not otherwise awarded under the Notice of Award (00510-1).

Additional Items/Work:

- A. **The Base Bid shall include the amounts for the furnishing and installation of Additional Materials/Work within the Contract time, to that shown on drawings. The cost for additional items as listed shall be included in the Base Bid sum.** The Owner may or may not elect to have this work performed. No material and/or labor shall be supplied until specifically requested by the Owner. Work described with the additional items that is not performed will be deducted from the Project total at the end of the Project, according to the Additional Unit Price indicated by the Contractor on the Bid Form. The Owner's election to have any of the following work performed, does not constitute an extension of time to the Contract.

Note: Additional amounts of work as specified will not include any area damaged by the Contractor. Any areas damaged by the Contractor's activities shall be repaired by the Contractor at no cost to the Owner.

- B. Additional Unit prices as listed shall be used as a basis for adjustment of the Contract amount for addition to or deletion from the amount of work on the project. Unit prices stated on the Proposal/Bid Form by the Contractor shall be added to or deducted from the Contract Sum only if directed to do so by the Owner and/or the Engineer. Any work described as a unit price item for additional work shall not be considered as part of the Contract unless so indicated by Change Order during the performance of the work.
- C. Additional Unit prices shall include costs of all associated testing as specified for work as listed, all bonds, insurances, overhead, profit and supervision, as well as, shipping and handling, mobilization and/or de-mobilization, and Contract time

ARTICLE 5 – BIDDER'S ACKNOWLEDGEMENTS

Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for ninety (90) days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of the Owner.

In the event the low bidder is more than 15% lower than the second low bidder, the bonding company for the low bidder shall supply a signed and notarized statement that they will provide the proper bonding for the project. This statement shall be supplied prior to award.

ARTICLE 6 – BIDDER'S REPRESENTATIONS

In submitting this Bid, Bidder represents that:

- A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

<u>Addendum No.</u>	<u>Addendum Date</u>
_____	_____
_____	_____
_____	_____

- B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Bidder is familiar with and has satisfied itself as to all Federal, State and Local Laws and Regulations that may affect cost, progress and performance of the Work.
- D. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.
- E. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and

- within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- F. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
 - G. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.

- H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding and Contract Documents and any attached reports, and certifies the written resolution thereof by Engineer is acceptable to Bidder unless further clarification is requested.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work for which this Bid is submitted.
- J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.
- K. Bidder will submit written evidence of its authority to do business in the state where the Project is located not later than the date of its execution of the Agreement.
- L. All notices, demands, requests, instructions, approvals, proposals, and claims must be in writing.

ARTICLE 7 – BIDDER’S CERTIFICATION

Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 7.D:
 - 1. “corrupt practice” means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;
 - 2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 8 – ATTACHMENTS TO THIS BID

The following documents are attached to and made a condition of this Bid:

- A. Required Bid security in the form of a Certified Check or Surety Company Bond in the amount of 10% in favor of the Municipality of Mt. Lebanon, as a proposal deposit which, it is understood, will be forfeited in case of failure to comply with the requirements and provisions of this proposal.
- B. List of Proposed Subcontractors (provided by the Bidder)
- C. List of Proposed Suppliers (provided by the Bidder)
- D. Non-Collusion Affidavit
- E. Public Works Employment Verification Form
- F. Statement of Bidder’s Qualifications which includes examples of three (3) similar projects within the last five (5) years.

ARTICLE 9 – DEFINED TERMS

The terms used in this Bid with initial capital letters have meanings stated in the Instruction to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 10 – BID SUBMITTAL

This Bid submitted by:

If Bidder is:

An Individual

Name (typed or printed): _____

By: _____ (SEAL)
(Individual's signature)

Doing business as: _____

A Partnership

Partnership Name: _____ (SEAL)

By: _____
(Signature of general partner)

Name (typed or printed): _____

A Corporation

Corporation Name: _____ (SEAL)

State of Incorporation: _____
Type (General Business, Professional, Service, Limited Liability): _____

By: _____
(Signature)

Name (typed or printed): _____

Title: _____ (CORPORATE SEAL)

Attest _____

Date of Authorization to do business in _____ is ____ / ____ / ____.

Bidder's Business Address _____

_____ + _____

Telephone No. _____ Fax No. _____

E-mail address: _____

Submittal Date: _____, 20____.

BID BOND

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

BID

Bid Due Date:

Description (*Project Name—Include Location*):

BOND

Bond Number:

Date:

Penal sum

_____ \$ _____ (Words) _____ (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER**SURETY**

Bidder's Name and Corporate Seal	(Seal)	Surety's Name and Corporate Seal	(Seal)
By: _____ Signature	By: _____	Signature (Attach Power of Attorney)	

Print Name _____

Print Name _____

Title _____

Title _____

Attest: _____
Signature

Attest: _____
Signature

Title _____

Title _____

Note: Addresses are to be used for giving any required notice.

Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2 All Bids are rejected by Owner, or
 - 3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

NON-COLLUSION AFFIDAVIT

Contract/Bid No.

State of _____ :
:S.S.

County of :

and that I am authorized to make this affidavit on behalf of my firm, and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

- (1) The price(s) and amount of this bid have been arrived at independently and without consultation, communication or agreement with any other contractor, bidder or potential bidder.
 - (2) Neither the price(s) nor the amount of this bid, and neither the approximate price(s) nor approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before bid opening.
 - (3) No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, or to submit a bid higher than this bid, or to submit any intentionally high or noncompetitive bid or other form of complementary bid.
 - (4) The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid.

(5) _____, its affiliate's subsidiaries,
(Name of my firm)
officers, directors and employees are not currently under investigation by any governmental agency and have not in the last four years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as follows:

I state that _____ understands and acknowledges
(Name of my firm)
that the above representations are material important, and will be relied on by

(Name of public entity)
in awarding the contract(s) for which this bid is submitted. I understand and my firm
understands that any misstatement in this affidavit is and shall be treated as fraudulent

concealment from _____ of the true facts relating
(Name of public entity)
to the submission of bids for this contract.

(Name)

(Title)

SWORN TO AND SUBSCRIBED

BEFORE ME THIS DAY

OF 20 .

Notary Public My Commission Expires:

(Seal)



COMMONWEALTH OF PENNSYLVANIA
PUBLIC WORKS EMPLOYMENT VERIFICATION FORM

Date _____

Business or Organization Name (Employer) _____

Address _____

City _____ State _____ Zip Code _____

Contractor Subcontractor (check one)

Contracting Public Body _____

Contract/Project No _____

Project Description _____

Project Location _____

As a contractor/subcontractor for the above referenced public works contract, I hereby affirm that as of the above date, our company is in compliance with the Public Works Employment Verification Act ('the Act') through utilization of the federal E-Verify Program (EVP) operated by the United States Department of Homeland Security. To the best of my/our knowledge, all employees hired post January 1, 2013 are authorized to work in the United States.

It is also agreed to that all public works contractors/subcontractors will utilize the federal EVP to verify the employment eligibility of each new hire within five (5) business days of the employee start date throughout the duration of the public works contract. Documentation confirming the use of the federal EVP upon each new hire shall be maintained in the event of an investigation or audit.

I, _____, authorized representative of the company above, attest that the information contained in this verification form is true and correct and understand that the submission of false or misleading information in connection with the above verification shall be subject to sanctions provided by law.

Authorized Representative Signature

INSTRUCTIONS TO BIDDERS

ARTICLE 1 – DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Issuing Office* – The office from which the Bidding Documents are to be issued.
 - B. *Successful Bidder* – The lowest, qualified, responsible bidder to whom the Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award.

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

- 2.01 Complete sets of the Bidding Documents in the number and for the deposit sum, if any, stated in the Notice to Bidders may be obtained from the Issuing Office. The deposit is non-refundable.
- 2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.
- 2.04 During the bidding period, Bidders may be furnished with Addenda for additions to or alterations of the plans or specifications which shall be included in the work covered by the Proposal and become part of the Contract Documents. Such Addenda shall be signed by the Bidder and submitted with the Bid.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within five days of Owner's request, Bidder shall submit (a) written evidence establishing its qualifications such as financial data, previous experience, and present commitments, and (b) the following additional information:
 - A. Evidence of Bidder's authority to do business in the state where the Project is located.
 - B. Bidder's state or other contractor license number, if applicable.
 - C. Subcontractor and Supplier qualification information; coordinate with provisions of Article 12 of these Instructions, "Subcontractors, Suppliers, and Others."
- 3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.
- 3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.
- 3.04 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.
- 3.05 If the Owner requires pre-qualification for the Project, the Bidder shall include the pre-qualification documentation for himself/herself/theirselves and his/her/their subcontractors and suppliers in the Bid documents.

ARTICLE 4 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

4.01 *Site and Other Areas*

A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

4.02 *Existing Site Conditions*

A. Subsurface and Physical Conditions; Hazardous Environmental Conditions

1. The Supplementary Conditions identify:
 - a. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.
 - b. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
 - c. reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
 - d. Technical Data contained in such reports and drawings.
2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.
3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

B. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site are set forth in the Contract Documents and are based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

C. No claims for additional compensation will be allowed because of obstructions or conditions on the location of the work which may add to the difficulties or costs of construction, even though such obstructions or conditions are not shown on the Contract Plans. The bidder shall make his own investigation to determine all underground structures and utility lines.

D. Adequacy of Data: Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 5.03, 5.04, and 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 5.06 of the General Conditions.

Instructions to Bidders

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4.03 *Site Visit and Testing by Bidders*

- A. Bidder shall conduct the required Site visit during normal working hours, and shall not disturb any ongoing operations at the Site.
- B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.
- D. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
- E. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.04 *Owner's Safety Program*

- A. Site visits and work at the Site may be governed by an Owner safety program. As the General Conditions indicate, if an Owner safety program exists, it will be noted in the Supplementary Conditions.

4.05 *Other Work at the Site*

- A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.
- 4.06 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 5 – BIDDER'S REPRESENTATIONS

5.01 It is the responsibility of each Bidder before submitting a Bid to:

- A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;
- B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;

- C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;
- D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings;
- E. consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs;
- F. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
- G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
- H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;
- I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and
- J. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 6 – PRE-BID CONFERENCE

- 6.01 A pre-Bid conference may be held in accordance with the requirements of the Bidding Documents and the Notice to Bidders. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all parties recorded as having received the Bidding Documents. Questions received less than seven days prior to the date for opening of Bids may not

be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

- 7.02 Addenda may be issued to clarify, correct, supplement, or change the Bidding Documents.

ARTICLE 8 – BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 10 percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a certified check, bank money order, or a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.
- 8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract Documents, furnished the required contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.
- 8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.
- 8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within seven days after the Bid opening.

ARTICLE 9 – CONTRACT TIMES

- 9.01 The number of days within which, or the dates by which, the Work is to be substantially completed and ready for final payment are set forth in the Bid Form and in the Agreement.

ARTICLE 10 – LIQUIDATED DAMAGES

- 10.01 Provisions for liquidated damages, if any, for failure to timely attain Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Project Specifications and Agreement.

ARTICLE 11 – SUBSTITUTE AND “OR-EQUAL” ITEMS

- 11.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, and those “or-equal” or substitute or materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Engineer as an “or-equal” or substitute unless written request for approval has been submitted by Bidder and has been received by Engineer at least 15 days prior to the date for receipt of Bids. Each such request shall comply with the requirements of Paragraphs 7.04 and 7.05 of the General Conditions. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner.
- 11.02 All prices that Bidder sets forth in its Bid shall be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as

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supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder’s sole risk.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 12.01 Subsequent to the submittal of the Bid, Owner may not require the Successful Bidder or Contractor to retain any Subcontractor, Supplier, or other individual or entity against which Contractor has reasonable objection.
- 12.02 The apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of the Subcontractors or Suppliers proposed for the Work. If requested by Owner, such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, or other individual or entity. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder shall submit a substitute, Bidder’s Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.
- 12.03 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, or other individuals or entities. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.06 of the General Conditions.

ARTICLE 13 – PREPARATION OF BID

- 13.01 The Bid Form is included with the Bidding Documents.
 - A. All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.
 - B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words “No Bid” or “Not Applicable.”
- 13.02 A Bid by a corporation shall be executed in the corporate name by a corporate officer (whose title must appear under the signature). The corporate address and state of incorporation shall be shown. The corporate seal shall be affixed and attested by the corporate secretary or an assistant corporate secretary.
- 13.03 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature). The official address of the partnership shall be shown below the signature
- 13.04 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person. The state of formation of the firm and the official address of the firm shall be shown.
- 13.05 A Bid by an individual shall show the Bidder’s name and official address.

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- 13.06 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 13.07 All names shall be printed in ink below the signatures.
- 13.08 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 13.09 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 13.10 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 – BASIS OF BID

- 14.01 *Unit Price and Lump Sum*
 - A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form. The Proposal may be a combination of unit price and lump sum items.
 - B. The “Bid Price” (sometimes referred to as the extended price) for each unit price Bid item will be the product of the “Estimated Quantity” (which Owner or its representative has set forth in the Bid Form) for the item and the corresponding “Bid Unit Price” offered by the Bidder. The total of all unit price Bid items will be the sum of these “Bid Prices”; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.
 - C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.
 - D. The Bid price shall include such amounts as the Bidder deems proper for overhead and profit on account of cash allowances, if any, named in the Contract Documents as provided in Paragraph 13.02 of the General Conditions.

ARTICLE 15 – SUBMITTAL OF BID

- 15.01 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation “BID ENCLOSED.”
- 15.02 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

- 16.01 A Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

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- 16.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 16.01 and submit a new Bid prior to the date and time for the opening of Bids.
- 16.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.
- 16.04 To withdraw a Proposal, the Bidder or his agent must personally appear at the office of the Owner with a written request to withdraw his Proposal. At the time set for opening of bids the withdrawn Proposal will be returned unopened to the Bidder. Apparent low Bidders who can prove that clerical or mathematical errors caused their bid to be lower than intended can withdraw their Proposal within two business days from the time of bid opening, in accordance with PA Act #4 - 1974, without losing their Bid Security; however, any such bidder withdrawing his Proposal will not be permitted to rebid on the project, and may also be subject to paying the costs of resubmitting the project to bidding, in accordance with Pennsylvania legislation. Proposals may be withdrawn after the bid opening if award has not been made within sixty days, or as otherwise indicated in the Advertisement for Bids.

ARTICLE 17 – OPENING OF BIDS

- 17.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.
- 17.02 If the bids are opened privately, an abstract of the same information will be made available to Bidders at the discretion of the Owner.

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

- 19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, then the Owner will reject the Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder.
- 19.02 More than one Bid for the same Work from an individual or entity under the same or 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 that Bidder has an interest.
- 19.03 If Owner awards the contract for the Work, such award shall be to the responsible Bidder submitting the lowest responsive Bid.
- 19.04 Evaluation of Bids

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- A. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.
 - B. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.
- 19.05 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.
- 19.06 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.
- 19.07 On a Lump Sum Proposal or a partial Lump Sum Proposal, if the bidding schedule includes a supplementary schedule of unit prices for fixing cost basis for changes, the Owner reserves the right to reject any or all such supplemental unit prices which it deems to be excessive or unreasonable.
- 19.08 Where Bids are received on the basis of a Lump Sum Value, the low Bidder shall submit an itemized schedule of values as the basis of payment for monthly payments from the Owner. Said schedule shall be submitted to the Owner for review and approval before award of the Contract. Copies of the schedule shall become part of the Contract Document.
- 19.09 The effective amount of each proposal (other than Lump Sum Bids) will be determined on the basis of the approximate quantities given on the Proposal Form. By setting up approximate quantities on the Proposal Form, there is no agreement, expressed or implied, that the actual amount of work or materials to be required under the Contract will correspond with such quantities, but the right is reserved at any time after the award of a Contract to increase or decrease any or all of the items, or to eliminate entirely any item or items, or part or parts of the Contract project. Award of a Contract will be made to the lowest responsible bidder, basing lowness of the bid on the summation of the extensions of the unit bid prices for the approximate quantities given.

ARTICLE 20 – BONDS AND INSURANCE

- 20.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by required bonds and insurance documentation.

ARTICLE 21 – SIGNING OF AGREEMENT

- 21.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Agreement (and any bonds and insurance documentation required to be delivered by the Contract Documents) to Owner. Within ten days thereafter, Owner shall deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.
- 21.02 In case the bidder shall fail to do so, he will be deemed to have abandoned the Contract and the Owner may thereupon re-advertise or otherwise award said Contract and recover the losses sustained by such abandonment out of the Bidder's Surety or Certified Check.

ARTICLE 22 – WRITTEN NOTICE TO PROCEED

- 22.01 Should the Contractor fail to commence work within the time specified in the Contract, the Engineer may give written notice to the Contractor to begin work within ten days. Should the Contractor fail to commence within the ten days, the Contractor shall be considered in default and the Owner may proceed with the remedy prescribed in Article 16 of the General Conditions of the Contract.

ARTICLE 23 – MINIMUM WAGE RATES (WHERE APPLICABLE)

- 23.01 The minimum wage rates for each craft or classification on all workmen needed to perform this contract during the anticipated term hereof may be governed by the "Pennsylvania Prevailing Wage Act" (43 P.S. 165_1 to 165_17) or Davis-Bacon Wage Rates. The Contractor's attention is directed to these statutes so that the applicable provisions of the Act shall be strictly adhered to in the performance of this Contract. Failure to adhere to the applicable provisions of the Act shall be sufficient grounds for the Owner to declare this Contract in default or to terminate this Contract. The minimum wage rates applicable to this Contract, as established and to the extent available are attached hereto.

ARTICLE 24 – MAINTENANCE BOND

- 24.01 Upon completion of the Contract and prior to the final payment a Maintenance Bond shall be furnished by the Contractor to the Owner as a guarantee against defective workmanship and materials.
- 24.02 The Maintenance Bond shall be in an amount equal to 50% of the Final Contract Value for a period of two (2) years, unless otherwise specified in the Project Specifications.

ARTICLE 25 – PENNSYLVANIA HUMAN RELATIONS ACT – NON-DISCRIMINATION CLAUSE

- 25.01 Contractor shall not discriminate against any employee, applicant for employment, independent contractor or any other person because of race, color, religious creed, ancestry, national origin, age or sex.
- Contractor shall take affirmative action to ensure that applicants are employed, and that employees or agents are treated during employment, without regard to their race, color, religious creed, ancestry, national origin, age or sex. Such affirmative action shall include, but is not limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training.
- Contractor shall post in conspicuous places, available to employees, agents, applicants for employment and other persons, a notice setting forth the provisions of this nondiscrimination clause.
- 25.02 Contractor shall in advertisements or requests for employment placed by it or on its behalf; state that all qualified applicants will receive consideration for employment without regard to race, color, religious creed, ancestry, national origin, age or sex.
- 25.03 Contractor shall send each labor union or workers' representative with which it has a collective bargaining agreement or other contract or understanding, a notice advising said labor union or workers' representative of its commitment to this nondiscrimination clause. Similar notice shall be sent to every other source of recruitment regularly utilized by Contractor.
- 25.04 It shall be no defense to a finding of noncompliance with the Contract Compliance Regulations issued by the Pennsylvania Human Relations Commission or this non-discrimination clause that

Instructions to Bidders

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Contractor had delegated some of its employment practices to any union, training program or other source of recruitment which prevents it from meeting its obligations. However, if the evidence indicates that the Contractor was not on notice of the third party discrimination or made a good faith effort to correct it; such factor shall be considered in mitigation in determining appropriate sanctions.

- 25.05 Where the practices of a union, or of any training program or other source of recruitment, will result in the exclusion of minority group persons, so that Contractor will be unable to meet its obligations under the Contract Compliance Regulations issued by the Pennsylvania Human Relations Commission, or this nondiscrimination clause, Contractor shall then employ and fill vacancies through other nondiscriminatory employment procedures.
- 25.06 Contractor shall comply with the contract compliance Regulations of the Pennsylvania Human Relations Commission (16 Pa. Code Chapter 49) and with all laws prohibiting discrimination in hiring or employment opportunities. In the event of Contractor's noncompliance with the nondiscrimination clause of this contract or with any such laws, this contract may, after hearing and adjudication, be terminated or suspended, in whole or in part, and Contractor may be declared temporarily ineligible for further Commonwealth contracts, and such other sanctions may be imposed and remedies invoked as provided by the Contract Compliance Regulations.
- 25.07 Contractor shall furnish all necessary employment documents and records to, and permit access to its books, records and accounts by the Owner or government agency and the Human Relations Commission, for purposes of investigation to ascertain compliance with the provisions of the Contract Compliance Regulations, pursuant to Section 49.35 of these Regulations. If Contractor does not possess documents or records reflecting the necessary information requested, it shall furnish such information on reporting forms supplied by the contracting agency or the Commission.
- 25.08 Contractor shall actively recruit minority subcontractors or subcontractors with substantial minority representation among their employees.
- 25.09 Contractor shall include the provisions of this nondiscrimination clause in every subcontract, so that such provisions will be binding upon each subcontractor.
- 25.10 The terms used in this non-discriminating clause shall have the same meaning as in the Contract Compliance Regulations issued by the Pennsylvania Human Relations Commission, 16 Pa. Code Chapter 49.
- 25.11 Contractor obligations under this clause are limited to the Contractor's facilities within Pennsylvania, or, where the contract is for purchase of goods manufactured outside of Pennsylvania, the facilities at which such goods are actually produced.

ARTICLE 26 – BONDS AND INSURANCE

The successful bidder shall comply with all of the provisions of Article 6 of the General Conditions relating to the Contractor and any other insurance requirements specified in the Project Specifications. In addition, unless otherwise provided as a special condition, it shall be the successful bidder's, not the owner's, responsibility to purchase the property insurance required by and to comply with all of the provisions of Article 6.05 of the General Conditions. With regard to the amounts of insurance which the successful bidder will be required to give evidence of provided in accordance with Article 6 of the General Conditions of the Contract, the following minimums apply:

- 26.01 Worker's Compensation and Employers Liability (Including any applicable Voluntary Compensation, U.S Longshoremen's and Harbor Worker's Act compliance & All States Coverage)
 - Statutory Requirements
 - Employer's Liability Coverage
 - \$1,000,000 Each Accident
 - \$1,000,000 Disease - Policy Limit

Instructions to Bidders

- \$1,000,000 Disease - Each Employee
- 26.02 Commercial General Liability (Including coverage for explosion, collapse and underground damage, Blanket Contractual Liability, Owners & Contractors Protective Liability and Personal Injury Liability)
- | | |
|-------------|-------------------------------|
| \$2,000,000 | General Aggregate |
| \$2,000,000 | Products - Comp/Ops Aggregate |
| \$1,000,000 | Personal & Advertising Injury |
| \$1,000,000 | Each Occurrence |
| \$ 100,000 | Fire Damage (Any One Fire) |
| \$ 5,000 | Med Pay (Any One Person) |
- 26.03 Business Auto Liability (Including Owned, Hired and Non-Owned Automobiles)
- | | |
|-------------|----------------------------|
| \$1,000,000 | Combined Single Limit |
| | Or |
| \$1,000,000 | Bodily Injury per Person |
| \$1,000,000 | Bodily Injury per Accident |
| \$1,000,000 | Property Damage |
- 26.04 Commercial Umbrella Liability Coverage
- | | |
|-------------|------------------|
| \$1,000,000 | Each Occurrence |
| \$1,000,000 | Aggregate Amount |
- 26.05 *Indemnification* The Contractor shall indemnify and save harmless the Owner and the Engineer against all liability for all claims, 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) for injury or damages arising out of an occurrence to persons, including wrongful death, and to property, which may arise from operations under this Contract, whether such operations be by himself or any subcontractor or anyone directly or indirectly employed by either of them, including sole negligence of the Owner, his employees, or agents, during the period from the date of commencement of the work until the completion of the contract. The Owner and Engineer shall be listed as 'Additional Insureds' on the Certificate of Insurance provided by the Contractor.
- 26.06 *Subrogation Clause* All policies must include the following Waiver of Subrogation Clause: "The issuer waives any right of Subrogation against the Owner, its departments, its officers, agents and employees, for any claim which might arise by reason of any payment under the policies obtained by the Contractor."
- 26.07 *Notice of Policy Changes* All policies must provide for 30 days written notice to the Owner by endorsement to the policies and shown on the Certificate of Insurance prior to any cancellation or modification of the policies.
- 26.08 *Certificates of Insurance.* The Contractor shall provide certificates of insurance in compliance with Articles 26.01 through 26.07 of these instructions evidencing at a minimum the following:
- (1) Name and Address of the producer (insurance agent or broker).
 - (2) Name and Address of insured (contractor).
 - (3) Name and Address of carrier (insurance company).
 - (4) Name and Address of Certificate Owner.
 - (5) Effective dates and expiration dates of each insurance coverage..
 - (6) Limits of coverage and policy numbers

Instructions to Bidders

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[REDACTED], 20[REDACTED]

[REDACTED] OF [REDACTED]
County, PA

REQUEST FOR PROPOSALS TO BE RECEIVED ON [REDACTED], 20[REDACTED]

FOR: [REDACTED]

ADDENDUM NO. [REDACTED]

All Contractors who may be Bidding on the work under this Contract shall read and observe this Addendum and any future Addenda.

Every Bidder shall note that while certain requirements in this Addendum may be specifically noted as applying to a particular page and section in the Specifications or to a Plan Number, such changes shall apply also to any other Page or Plan where such change is relevant.

All Contractors who are Bidding on this work shall take cognizance of the revisions, changes, additions and deletions shown in this and future Addenda and shall provide for the same in their Bid. The Addenda shall be attached to the INSIDE FRONT COVER OF THE BOOK OF SPECIFICATIONS when submitting their Bid. Receipt of this Addendum must also be indicated on the Proposal Form.

1.

2.

ACKNOWLEDGMENT

The Bidder hereby acknowledges receipt of the foregoing ADDENDUM NUMBER _____

(Name of Bidder) _____
(Signature) _____

(Date) _____
(Title of Officer) _____

Addendum

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NOTICE OF AWARD

Date

C-

Contractor

Address 1

Address 2

City, State, Zip

CONTRACT FOR:

Project description from Ad

You are notified that Owner has accepted your Bid dated Bid Date for the above Contract, and that you are the Successful Bidder and are awarded the Contract.

The Contract Price of your Contract is Dollar amount in Words Dollars (\$ Dollar amount in numbers). (on the basis of the Unit Prices Bid)

4 copies of each of the proposed Contract Documents (except Drawings) accompany this Notice of Award. 4 sets of the Drawings will be delivered separately or otherwise made available to you immediately.

You must comply with the following conditions precedent within [15] days of the date you receive this Notice of Award.

1. Deliver to the Engineer 4 fully executed counterparts of the Contract Documents.
2. Deliver with the executed Contract Documents the Contract security [Bonds] as specified in the Instructions to Bidders, Articles 20 and 26 and General Conditions, Articles 2 and 6.
4. You must deliver with the executed Agreement fully executed Certificates of Insurance as specified in the Instructions to Bidders, Articles 20 and 26 and General Conditions, Articles 2 and 6.
3. Other conditions precedent:

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

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Contract Documents.

By: _____
Authorized Signature

Title

cc: Owner

AGREEMENT
BETWEEN OWNER AND CONTRACTOR FOR
CONSTRUCTION CONTRACT

THIS AGREEMENT is by and between:

(Owner) and

(Contractor).

Owner and Contractor, in consideration of the mutual covenants set forth herein, agree as follows:

This Agreement will be effective on _____, 20____ (which is the Effective Date of the Agreement).

ARTICLE 1 – WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

ARTICLE 2 – THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows:

ARTICLE 3 – ENGINEER

3.01 The Project has been designed by The Gateway Engineers, Inc., 100 McMorris Drive, Pittsburgh, PA 15205.

Agreement

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3.02 The Owner has retained The Gateway Engineers, Inc. ("Engineer") to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

A. All time limits for Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Contract Times: Dates*

A. The Work will be substantially completed on or before [REDACTED], and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before [REDACTED].

4.03 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. Substantial Completion: Contractor shall pay Owner \$[REDACTED] for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.
2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner \$[REDACTED] for each day that expires after such time until the Work is completed and ready for final payment.
3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.

ARTICLE 5 – CONTRACT PRICE

A. Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the prices stated in Contractor's Bid, attached hereto as an exhibit (beginning on Page 000110).

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

- A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the _____ day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.
 - 1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract
 - a. 90% of the Work completed, and 90% of materials and equipment not incorporated in the Work but delivered and suitably stored, less in each case the aggregate of payments previously made.
 - b. 95% of all work completed and materials incorporated in the Work after 50% of the Contract Value is completed.

- B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 98 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 100 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

ARTICLE 7 – INTEREST

- 7.01 All moneys not paid when due as provided in Article 15 of the General Conditions shall bear interest at the maximum rate allowed by law at the place of the Project.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

- 8.01 In order to induce Owner to enter into this Contract, Contractor makes the following representations:
- A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.
 - B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 - C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
 - D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Project Specifications, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Project Specifications, especially with respect to Technical Data in such reports and drawings.
 - E. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (3) Contractor's safety precautions and programs.
 - F. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
 - G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
 - H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
 - I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
 - J. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

- A. The Contract Documents which comprise the entire agreement between OWNER and CONTRACTOR are attached to this Agreement, made a part hereof and consists of the following:
1. This Agreement (pages 000520-1 to _____, inclusive).
 2. Performance bond (pages 000610-1 to 000610-4, inclusive).
 3. Payment bond (pages 000615-1 to 000615-4, inclusive).
 4. Certificate of Insurance (pages 000605-1 to 000605-2, inclusive)
 5. General Conditions (pages 000700-1 to 000700-64, inclusive).
 6. Supplementary Conditions (pages 000800-1 to 000800-6, inclusive).
 7. Specifications as listed in the table of contents of the Project Manual.
 8. Drawings, consisting of plans prepared by The Gateway Engineers, Inc. bearing Drawing No. _____, sheets 1 to _____ inclusive titled _____
 9. Addenda (numbers _____ to _____, inclusive).
 10. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid (pages 000110-1 to _____, inclusive).
 - b. Documentation submitted by Contractor prior to Notice of Award (pages _____ to _____, inclusive).
 - c. Notice of Award (page 000510).
 - d. Prevailing Wage Pre-Determination, (Section 000830), if applicable.
 - e. Notice to Bidders (page 000100).
 - f. Instructions to Bidders (pages 000200-1 to 00200-10, inclusive).
 11. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
 - a. Notice to Proceed (pages 000550-1 to _____, inclusive).
 - b. Work Change Directives.
 - c. Change Order(s).
- B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

- A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 *Severability*

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 *Contractor's Employees*

The CONTRACTOR hereby agrees:

- A. That in the hiring of employees for the performance of work under this Contract, or any subcontract hereunder, neither the CONTRACTOR nor any subcontractor, nor any person acting on their behalf of any subcontractor, shall, by reason of race, creed or color discriminate against any citizen of the Commonwealth of Pennsylvania who is qualified and available to perform the work to which the employment relates.
- B. That neither the CONTRACTOR, nor any subcontractor, nor any person acting on their behalf, shall in any manner discriminate against or intimidate any employee hired for the performance of the work under this Contract on account of race, creed, color, sex, national origin, ancestry or age.
- C. That there may be deducted from the amount payable to the CONTRACTOR under this Contract a penalty of five dollars (\$5.00) for each person for each calendar day during which such person was discriminated against or intimidated, in violation of the provisions of this portion of this Contract or the Pennsylvania Human Relations Act.

10.06 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.06:

1. “corrupt practice” means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;
2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

10.07 *Bonds*

The CONTRACTOR has included herewith Surety Bonds each by a Surety Company authorized to do business in Pennsylvania and each in the amount of one hundred (100%) percent of the Contract Price, said Bonds to be executed on the forms provided as follows:

- A. A Bond guaranteeing the work to be done.
- B. A Bond conditioned for the prompt payment of all materials furnished and labor supplied or performed in the prosecution of the work, whether or not said material or labor enter into and become component parts of the work improvement herein contemplated.

10.08 *Contractor's Certifications*

Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.07:

- A. “corrupt practice” means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
- B. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
- C. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial non-competitive levels; and
- D. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. One counterpart each has been delivered to Owner, Engineer and Contractor.

OWNER:

By: _____

Title: _____

CONTRACTOR:

By: _____

Title: _____

Attest: _____

Title: _____

Address for giving notices:

Attest: _____

Title: _____

Address for giving notices:

License No.:

(where applicable)

Phone No. _____

Fax No. _____

Agreement

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00520-8

NOTICE TO PROCEED

Date
C-

Contractor
Address 1
Address 2
City, State, Zip

CONTRACT FOR:
Project description from Ad

You are notified that the Contract Times under the above contract will commence to run on _____. On or before that date, you are to start performing your obligations under the Contract Documents. In accordance with the Agreement, the date of Substantial Completion is _____, and the date of readiness for final payment is _____.

Before you may start any Work at the Site, the General Conditions provides that you must deliver to the Owner (with copies to Engineer and other identified additional insureds) certificates of insurance which is required to be purchased and maintain in accordance with the Contract Documents.

Also, before you may start any Work at the Site, you must: [add other requirements]

By: _____
Authorized Signature

Title

cc: Owner

ACORD CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

PRODUCER

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERNS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED

INSURERS AFFORDING COVERAGE

NAIC #

INSURER A:

INSURER B:

INSURER C:

INSURER D:

INSURER E:

COVERS

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR ADD'L LTR INSRD	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS
	GENERAL LIABILITY COMMERCIAL GENERAL LIABILITY CLAIMS MADE <input type="checkbox"/> OCCUR				EACH OCCURRENCE \$ DAMAGE TO RENTED PREMISES (Ea occurrence) \$ MED EXP (Any one person) \$ PERSONAL & ADV INJURY \$ GENERAL AGGREGATE \$ PRODUCTS - COMP/OP AGG \$
	GEN'L AGGREGATE LIMIT APPLIES PER: POLICY <input type="checkbox"/> PRO- JECT <input type="checkbox"/> LOC				
	AUTOMOBILE LIABILITY ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS HIRED AUTOS NON-OWNED AUTOS				COMBINED SINGLE LIMIT (Ea accident) \$ BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$
	GARAGE LIABILITY ANY AUTO				AUTO ONLY - EA ACCIDENT \$ OTHER THAN EA ACC \$ AUTO ONLY: AGG \$
	EXCESS/UMBRELLA LIABILITY <input type="checkbox"/> OCCUR <input type="checkbox"/> CLAIMS MADE DEDUCTIBLE RETENTION \$				EACH OCCURRENCE \$ AGGREGATE \$ \$ \$ \$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? If yes, describe under SPECIAL PROVISIONS below				WC STATUTORY LIMITS OTH- ER E.L. EACH ACCIDENT \$ E.L. DISEASE - EA EMPLOYEE \$ E.L. DISEASE - POLICY LIMIT \$
	OTHER				

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS

CERTIFICATE HOLDER

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL ____ DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

PERFORMANCE BOND

CONTRACTOR (*name and address*):

SURETY (*name and address of principal place of business*):

OWNER (*name and address*):

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description (*name and location*):

BOND

Bond Number:

Date (*not earlier than the Effective Date of the Agreement of the Construction Contract*):

Amount:

Modifications to this Bond Form: None See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

(*seal*)

Contractor's Name and Corporate Seal

By: _____

Signature

Print Name

Title

Attest:

Signature

Title

SURETY

(*seal*)

Surety's Name and Corporate Seal

By: _____

Signature (*attach power of attorney*)

Print Name

Title

Attest:

Signature

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

7.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Definitions

14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

14.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

14.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

16. Modifications to this Bond are as follows:

PAYMENT BOND

CONTRACTOR (*name and address*):

SURETY (*name and address of principal place of business*):

OWNER (*name and address*):

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description (*name and location*):

BOND

Bond Number:

Date (*not earlier than the Effective Date of the Agreement of the Construction Contract*):

Amount:

Modifications to this Bond Form: None See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature (*attach power of attorney*)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
 2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
 3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
 4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
 5. The Surety's obligations to a Claimant under this Bond shall arise after the following:
 - 5.1 Claimants who do not have a direct contract with the Contractor,
 - 5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
 6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
- 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2 Pay or arrange for payment of any undisputed amounts.
 - 7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.
8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first

- occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.
16. **Definitions**
- 16.1 **Claim:** A written statement by the Claimant including at a minimum:
1. The name of the Claimant;
 2. The name of the person for whom the labor was done, or materials or equipment furnished;
 3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
 4. A brief description of the labor, materials, or equipment furnished;
 5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
 6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
 7. The total amount of previous payments received by the Claimant; and
 8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.
- 16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
- 16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.
- 16.4 **Owner Default:** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
- 16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.
17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.
18. Modifications to this Bond are as follows:

CONTRACTORS APPLICATION FOR PAYMENT

TO OWNER:	PROJECT:	APPLICATION NO.:
		APPLICATION PERIOD:
		APPLICATION DATE:
FROM CONTRACTOR:	VIA ENGINEER:	PROJECT NUMBERS:
The Gateway Engineers, Inc. 100 McMorris Drive Pittsburgh, PA 15205		Engineer's: Contractor's: Owner's:
CONTRACTOR'S APPLICATION FOR PAYMENT		
See the attached continuation sheet(s)		
1. ORIGINAL CONTRACT PRICE		
2. Net change by Change Orders		
3. CURRENT CONTRACT PRICE (Line 1 ± 2)		
4. TOTAL COMPLETED AND STORED TO DATE (Column F on Progress Estimate)		
5. RETAINAGE:		
a.	10 % of Work Completed (\$ 0)=	\$ 0.00
b.	10 % of Materials Stored (\$ 0)=	\$ 0.00
c.	Total Retainage (Line 5a + Line 5b)	\$ 0.00
6.	AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5c)	\$ 0.00
7.	LESS PREVIOUS PAYMENTS (Line 6 from prior Application)	\$ 0.00
8.	AMOUNT DUE THIS APPLICATION	\$ 0.00
9.	BALANCE TO FINISH CONTRACT (Line 3 - Line 4)	\$ 0.00
AMOUNT CERTIFIED		
\$ 0.00 (Line 8 or other – attach explanation of other amount)		
ENGINEER: By: _____ Date: _____		
CHANGE ORDER SUMMARY		
Number	Additions	Deductions
Prior approved		
Totals		
Net Changes		

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment, and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

Progress Estimate

Contractor's Application

GENERAL CONDITIONS

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. 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, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 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. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document 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, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance

with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.
13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .
15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work*—See Paragraph 13.01 for definition.
18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Engineer*—The individual or entity named as such in the Agreement.
21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.
26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
27. *Notice to Proceed*—A written notice 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.
28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
29. *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.
30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.
33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.
35. *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.
36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
37. *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, and such other lands furnished by Owner which are designated for the use of Contractor.

38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
39. *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.
40. *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.
41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *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 a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *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 but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *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; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 *Terminology*

- A. The words and terms discussed in the following paragraphs 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 Article 10 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 15.03 or 15.04).
- 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. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

- 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. *Bonds:* 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 Contractor's Insurance:* When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner's Insurance:* After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 Copies of Documents

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 Before Starting Construction

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), 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;
 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.

2.04 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 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, 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 and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 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 2.03.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 the component parts of the Work.

2.06 Electronic Transmittals

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, 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.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 *Reference Standards*

A. Standards Specifications, Codes, Laws and Regulations

- 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, 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, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract 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, reference standard, 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 part of the Contract Documents prepared by or for Engineer. 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 part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

- 1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
- 2. *Contractor's Review of Contract Documents:* If, before or 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) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) 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 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

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 part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); 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 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers 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 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; or

2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- 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.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *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 Contract 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 Contract. 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 Contract, whichever date is earlier.

4.02 *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 such date.

4.03 *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.

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 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 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.
- B. 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, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, 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 Times and Contract Price. 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.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
 - C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. 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. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 - 1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 - 2. abnormal weather conditions;
 - 3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
 - 4. acts of war or terrorism.
 - D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.
 - E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
 - F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.
 - G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 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.
- 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 permanent improvements are to be made 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.

5.02 *Use of Site and Other Areas*

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

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, 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 any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) 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 directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent 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 and adjacent areas 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 of 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 structures or land to stresses or pressures that will endanger them.

5.03 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 adjacent to the Site;
 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on 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.

5.04 Differing Subsurface or Physical Conditions

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site 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 5.03 is materially inaccurate; or
 2. is of such a nature as to require a change in the Drawings or Specifications; 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 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site

condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Possible Price and Times Adjustments:*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, 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 fall within any one or more of the categories described in Paragraph 5.04.A;
 - 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 Paragraph 13.03; and,
 - c. 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.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a 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 otherwise; or
 - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 Underground Facilities

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent 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 do not warrant or guarantee 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 information and data regarding existing Underground Facilities at the Site;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
 - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then 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 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.
- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with

reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
 - 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 Paragraph 13.03;
 - c. 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; and
 - d. Contractor gave the notice required in Paragraph 5.05.B.
2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
 2. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on 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 removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such

removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) 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 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.
- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. 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, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.
- H. 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, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. 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 (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph

- 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. 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 failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
 - K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, 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. 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 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond 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 the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then 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 bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, 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.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.

- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).
 4. Foreign voluntary worker compensation (if applicable).
- B. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
 2. claims for damages insured by reasonably available personal injury liability coverage.
 3. 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.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
 - a. Such insurance shall be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Broad form property damage coverage.
 4. Severability of interest.
 5. Underground, explosion, and collapse coverage.
 6. Personal injury coverage.
 7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.

8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
 - D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against 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. The automobile liability policy shall be written on an occurrence basis.
 - E. *Umbrella or excess liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
 - F. *Contractor's pollution liability insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.
 - G. *Additional insureds:* The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; 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 (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
 - H. *Contractor's professional liability insurance:* If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions:* The policies of insurance required by this Paragraph 6.03 shall:
 1. include at least the specific coverages provided in this Article.
 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
 4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or

replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.

5. be appropriate for the Work being performed and provide protection from claims that 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.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, 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.
- B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 *Property Insurance*

- A. *Builder's Risk:* Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable 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 Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
 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; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; 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. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication,

construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).
 5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
 6. extend to cover damage or loss to insured property while in transit.
 7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
 8. allow for the waiver of the insurer's subrogation rights, as set forth below.
 9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
 10. not include a co-insurance clause.
 11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
 12. include performance/hot testing and start-up.
 13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.
- C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- D. *Partial Occupancy or Use by Owner:* If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance:* If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.

- F. *Insurance of Other Property:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, 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 insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the 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 Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, 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 or Contractor as trustee or fiduciary, 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 occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.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, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, 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 builder's risk insurance and any other property insurance applicable to the Work.

6.07 Receipt and Application of Property Insurance Proceeds

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 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.
- 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.

7.02 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, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.03 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, whether or not such items are specifically called for in the Contract Documents.

- B. All materials and equipment incorporated into the Work 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.

7.04 *"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 Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item 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 is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that 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, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, 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;
 - 3) it has a proven record of performance and availability of responsive service; and
 - 4) it is not objectionable to Owner.
 - 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.
- B. *Contractor's Expense:* Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

- D. *Effect of Engineer's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 Substitutes

- A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.
 - 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.
 - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
 - 3. 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:
 - a. shall certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design,
 - 2) be similar in substance to that specified, and
 - 3) be suited to the same use as that specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
 - 2) 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
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from that specified, and
 - 2) available engineering, sales, maintenance, repair, and replacement services.

- d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. 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.
- E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 Concerning Subcontractors, Suppliers, and Others

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.
- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require

Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.

- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. 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 the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. 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.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. 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.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.
- O. 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 money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 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.

7.08 Permits

- A. Unless otherwise provided in the Contract Documents, 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 the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

7.09 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.

7.10 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 or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and

losses, and 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 such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

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

7.12 *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, other work in progress, 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 Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

- 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 7.12.A.2 or 7.12.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 at its expense (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 protection 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 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
- G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 *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.

7.14 *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.

7.15 *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.

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements:*

1. Before submitting a Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated the 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 and equipment 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 of that submittal, and that Contractor approves the 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 set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.
- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.
- 1. *Shop Drawings:*
 - a. Contractor shall submit the number of copies required in the Specifications.
 - 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 7.16.D.
 - 2. *Samples:*
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall 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 7.16.D.
 - 3. 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. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.
- 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 or to safety precautions or programs incident thereto.
3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
4. Engineer's review and approval of a Shop Drawing or Sample 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 7.16.A.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 will document any such approved variation from the requirements of the Contract Documents in a Field Order.
5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.
8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

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.
2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *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 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;
 - 6. the issuance of a notice of acceptability by Engineer;
 - 7. any inspection, test, or approval by others; or
 - 8. any correction of defective Work by Owner.
- D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, 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 7.18.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 7.18.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.

7.19 *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 Laws and Regulations.
- 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, 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, 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 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may

- also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
 - C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. 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.
 - D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, 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.

8.02 Coordination

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. an itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 Legal Relationships

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any)

regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. 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.

- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.
- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.
- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) 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 any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

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

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

9.03 *Furnish Data*

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

- 9.04 *Pay When Due*
- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.
- 9.05 *Lands and Easements; Reports, Tests, and Drawings*
- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
 - B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
 - C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.
- 9.06 *Insurance*
- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.
- 9.07 *Change Orders*
- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.
- 9.08 *Inspections, Tests, and Approvals*
- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.
- 9.09 *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.
- 9.10 *Undisclosed Hazardous Environmental Condition*
- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.
- 9.11 *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 (including obligations under proposed changes in the Work).
- 9.12 *Safety Programs*
- 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.
 - B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER’S STATUS DURING CONSTRUCTION

10.01 *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.

10.02 *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 10.08. 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.

10.03 *Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. 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.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer’s authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. 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, are set forth in Paragraph 7.19.
- C. Engineer’s authority as to Change Orders is set forth in Article 11.
- D. Engineer’s authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

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

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, 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 15.06.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 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

1. *Change Orders:*
 - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
 - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
2. *Work Change Directives:* A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.
3. *Field Orders:* Engineer may authorize minor changes in the Work if the changes 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. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *Owner-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. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *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, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
- B. 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, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
 2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
 3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).
- C. *Contractor's Fee:* When applicable, 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 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 13.01.B.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 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - 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 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 Change of Contract Times

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 Change Proposals

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.
 - 1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
 - 2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
 - 3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
 1. 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;
 2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
 4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *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.

ARTICLE 12 – CLAIMS

12.01 *Claims*

- A. *Claims Process:* The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:
 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of

Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation:*
 - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
 - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.
 - 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval:* If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim:* If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results:* If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 Cost of the Work

- A. *Purposes for Determination of Cost of the Work:* The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
 - 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
 - 2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or

incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

- B. *Costs Included:* Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work 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 13.01.C, 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, and 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 13.01.
 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 6.05), 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 communication 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 that Contractor is required by the Contract Documents to purchase and maintain.

C. *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, expediters, 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 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here 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 Paragraph 13.01.B.

D. *Contractor's Fee:* When the Work as a whole 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, Change Proposal, Claim, set-off, or other 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 11.04.C.

- E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, 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.

13.02 *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:* Contractor agrees that:
 1. 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
 2. 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:* 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.

13.03 *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. Payments to Contractor for Unit Price Work will be based on actual quantities.
- 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. 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 the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price 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;
2. there is no corresponding adjustment with respect to any other item of Work; and
3. Contractor believes that it 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 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 Access to Work

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction 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.

14.02 Tests, Inspections, and Approvals

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.
- 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, obtaining, and paying for all inspections and tests required:
 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 3. by manufacturers of equipment furnished under the Contract Documents;
 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. 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. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages 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. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 Uncovering Work

- A. Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then 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, and provide all necessary labor, material, and equipment.
 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages 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 pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 2. 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, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 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, then 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.

14.07 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, 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, then 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 14.07, 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, 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 incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. 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 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 Progress Payments

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 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 during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *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, a warehouse bond, 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.
- C. *Review of Applications:*
 1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, 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 13.03, 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; 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 money 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 15.01.C.2.
 6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

- e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due:*

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

E. *Reductions in Payment by Owner:*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
 - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. the Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. the Contract Price has been reduced by Change Orders;
 - i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
 - j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. 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;
1. there are other items entitling Owner to a set off against the amount recommended.
2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, 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, if Contractor remedies the reasons for such action. The reduction imposed shall be

binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

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 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

15.03 *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 and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- 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 preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

- F. 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 punch list.

15.04 *Partial Use or Occupancy*

- 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. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be 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 15.03.A through E for that part of the Work.
 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work 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 15.03 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 6.05 regarding builder's risk or other property insurance.

15.05 *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, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *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, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
 - d. a list of all disputes that Contractor believes are unsettled; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) 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, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

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 have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. 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 15.07. 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. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.
- D. *Payment Becomes Due:* Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 Waiver of Claims

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 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 Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 1. correct the defective repairs to the Site or such other adjacent areas;
 2. correct such defective Work;
 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 to 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. 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 repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- 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, 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 are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 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 written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 Owner May Terminate for Cause

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and 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);
 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
 1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, 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 complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.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 the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds 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.

- F. 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, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *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; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) 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 16.03.
- 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 are not intended to preclude Contractor from submitting a Change Proposal 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 17 – FINAL RESOLUTION OF DISPUTES

17.01 Methods and Procedures

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or
 2. agree with the other party to submit the dispute to another dispute resolution process; or
 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

18.01 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, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 Computation of Times

- A. When any period of time is referred to in the Contract 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.

18.03 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. 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.

18.04 Limitation of Damages

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, consultants, or subcontractors, shall be liable to

Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

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

18.07 *Controlling Law*

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

18.08 *Headings*

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

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC® C-700 (2013 Edition). All provisions that are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01 *Defined Terms*

SC-1.01.A Add the following new paragraphs immediately after paragraph 1.01.A:

Where "as shown", "as indicated", "as detailed", or words of similar import are used, it shall be understood that reference is made to the Contract Plans accompanying this document, unless stated otherwise. Where "as directed", "as required", "as permitted", "approved", "acceptance", or other words of similar import are used, it shall be understood that direction, requirement, permission, approval or acceptance of the Engineer in intended unless stated otherwise. As used herein, "provide" shall be understood to mean "provide complete in place", that is, furnish and install.

Where masculine pronouns such as "he", "him", or other words of similar import are used, it shall be understood that they shall include the feminine and neuter equivalents.

SC-1.01A.31 *Project Manual* - Add the following language at the end of Paragraph 1.01.A.31: The Project Manual may also be referred to as the Project Specifications.

SC-1.01.A.45 *Substantial Completion* is further defined by a 1978 Act of the Pennsylvania Legislature where payment in full is required, less 1½ percent retention plus the Engineer's Estimate of the work to be completed.

SC-1.01.A.47 *Supplementary Conditions* -- May mean, in addition to this Section, any special Project Conditions detailed in the various Divisions specifying the work.

I.

SC-1.01 *Defined Terms* -- Add the following terms to Section 1.01.A

II.

49. *Entity* -- Shall include persons, corporations, partnerships, political subdivisions, Municipality, Boroughs and Townships.
50. *Owner's Representative* – May include the Owner, agent or employee of the Owner, the Engineer or the Inspector. This person shall observe the progress of the work for compliance with the requirements of the Contract. The Owner's representative shall make written reports of his/her observations and comments.
51. *Inspector* – An employee of the Engineer assigned to the site for the purpose of observing the progress of the work, verifying measurements of the work completed and inspecting materials delivered to the site for compliance with the specifications.
52. *Engineer's Consultant* – An individual or entity having a contract with the Engineer to furnish services as the Engineer's independent professional consultant for the project.

53. *Project Representative* – Inspector, agent or employee of the Owner or their assistants assigned to the site for the purpose of observing the progress of the work, verifying measurements of the work completed and inspecting materials delivered to the site for compliance with the specifications.
54. *Supplemental Unit Prices* – Where the Bid Form or Proposal provides for requests for Supplemental Unit Prices for items of work, such prices shall be used as a basis of payment for adjustments necessary due to increases to, or deductions from, the extent of work required under a Lump Sum Bid Item. The Owner may reject any such prices which are found to be unreasonable or unbalanced and, hence, require reasonable revisions. The use of said Supplemental Unit Prices shall be limited to work approved by the Engineer in writing.
55. *Architect* – The term Architect used in the Project Manual is to be used interchangeable with the term Engineer.
56. *Work Change Directive* – This document contains a complete description of the change in the work and designates the method to be followed to determine the change in the Contract Sum or the Contract Time.

ARTICLE 2 – PRELIMINARY MATTERS

SC-2.02 Copies of Documents

SC-2.02.A. Amend the first sentence of Paragraph 2.02.A. to read as follows:

Owner shall furnish to Contactor up to three (3) printed or hard copies of the Drawings and Project Manual.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

SC-5.01.C Availability of Lands - Add the following language at the end of Paragraph 5.01.C:

The consent of the property owner shall be in writing and a copy of the agreement shall be submitted to the Owner and Engineer prior to use of said land.

SC-5.03 Subsurface and Physical Conditions

SC 5.03.A Delete Paragraph 5.03.A in its entirety and insert the following:

- A. No reports of explorations or tests of subsurface conditions at or adjacent to the Site, or drawings of physical conditions relating to existing surface or subsurface structures at the Site, are known to Owner, except those noted in the Project Specifications.

SC-5.06 Hazardous Environmental Conditions

SC 5.06.A Delete Paragraph 5.06.A in its entirety and insert the following:

- A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner, except those noted in the Project Specifications.

ARTICLE 6 – BONDS AND INSURANCE

SC-6.02 Insurance—General Provisions

SC-6.02 Add the following paragraph immediately after Paragraph 6.02.B:

1. Contractor may obtain worker's compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the project is located, (b) is certified or authorized as a worker's compensation insurance provider by the appropriate state agency, and (c) has been accepted to provide worker's compensation insurance for similar projects by the state within the last 12 months.

SC-6.03 Contractor's Liability Insurance

SC 6.03 Add the following new paragraph immediately after Paragraph 6.03.J:

- K. The limits of liability for the insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the amounts, or greater where required by Laws and Regulations, listed in Article 26 of the Instruction to Bidders.

SC-6.05 Property Insurance The Owner will not purchase and maintain separate property insurance except as may be stated in the Project Specifications.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

SC-7.02 Labor; Working Hours

SC-7.02.A Add the following language at the end of paragraph 7.02.A:

It is understood that if employees of the Owner shall perform any acts as for the purpose of discharging the responsibility undertaken by the Contractor in this Contract, whether requested to perform such acts by the Contractor or not, such employees of the Owner while performing such acts, shall be considered the agents and servants of the Contractor subject to the exclusive control of the Contractor.

SC-7.02.B Add the following language at the end of paragraph 7.02.B:

Overtime – Should overtime, Saturday, Sunday or holiday work be approved by the Owner, the Contractor shall reimburse the Owner for all costs incurred by the Owner's personnel, the Engineer or his Inspectors for time spent on the Project because of such overtime work.

SC-7.08 Permits

III.

SC-7.08.A Delete paragraph A in its entirety and insert the following:

- A. Unless otherwise stated in the Project Specifications, the Owner shall secure all permits from other regulatory agencies for the construction of the Project. The Contractor shall pay all charges of utility owners for connections for providing temporary service to the site. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

SC-7.09 Taxes

SC-7.09 Add a new paragraph immediately after Paragraph 7.09.A:

- B. If the Owner is exempt from payment of sales and compensating use taxes of the State and of cities and counties thereof on all materials to be incorporated into the Work.
 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 does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.

ARTICLE 8 – OTHER WORK AT THE SITE

SC-8.04 Claims between Contractors

SC-8.04 Add the following new paragraph immediately after paragraph GC-8.03:

- A. Should Contractor cause damage to the work or property of any other contractor at the Site, or should any claim arising out of Contractor's performance of the Work at the Site be made by any other contractor against Contractor, Owner, Engineer, or the construction coordinator, Contractor shall promptly attempt to settle with such other contractor by agreement, or to otherwise resolve the dispute by arbitration or at law.
- IV.
 - B. Contractor shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner, Engineer, the construction coordinator and the officers, directors, partners, employees, agents and other consultants and subcontractors of each and any of them from and against all claims, costs, losses and damages (including, but not limited to, fees and charges of engineers, architects, attorneys, and other professionals and court and arbitration costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any other contractor against Owner, Engineer, Engineer's Consultants, or the construction coordinator to the extent said claim is based on or arises out of Contractor's performance of the Work. Should another contractor cause damage to the Work or property of Contractor or should the performance of work by any other contractor at the Site give rise to any other Claim, Contractor shall not institute any action, legal or equitable, against Owner, Engineer, or the construction coordinator or permit any action against any of them to be maintained and continued in its name or for its benefit in any court or before any arbiter which seeks to impose liability on or to recover damages from Owner, Engineer, or the construction coordinator on account of any such damage or Claim.
- V.
 - C. If Contractor is delayed at any time in performing or furnishing Work by any act or neglect of another contractor, and Owner and Contractor are unable to agree as to the extent of any adjustment in Contract Times attributable thereto, Contractor may make a Claim for an extension of times in accordance with Article 12. An extension of the Contract Times shall be Contractor's exclusive remedy with respect to Owner, Engineer, and construction coordinator for any delay, disruption, interference, or hindrance caused by any other contractor. This paragraph does not prevent recovery from Owner, Engineer, or construction coordinator for activities that are their respective responsibilities.

ARTICLE 10 – ENGINEER’S STATUS DURING CONSTRUCTION

SC-10.03 Project Representative

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.A:

SC-10.03 *Resident Project Representative* – When the Engineer provides the services of an Inspector, his duties, as an employee of the Engineer, shall be to observe the progress of the work and compliance with the requirements of the Contract. The Inspector shall make reports to the Engineer. The Inspector shall not be construed as an Agent of the Engineer in interpreting this Contract Document nor shall he authorize deviations from the requirements of the Contract.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

SC-13.01 Cost of the Work

SC 13.01.B.5.c Delete Paragraph 13.01.B.5.c in its entirety and insert the following in its place:

- c. Construction Equipment and Machinery:
 - 1) Rentals of all construction equipment and machinery, and the parts thereof, 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.
 - 2) Costs for equipment and machinery owned by Contractor will be paid at a rate shown for such equipment in the rate book appropriate for the Project as determined by the Engineer. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs. Costs will include the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, shall cease to accrue when the use thereof is no longer necessary for the changed Work. Equipment or machinery with a value of less than \$1,000 will be considered small tools.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

SC-15.06 Final Payment

SC-15.06.D Add the following paragraph immediately after paragraph 15.06.D:

In the case that the project is partially or fully funded by State or County funds, the time frame in 15.06.D becomes 60 days due to the policies of the governmental agencies in charge of funding.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

SC-17.01 Methods and Procedures

SC-17.01.B Delete Paragraph 17.01.B.1 in its entirety

SC-17.01.C Add the following new paragraph immediately after Paragraph SC-17.01.B.

C. Notwithstanding any applicable statute of limitations, a party giving notice under Paragraph SC-17.01.B shall commence an action on the Claim within one year of giving such notice. Failure to do so shall result in the Claim being time-barred and Engineer's action or denial shall become final and binding.

ARTICLE 18 – MISCELLANEOUS

SC-18 Miscellaneous

SC-18.09 Add the following new paragraph immediately after paragraph 18.08:

18.09 The terms of this Contract Document are not to be construed for the benefit of any person not a party to the Contract.

Prevailing Minimum Wage Determination

Attached is the Prevailing Minimum Wage Determination that applies to this project.

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project Name:	Mt. Lebanon Pool Filtration Replacement Contract
General Description:	This project involves demolition and replacement of the pool filtration system; electrical services; installation of a pool surge tank; installation of liquid chlorine tanks and configuration of chlorine application systems; internal building configuration for placement of equipment including CMU block wall demolition and internal door installation; all necessary plumbing appurtenances for connection of new filter system, surge tank, and equipment to the existing system; and site restoration, complete in place.
Project Locality	Municipality of Mt. Lebanon
Awarding Agency:	Municipality of Mt. Lebanon
Contract Award Date:	1/14/2025
Serial Number:	24-09994
Project Classification:	Building/Heavy/Highway
Determination Date:	11/13/2024
Assigned Field Office:	Pittsburgh
Field Office Phone Number:	(412)565-5300
Toll Free Phone Number:	(877)504-8354
Project County:	Allegheny County

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 24-09994 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Asbestos & Insulation Workers	8/1/2023		\$42.40	\$29.01	\$71.41
Asbestos & Insulation Workers	8/1/2024		\$43.40	\$29.51	\$72.91
Boilermakers	6/1/2016		\$40.90	\$27.61	\$68.51
Bricklayer	12/1/2022		\$36.99	\$24.95	\$61.94
Bricklayer	6/1/2024		\$40.25	\$25.34	\$65.59
Bricklayer	12/1/2024		\$41.00	\$25.59	\$66.59
Carpenters - Piledriver/Welder	1/1/2023		\$40.63	\$21.22	\$61.85
Carpenters - Piledriver/Welder	1/1/2024		\$42.13	\$21.97	\$64.10
Carpenters - Piledriver/Welder	1/1/2025		\$43.38	\$22.72	\$66.10
Carpenters - Piledriver/Welder	1/1/2026		\$44.63	\$23.47	\$68.10
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2023		\$39.69	\$19.93	\$59.62
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2024		\$41.49	\$19.93	\$61.42
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2025		\$43.34	\$19.93	\$63.27
Cement Masons	6/1/2023		\$33.07	\$23.59	\$56.66
Cement Masons	7/1/2024		\$34.57	\$25.09	\$59.66
Drywall Finisher	6/1/2023		\$32.39	\$23.75	\$56.14
Drywall Finisher	6/1/2024		\$34.01	\$24.88	\$58.89
Electricians & Telecommunications Installation Technician	12/22/2023		\$48.61	\$31.80	\$80.41
Electricians & Telecommunications Installation Technician	12/27/2024		\$51.76	\$31.80	\$83.56
Electricians & Telecommunications Installation Technician	12/26/2025		\$55.06	\$31.80	\$86.86
Elevator Constructor	1/1/2023		\$56.14	\$42.83	\$98.97
Elevator Constructor	1/1/2024		\$58.55	\$43.87	\$102.42
Glazier	9/1/2023		\$35.65	\$30.05	\$65.70
Iron Workers	6/1/2023		\$38.89	\$35.02	\$73.91
Iron Workers	6/1/2024		\$39.89	\$36.47	\$76.36
Laborers (Class 01 - See notes)	1/1/2023		\$25.82	\$19.46	\$45.28
Laborers (Class 01 - See notes)	1/1/2024		\$26.82	\$19.46	\$46.28
Laborers (Class 01 - See notes)	1/1/2025		\$27.32	\$19.96	\$47.28
Laborers (Class 01 - See notes)	1/1/2026		\$27.82	\$20.46	\$48.28
Laborers (Class 02 - See notes)	1/1/2023		\$25.97	\$19.46	\$45.43
Laborers (Class 02 - See notes)	1/1/2024		\$26.97	\$19.46	\$46.43
Laborers (Class 02 - See notes)	1/1/2025		\$27.47	\$19.96	\$47.43
Laborers (Class 02 - See notes)	1/1/2026		\$27.97	\$20.46	\$48.43
Laborers (Class 03 - See notes)	1/1/2023		\$28.97	\$19.46	\$48.43
Laborers (Class 03 - See notes)	1/1/2024		\$29.97	\$19.46	\$49.43
Laborers (Class 03 - See notes)	1/1/2025		\$30.47	\$19.96	\$50.43
Laborers (Class 03 - See notes)	1/1/2026		\$30.97	\$20.46	\$51.43
Laborers (Class 04 - See notes)	1/1/2021		\$23.57	\$19.32	\$42.89
Landscape Laborer (Skilled)	1/1/2023		\$23.79	\$18.28	\$42.07
Landscape Laborer (Skilled)	1/1/2024		\$24.79	\$18.53	\$43.32

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 24-09994 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Landscape Laborer (Skilled)	1/1/2025		\$25.79	\$18.78	\$44.57
Landscape Laborer (Skilled)	1/1/2026		\$26.79	\$19.03	\$45.82
Landscape Laborer (Tractor Operator)	1/1/2023		\$24.09	\$18.28	\$42.37
Landscape Laborer (Tractor Operator)	1/1/2024		\$25.09	\$18.53	\$43.62
Landscape Laborer (Tractor Operator)	1/1/2025		\$26.09	\$18.78	\$44.87
Landscape Laborer (Tractor Operator)	1/1/2026		\$27.09	\$19.03	\$46.12
Landscape Laborer	1/1/2023		\$23.37	\$18.28	\$41.65
Landscape Laborer	1/1/2024		\$24.37	\$18.53	\$42.90
Landscape Laborer	1/1/2025		\$25.37	\$18.78	\$44.15
Landscape Laborer	1/1/2026		\$26.37	\$19.03	\$45.40
Millwright	6/1/2020		\$41.68	\$20.32	\$62.00
Operators (Class 01 - see notes)	6/1/2022		\$38.89	\$23.69	\$62.58
Operators (Class 01 - see notes)	6/1/2023		\$40.69	\$23.89	\$64.58
Operators (Class 01 - see notes)	6/1/2024		\$41.69	\$24.39	\$66.08
Operators (Class 02 -see notes)	6/1/2022		\$32.82	\$23.69	\$56.51
Operators (Class 02 -see notes)	6/1/2023		\$34.62	\$23.89	\$58.51
Operators (Class 02 -see notes)	6/1/2024		\$35.62	\$24.39	\$60.01
Operators (Class 03 - See notes)	6/1/2022		\$30.03	\$23.69	\$53.72
Operators (Class 03 - See notes)	6/1/2023		\$31.83	\$23.89	\$55.72
Operators (Class 03 - See notes)	6/1/2024		\$32.83	\$24.39	\$57.22
Painters Class 6 (see notes)	6/1/2023		\$30.56	\$24.01	\$54.57
Painters Class 6 (see notes)	6/1/2024		\$32.14	\$24.93	\$57.07
Painters Class 6 (see notes)	6/1/2025		\$34.16	\$25.81	\$59.97
Piledrivers	1/1/2023		\$39.13	\$21.22	\$60.35
Piledrivers	1/1/2024		\$40.63	\$21.97	\$62.60
Piledrivers	1/1/2025		\$41.88	\$22.72	\$64.60
Piledrivers	1/1/2026		\$43.13	\$23.47	\$66.60
Plasterers	6/1/2023		\$32.14	\$20.54	\$52.68
Plasterers	6/1/2024		\$33.14	\$21.04	\$54.18
plumber	6/1/2023		\$48.65	\$25.87	\$74.52
plumber	6/1/2024		\$51.75	\$25.87	\$77.62
plumber	6/1/2025		\$54.95	\$25.87	\$80.82
plumber	6/1/2026		\$58.05	\$25.87	\$83.92
plumber	6/1/2027		\$61.15	\$25.87	\$87.02
Pointers, Caulkers, Cleaners	12/1/2022		\$35.47	\$20.88	\$56.35
Pointers, Caulkers, Cleaners	6/1/2024		\$38.59	\$21.36	\$59.95
Pointers, Caulkers, Cleaners	12/1/2024		\$39.69	\$21.61	\$61.30
Roofers	6/1/2023		\$37.00	\$19.92	\$56.92
Roofers	6/2/2024		\$38.00	\$20.67	\$58.67
Sheet Metal Workers	8/1/2023		\$41.00	\$32.94	\$73.94
Sheet Metal Workers	7/1/2024		\$43.00	\$33.96	\$76.96
Sign Makers and Hangars	7/15/2023		\$31.76	\$24.63	\$56.39
Sign Makers and Hangars	7/15/2024		\$32.32	\$25.82	\$58.14
Sprinklerfitters	7/1/2023		\$43.84	\$25.50	\$69.34

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 24-09994 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Sprinklerfitters	1/1/2024		\$43.28	\$26.06	\$69.34
Sprinklerfitters	7/1/2024		\$45.38	\$26.46	\$71.84
Steamfitters	6/1/2023		\$46.10	\$28.37	\$74.47
Steamfitters	6/1/2024		\$48.15	\$29.57	\$77.72
Stone Masons	12/1/2022		\$38.56	\$23.61	\$62.17
Stone Masons	6/1/2024		\$42.35	\$23.97	\$66.32
Stone Masons	12/1/2024		\$43.10	\$24.22	\$67.32
Terrazzo Finisher	12/1/2022		\$36.13	\$18.03	\$54.16
Terrazzo Finisher	6/1/2023		\$39.79	\$18.47	\$58.26
Terrazzo Finisher	12/1/2024		\$41.04	\$18.72	\$59.76
Terrazzo Mechanics	12/1/2022		\$35.49	\$20.32	\$55.81
Terrazzo Mechanics	6/1/2024		\$39.14	\$20.77	\$59.91
Terrazzo Mechanics	12/1/2024		\$40.39	\$21.02	\$61.41
Tile Finisher	12/1/2022		\$28.76	\$17.34	\$46.10
Tile Finisher	6/1/2024		\$31.56	\$17.74	\$49.30
Tile Finisher	12/1/2024		\$32.51	\$17.99	\$50.50
Tile Setter	12/1/2022		\$35.64	\$21.81	\$57.45
Tile Setter	6/1/2024		\$38.46	\$22.19	\$60.65
Tile Setter	12/1/2024		\$39.41	\$22.44	\$61.85
Truckdriver class 1(see notes)	1/1/2023		\$33.18	\$22.21	\$55.39
Truckdriver class 1(see notes)	1/1/2024		\$34.93	\$22.71	\$57.64
Truckdriver class 1(see notes)	1/1/2025		\$36.43	\$23.21	\$59.64
Truckdriver class 1(see notes)	1/1/2026		\$37.93	\$23.71	\$61.64
Truckdriver class 2 (see notes)	1/1/2023		\$33.64	\$22.52	\$56.16
Truckdriver class 2 (see notes)	1/1/2024		\$35.39	\$23.02	\$58.41
Truckdriver class 2 (see notes)	1/1/2025		\$36.89	\$23.52	\$60.41
Truckdriver class 2 (see notes)	1/1/2026		\$38.39	\$24.02	\$62.41
Window Film / Tint Installer	10/1/2019		\$25.00	\$2.63	\$27.63

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 24-09994 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Carpenter	1/1/2023		\$38.60	\$20.59	\$59.19
Carpenter	1/1/2024		\$40.10	\$21.34	\$61.44
Carpenter	1/1/2025		\$41.35	\$22.09	\$63.44
Carpenter	1/1/2026		\$42.60	\$22.84	\$65.44
Carpenter Welder	1/1/2023		\$40.10	\$20.59	\$60.69
Carpenter Welder	1/1/2024		\$41.60	\$21.34	\$62.94
Carpenter Welder	1/1/2025		\$42.85	\$22.09	\$64.94
Carpenter Welder	1/1/2026		\$44.10	\$22.84	\$66.94
Carpenters - Piledriver/Welder	1/1/2023		\$40.63	\$21.22	\$61.85
Carpenters - Piledriver/Welder	1/1/2024		\$42.13	\$21.97	\$64.10
Carpenters - Piledriver/Welder	1/1/2025		\$43.38	\$22.72	\$66.10
Carpenters - Piledriver/Welder	1/1/2026		\$44.63	\$23.47	\$68.10
Cement Finishers	1/1/2023		\$34.14	\$25.05	\$59.19
Cement Finishers	1/1/2024		\$35.14	\$26.30	\$61.44
Cement Finishers	1/1/2025		\$35.94	\$27.50	\$63.44
Cement Masons	1/1/2020		\$32.84	\$21.10	\$53.94
Electric Lineman	5/29/2023		\$52.56	\$29.99	\$82.55
Electric Lineman	6/3/2024		\$53.97	\$31.05	\$85.02
Electricians & Telecommunications Installation Technician	12/22/2023		\$48.61	\$31.80	\$80.41
Electricians & Telecommunications Installation Technician	12/27/2024		\$51.76	\$31.80	\$83.56
Electricians & Telecommunications Installation Technician	12/26/2025		\$55.06	\$31.80	\$86.86
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	6/1/2023		\$38.89	\$35.02	\$73.91
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	6/1/2024		\$39.89	\$36.47	\$76.36
Laborers (Class 01 - See notes)	1/1/2023		\$29.95	\$25.50	\$55.45
Laborers (Class 01 - See notes)	1/1/2024		\$32.20	\$25.50	\$57.70
Laborers (Class 01 - See notes)	1/1/2025		\$33.70	\$26.00	\$59.70
Laborers (Class 01 - See notes)	1/1/2026		\$34.70	\$27.00	\$61.70
Laborers (Class 02 - See notes)	1/1/2023		\$30.11	\$25.50	\$55.61
Laborers (Class 02 - See notes)	1/1/2024		\$32.36	\$25.50	\$57.86
Laborers (Class 02 - See notes)	1/1/2025		\$33.86	\$26.00	\$59.86
Laborers (Class 02 - See notes)	1/1/2026		\$34.86	\$27.00	\$61.86
Laborers (Class 03 - See notes)	1/1/2023		\$30.50	\$25.50	\$56.00
Laborers (Class 03 - See notes)	1/1/2024		\$32.75	\$25.50	\$58.25
Laborers (Class 03 - See notes)	1/1/2025		\$34.25	\$26.00	\$60.25
Laborers (Class 03 - See notes)	1/1/2026		\$35.25	\$27.00	\$62.25
Laborers (Class 04 - See notes)	1/1/2023		\$30.95	\$25.50	\$56.45
Laborers (Class 04 - See notes)	1/1/2024		\$33.20	\$25.50	\$58.70
Laborers (Class 04 - See notes)	1/1/2025		\$34.70	\$26.00	\$60.70
Laborers (Class 04 - See notes)	1/1/2026		\$35.70	\$27.00	\$62.70
Laborers (Class 05 - See notes)	1/1/2023		\$31.36	\$25.50	\$56.86
Laborers (Class 05 - See notes)	1/1/2024		\$33.61	\$25.50	\$59.11

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 24-09994 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Laborers (Class 05 - See notes)	1/1/2025		\$35.11	\$26.00	\$61.11
Laborers (Class 05 - See notes)	1/1/2026		\$36.11	\$27.00	\$63.11
Laborers (Class 06 - See notes)	1/1/2023		\$28.20	\$25.50	\$53.70
Laborers (Class 06 - See notes)	1/1/2024		\$30.45	\$25.50	\$55.95
Laborers (Class 06 - See notes)	1/1/2025		\$31.95	\$26.00	\$57.95
Laborers (Class 06 - See notes)	1/1/2026		\$32.95	\$27.00	\$59.95
Laborers (Class 07 - See notes)	1/1/2023		\$30.95	\$25.50	\$56.45
Laborers (Class 07 - See notes)	1/1/2024		\$33.20	\$25.50	\$58.70
Laborers (Class 07 - See notes)	1/1/2025		\$34.70	\$26.00	\$60.70
Laborers (Class 07 - See notes)	1/1/2026		\$35.70	\$27.00	\$62.70
Laborers (Class 08 - See notes)	1/1/2023		\$32.45	\$25.50	\$57.95
Laborers (Class 08 - See notes)	1/1/2024		\$34.70	\$25.50	\$60.20
Laborers (Class 08 - See notes)	1/1/2025		\$36.20	\$26.00	\$62.20
Laborers (Class 08 - See notes)	1/1/2026		\$37.20	\$27.00	\$64.20
Millwright	6/1/2023		\$45.50	\$23.72	\$69.22
Millwright	6/1/2024		\$47.59	\$23.72	\$71.31
Millwright	6/1/2025		\$49.72	\$23.72	\$73.44
Operators (Class 01 - see notes)	1/1/2023		\$36.79	\$23.58	\$60.37
Operators (Class 01 - see notes)	1/1/2024		\$38.59	\$24.03	\$62.62
Operators (Class 01 - see notes)	1/1/2025		\$40.39	\$24.23	\$64.62
Operators (Class 02 -see notes)	1/1/2023		\$36.53	\$23.58	\$60.11
Operators (Class 02 -see notes)	1/1/2024		\$38.33	\$24.03	\$62.36
Operators (Class 02 -see notes)	1/1/2025		\$40.13	\$24.23	\$64.36
Operators (Class 03 - See notes)	1/1/2023		\$32.88	\$23.58	\$56.46
Operators (Class 03 - See notes)	1/1/2024		\$34.68	\$24.03	\$58.71
Operators (Class 03 - See notes)	1/1/2025		\$36.48	\$24.23	\$60.71
Operators (Class 04 - See notes)	1/1/2023		\$32.42	\$23.58	\$56.00
Operators (Class 04 - See notes)	1/1/2024		\$34.22	\$24.03	\$58.25
Operators (Class 04 - See notes)	1/1/2025		\$36.02	\$24.23	\$60.25
Operators (Class 05 - See notes)	1/1/2023		\$32.17	\$23.58	\$55.75
Operators (Class 05 - See notes)	1/1/2024		\$33.97	\$24.03	\$58.00
Operators (Class 05 - See notes)	1/1/2025		\$35.77	\$24.23	\$60.00
Operators Class 1-A	1/1/2023		\$39.79	\$23.58	\$63.37
Operators Class 1-A	1/1/2024		\$41.59	\$24.03	\$65.62
Operators Class 1-A	1/1/2025		\$43.39	\$24.23	\$67.62
Operators Class 1-B	1/1/2023		\$38.79	\$23.58	\$62.37
Operators Class 1-B	1/1/2024		\$40.59	\$24.03	\$64.62
Operators Class 1-B	1/1/2025		\$42.39	\$24.23	\$66.62
Painters Class 1 (see notes)	6/1/2022		\$34.45	\$22.82	\$57.27
Painters Class 2 (see notes)	6/1/2023		\$36.01	\$24.01	\$60.02
Painters Class 2 (see notes)	6/1/2024		\$38.09	\$24.93	\$63.02
Painters Class 2 (see notes)	6/1/2025		\$40.36	\$25.81	\$66.17
Painters Class 3 (see notes)	6/1/2023		\$38.33	\$24.01	\$62.34
Painters Class 3 (see notes)	6/1/2024		\$40.66	\$24.93	\$65.59

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 24-09994 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Painters Class 3 (see notes)	6/1/2025		\$43.69	\$25.81	\$69.50
Painters Class 4 (see notes)	6/1/2019		\$28.20	\$20.06	\$48.26
Painters Class 5 (see notes)	6/1/2019		\$22.91	\$20.06	\$42.97
Pile Driver Divers (Building, Heavy, Highway)	1/1/2023		\$58.70	\$21.22	\$79.92
Pile Driver Divers (Building, Heavy, Highway)	1/1/2024		\$60.95	\$21.97	\$82.92
Pile Driver Divers (Building, Heavy, Highway)	1/1/2025		\$62.82	\$22.72	\$85.54
Pile Driver Divers (Building, Heavy, Highway)	1/1/2026		\$64.70	\$23.47	\$88.17
Piledrivers	1/1/2023		\$39.13	\$21.22	\$60.35
Piledrivers	1/1/2024		\$40.63	\$21.97	\$62.60
Piledrivers	1/1/2025		\$41.88	\$22.72	\$64.60
Piledrivers	1/1/2026		\$43.13	\$23.47	\$66.60
Steamfitters (Heavy and Highway - Gas Distribution)	5/1/2022		\$48.43	\$40.28	\$88.71
Truckdriver class 1(see notes)	1/1/2023		\$33.18	\$22.21	\$55.39
Truckdriver class 1(see notes)	1/1/2024		\$34.93	\$22.71	\$57.64
Truckdriver class 1(see notes)	1/1/2025		\$36.43	\$23.21	\$59.64
Truckdriver class 1(see notes)	1/1/2026		\$37.93	\$23.71	\$61.64
Truckdriver class 2 (see notes)	1/1/2023		\$33.64	\$22.52	\$56.16
Truckdriver class 2 (see notes)	1/1/2024		\$35.39	\$23.02	\$58.41
Truckdriver class 2 (see notes)	1/1/2025		\$36.89	\$23.52	\$60.41
Truckdriver class 2 (see notes)	1/1/2026		\$38.39	\$24.02	\$62.41

Work Change Directive

No. _____

Date of Issuance:	Effective Date:
Owner:	Owner's Contract No.:
Contractor:	Contractor's Project No.:
Engineer:	Engineer's Project No.:
Project:	Contract Name:

Contractor is directed to proceed promptly with the following change(s):

Description:

Attachments: [List documents supporting change]

Purpose for Work Change Directive:

Directive to proceed promptly with the Work described herein, prior to agreeing to changes on Contract Price and Contract Time, is issued due to: [check one or both of the following]

- Non-agreement on pricing of proposed change.
- Necessity to proceed for schedule or other Project reasons.

Estimated Change in Contract Price and Contract Times (non-binding, preliminary):

Contract Price	\$	[increase] [decrease].
Contract Time	days	[increase] [decrease].

Basis of estimated change in Contract Price:

- | | |
|---|-------------------------------------|
| <input type="checkbox"/> Lump Sum | <input type="checkbox"/> Unit Price |
| <input type="checkbox"/> Cost of the Work | <input type="checkbox"/> Other |

RECOMMENDED:

AUTHORIZED BY:

RECEIVED:

By:

By:

By:

Engineer (Authorized Signature)

Owner (Authorized Signature)

Contractor (Authorized Signature)

Title:

Title:

Title:

Date:

Date:

Date:

Approved by Funding Agency (if applicable)

By:

Date:

Title:

Change Order No. _____

Date of Issuance:
Owner:
Contractor:
Engineer:
Project:

Effective Date:
Owner's Contract No.:
Contractor's Project No.:
Engineer's Project No.:
Contract Name:

The Contract is modified as follows upon execution of this Change Order:

Description:

Attachments: [List documents supporting change]

CHANGE IN CONTRACT PRICE	CHANGE IN CONTRACT TIMES <i>[note changes in Milestones if applicable]</i>
Original Contract Price: \$ _____	Original Contract Times: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] from previously approved Change Orders No. ___ to No. ___: \$ _____	[Increase] [Decrease] from previously approved Change Orders No. ___ to No. ___: Substantial Completion: _____ Ready for Final Payment: _____ days
Contract Price prior to this Change Order: \$ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] of this Change Order: \$ _____	[Increase] [Decrease] of this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
Contract Price incorporating this Change Order: \$ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for Final Payment: _____ days or dates

RECOMMENDED:	ACCEPTED:	ACCEPTED:
By: _____ Title: _____ Date: _____	By: _____ Title: _____ Date: _____	By: _____ Title: _____ Date: _____

Approved by Funding Agency (if applicable)

By: _____ Date: _____
Title: _____

Field Order

No. _____

Date of Issuance: _____ Effective Date: _____
Owner: _____ Owner's Contract No.: _____
Contractor: _____ Contractor's Project No.: _____
Engineer: _____ Engineer's Project No.: _____
Project: _____ Contract Name: _____

Contractor is hereby directed to promptly execute this Field Order, issued in accordance with General Conditions Paragraph 11.01, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference: _____ Specification(s) _____ Drawing(s) / Detail(s) _____

Description: _____

Attachments: _____

ISSUED:

RECEIVED:

By: _____ By: _____
Engineer (Authorized Signature) Contractor (Authorized Signature)

Title: _____ Title: _____

Date: _____ Date: _____

Copy to: Owner

SECTION 01100 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

1. Work covered by the Contract Documents.
2. Type of the Contract.
3. Use of premises.
4. Owner's occupancy requirements.
5. Work restrictions.
6. Specification formats and conventions.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Mt. Lebanon Pool Filtration Replacement
1. Project Location: Mt. Lebanon Pool, Municipality of Mt. Lebanon, PA
- B. Owner: Mt. Lebanon Recreation Center, 900 Cedar Boulevard, 2nd floor, Pittsburgh, PA 15228
1. Owner's Representative: David Donnellan, Recreation Director
- C. Engineer: The Gateway Engineers, Inc., 100 McMorris Road, Pittsburgh, PA 15205
1. Dennis J. Flynn, P.E. – Project Manager

D. The Work consists of the following:

This project involves demolition and replacement of the pool filtration system; electrical services; installation of a pool surge tank; installation of liquid chlorine tanks and configuration of chlorine application systems; internal building configuration for placement of equipment including CMU block wall demolition and internal door installation; all necessary plumbing appurtenances for connection of new filter system, surge tank, and equipment to the existing system; and site restoration, complete in place.

1.4 TYPE OF CONTRACT

- A. Project will be constructed under a single prime Lump Sum contract.

1.5 USE OF PREMISES

- A. General: Contractor shall have use of premises for construction operations as indicated by the Borough.
- B. Use of Site: Limit use of premises to areas indicated by the Municipality. Do not disturb portions of project site beyond areas in which the Work is indicated.

1.6 WORK RESTRICTIONS

- A. On-Site Work Hours: Work shall be generally performed during normal business working hours of 7:00 a.m. to 7:00 p.m., Monday through Saturday, except otherwise indicated.
- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
1. Notify Owner not less than two (2) days in advance of proposed utility interruptions.
 2. Do not proceed with utility interruptions without Owner's written permission.

1.7 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "MasterFormat" numbering system.
1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
 2. Division 1: Sections in Division 1 govern the execution of the Work of all Sections in the Specifications.

B. 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. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
 - a. 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01100

SECTION 01110 – GENERAL PROJECT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

1. General Project Requirements
2. Examination of Contract Documents and Site(s)
3. Pre-Construction Conference
4. Photographic Documentation
5. Notification Requirements
6. Federal, State and Local Requirements
7. Prevailing Wage Requirements
8. Inspection Services
9. Suspension of Work due to Non-Conformance with Specifications
10. Description of Work to be Completed
11. Liquidated Damages

1.3 GENERAL PROJECT REQUIREMENTS

- A. The Bidder shall become familiar with the site of the work and submit his bid based on this specification and his personal knowledge of construction techniques. No additional compensation will be allowed except as may be warranted by a duly executed Change Order.
- B. The Work to be performed under this Contract shall consist of providing all labor, materials, and equipment that is necessary and required to complete the project in accordance with the Contract Documents.
- C. In order to maintain the project schedule, the Contractor shall be required to tent or otherwise protect, the Project Site from adverse weather (rain, wind, storms, frost, snow or heat) if necessary. No time extension shall be approved for delays caused by weather. The cost of weather protection shall be included within the Lump Sum Bid.
- D. After award of the Contract, the Contractor shall provide a Schedule of Values for the Lump Sum Bid. The Schedule of Values shall itemize the listed items for the Lump Sum Bid and any other Items for use in determining allocations for payments for the Contractor's Applications for Payment. The Schedule of Values shall be submitted and approved prior to beginning any work. The Contractor shall provide a unit price for the listed items in the Bid Form and Proposal.

- E. All Contractors and sub-Contractors shall become familiar with the contents of this total Contract Document and the responsibilities of other Contractors, utility companies and the Owner.
- F. The Contractor shall at all times conduct his operations in a neat and workmanlike manner and at the end of each day's work shall remove from the premises all debris and rubbish resulting from his operations. The Contractor must secure the site at the end of every day.
- G. The Contractor shall be fully responsible for all materials and equipment delivered to, or stored, or left at, the job site during the progress of the work. The Contractor shall be responsible for the restoration, at no additional compensation, of the area used to store the equipment and/or supplies.
- H. The Contractor shall begin work on the date listed on the Notice to Proceed and shall be fully responsible for the unfinished work as it progresses until completion and final acceptance thereof.
- I. No charges or claim for additional compensation shall be made by the Contractor for any delays or hindrance, regardless of duration or extent, caused by the failure of the Owners of structures on, under and/or over the project to adjust their facilities during the progress of any portion of the work embraced in the Contract, but the Contractor will be granted an extension of time for the completion of the work.
- J. The Contractor's attention is called to the fact that disposal of excess material must be at an approved site outside of the Municipality. The disposal of all excess material must be in accordance with requirements of the jurisdiction in which the disposal site is located.
- K. Any work that may reasonably be inferred or is specifically indicated or called for from the Specifications or Drawings as being required to produce the intended result shall be supplied whether or not it is specifically called for in the Specifications. Such items of work shall be included in the Lump Sum Base Bid.
- L. The Drawings show existing conditions in a general way. It shall be the responsibility of the Contractor to verify all distances and locations in the field.
- M. Adequate protection shall be provided for all lawns, shrubs, trees, buildings and/or structures in the limits of work. The Contractor shall remove, preserve and replace all shrubs in the limits of work. The Contractor is responsible to replace all of the damaged items at no cost to the Owner.
- N. The Contractor shall provide all necessary safeguards including the installation of shoring, structural supports, protective fencing and barriers, etc., as may be required to prevent damage to adjacent property or injury to persons. All work shall be performed in accordance with the requirements of the local building codes and the rules, regulations, and ordinances of all other governing bodies having jurisdiction. The Contractor will be held responsible for any claim arising from his failure to provide proper safeguards, or for his failure to conduct his operation in a manner consistent with the rules, regulations and ordinances of these governing bodies having jurisdiction.

- O. The Contractor is responsible to protect all utilities located in the limits of work including utility poles, gas, water and sewer lines. There will be no additional compensation to shore any utility poles or repair damaged utilities if necessary.
- P. The Owner may, at any time, by a written order and without notice to the Surety, require the performance of such extra work and/or changes as he may find necessary or desirable. The amount of compensation to be paid to the Contractor for any extra and/or changed work as so ordered shall be determined by the schedule of values.
- Q. The Contractor agrees that he will, at his own expense, repair and/or replace all such defective work and all other damages thereby, which become defective during the term of the Guaranty-Warranty. Any utility or service lines that are damaged shall be repaired at the Contractor's expense.
- R. The Owner reserves the right to reject any or all bids, to waive any informality in bids received, to accept or reject any or all items of any bid. The right is also reserved to reject any or all unbalanced bids.
- S. No verbal or oral interpretation will be made to any bidder as to the meaning of Contract documents or any part thereof. Every request for such an interpretation shall be made in writing to the Owner and Engineer. Any inquiry received seven (7) or more days prior to the bid opening day will be given consideration. Every interpretation made to a Bidder will be in the form of an Addendum to the Contract documents, and when issued, will be on file in the office of the Owner and Engineer at least five (5) days before bids are opened.

In addition, all addenda will be emailed to each person holding the Contract documents, and a signed return copy shall be required with each submitted bid and shall become a part of the Contract. Receipt of all Addenda shall be acknowledged by each bidder prior to submittal.

- T. The Contractor shall keep the Contract work his control and see that the work is properly supervised and carried on faithfully and efficiently. The Contractor shall supervise the work personally or shall have a competent foreman or superintendent on site at all times, who shall be on the project at all times, even during work by the Sub-Contractors, to receive orders and directions from the Engineer. The Foreman or superintendent shall be clothed with full authority by the Contractor to execute such orders without delay and make arrangements for all necessary labor and materials.

The Contractor enters into this Contract with the understanding that he is solely responsible for methods of construction he uses, safety precautions and the protection of the work. He shall also be solely responsible to insure the protection from injury and death of his employees, the Owner and the Owner's employees, the Engineer and the Engineer's employees and the general public. It is not the responsibility of the Owner, the Engineer or the Owner's Inspector to insure the methods, precautions, quality of work and responsibilities of the Contractor are carried out, but they are solely the responsibility of the Contractor.

- U. The Engineer shall be the Owners representative during construction and shall approve or reject the work contemplated under this Contract. The Engineer shall determine the amount, quality, acceptability and fitness of several kinds of work and materials which are to be paid for under this Contract. The Engineer's estimates and decisions shall be final and conclusive, except as herein otherwise expressly provided. In case any questions shall arise between the parties hereto, relative to said Contract or specification, the determination or decision of the Engineer shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this Contract, affected in any manner or to any extent, by such questions.

The Engineer shall decide the meaning and intent of any portion of the Specifications and of any Plans or Drawings where the same may be found obscure or in dispute. Any differences or conflicts in regard to their work which may arise between the Contractor under this Contract and other Contractors performing work for the Owner shall be adjusted and determined by the Engineer.

- V. Neither the Engineer's authority to act under these Specifications nor any decision made by him in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of the Engineer to the Contractor and Sub-Contractor, any of their agents or employees or any other person. The Engineer will not be responsible for the construction means, methods, techniques, sequences or procedure or the safety precautions and programs incident thereto, and he will not be responsible for the Contractor's failure to perform the work in accordance with the Contract documents. The Engineer will not be responsible for the acts or omissions of the Contractor, or any Sub-Contractor, or any of the Contractor or Sub-Contractor's agents or employees or any other persons performing any of the work.
- W. Whenever a required material or article is specified or shown on the Plans by using the name of a proprietary product or of a particular manufacturer or vendor, any material or article which will perform adequately the duty imposed by the general design will be considered equal and satisfactory, providing the material or article so proposed is of equal substance and function in the sole opinion of the Engineer. Such substitutions shall not be purchased or installed without the written approval of the Engineer. In addition, such substitution shall be made at no additional cost to the Owner.
- X. Prior to the acceptance of the project, a final inspection shall be made by the Engineer and a representative of the Municipality.
- Y. The Contractor shall be responsible for the entire project in accordance with the Contract, including the terms and conditions of the agreement, the Specifications, the special provisions and the Drawings thereof, from the date of commencement of the work until the expiration of the maintenance bond, being two years from the date of final acceptance issued by the Owner. It being distinctly understood, in this connection, that the issuance of a final estimate does not and shall not relieve the Contractor and surety from the continuing liability for removal, renewals and restorations made necessary by latent defects in any part of the work, including materials and workmanship.

- Z. Each bidder shall acquaint himself, by personal examination of the location of the proposed work and shall inform himself of the actual conditions and requirements of the work, including risks, means of access, character of the soil and subsoil, restrictions and regulations. Failure to do so will not relieve a successful bidder of his obligations to furnish all material and labor necessary to carry out the provisions of the Contract documents and to complete the contemplated work for the consideration set forth in his bid. The submission of a bid shall constitute and imply full knowledge of such conditions and regulations and acceptance of risks therein contained.
- AA. All bidding Contractors must intend to perform or prosecute with his own personnel and equipment at least fifty (50%) percent of the work based on the total Bid Price to be considered as a responsible Bidder. Failure to comply with this requirement at any time during persecution of the Work may be considered as grounds for termination by the Owner.
- BB. Article 6 – Payment Procedures on Page 000520-3 of the Agreement (Paragraph 6.02A.1.a) is deleted in its entirety and replaced as follows:
- 90% of the Work completed, less in each case the aggregate of payments previously made.
- CC. Article 6 – Payment Procedures on Page 000520-3 of the Agreement (Paragraph 6.02A.1.b) is deleted in its entirety and replaced as follows:
- 95% of all work completed after 50% of the Contract Value is completed, less in each case the aggregate of payments previously made.
- DD. The Contractor shall be fully responsible for the startup of the pool including any and all coordination with the Allegheny County Health Department (ACHD). If, after the ACHD performs their inspection, there are any deficiencies; the Contractor shall take necessary steps to correct any deficiencies at no additional cost to the owner.

1.4 PRECONSTRUCTION CONFERENCE

- A. Conduct conference at Owner's office to review methods and procedures related to Work to be completed including, but not limited to, the following:
1. Review construction methods and existing site conditions.
 2. Required submittals during the course of the project.
 3. Submittal of emergency telephone numbers for all parties involved with the Work to be completed.
 4. Review and finalize work schedule and verify availability of personnel, equipment, and facilities needed to make progress and avoid delays.
 5. Review payment procedures.
 6. Review Resident Notification Requirements.
 7. Review Work Suspension Procedures.
- B. Review and finalize protection requirements and traffic control procedures.

1.5 PHOTOGRAPHIC DOCUMENTATION

- A. Photographs and/or video in sufficient detail of existing conditions of trees, Plantings, adjoining construction, and site improvements that might be misconstrued as damaged by the Work are required. Work will not be permitted to begin until such documentation is submitted, reviewed and approved in writing by the Engineer. Payment for this requirement shall be incidental to the Lump Sum bid.

1.6 NOTIFICATION REQUIREMENTS

- A. The Contractor shall make all necessary arrangements with property owners and the Municipality in regard to his operations, on, over, or adjacent to roads, streets, or other property.

1.7 FEDERAL, STATE AND LOCAL REQUIREMENTS

- A. The Contractor shall comply with applicable Federal, State and Local laws, provisions and policies governing health, safety and general welfare of the public and employees working on the project. The Contractor shall comply with the Federal Construction Safety Act (P.L. 91-54), Federal Register, Chapter XVII, Part 1926 of Title 29 Code of Federal Regulations, Occupational Safety and Health Regulations for Construction, and subsequent publications updating these regulations.
- B. The Contractor shall act as, or designate a competent person to act as, the representative at the site who is familiar with the OSHA regulations for enforcement and for taking immediate corrective action if advised of any noncompliance. Nothing in this Contract shall obligate The Gateway Engineers, Inc. to be responsible to the Municipality or to third parties to inspect job sites within the Municipality to ensure compliance with Occupational Safety Health Administration (OSHA) standards.
- C. The Contractor shall notify Pennsylvania One Call System, Inc. at 1-800-242-1776 prior to any construction on site. The Contractor shall verify the depth of any utility lines well in advance of any construction in order to adjust the new line in case of any conflict. No additional compensation shall be given for realigning or relaying utilities or storm sewers due to conflicts of the existing utilities during construction.
- D. The Contractor is required to fully inform himself/herself concerning location of all public or private structures on, under and/or over the project that may interfere with his/her operations. The Contractor is required to fully inform himself/herself concerning the location of all public or private structures that may or may not require removal, resetting or reconstruction. The Contractor shall assume that he/she has prepared his/her bid and entered into the Contract in full contemplation of the conditions to be encountered and his/her responsibility in connection therewith. The Engineer has brought such structures to his/her attention, but such indications shall not be assumed to relieve the Contractor of his/her responsibility with respect thereto. Neither shall the Engineer or the Owner be held responsible for any omission or failure to give notice to the Contractor of any other structures on, under and/or over the project.

E. All traffic control must be implemented according to PennDOT Publication 213. The Contractor must coordinate all construction activities with PennDOT, the Municipal Police Department, and the Engineer as applicable. If project activities are shutdown or suspended by PennDOT, the Municipal Police Department or the Engineer due to non-compliance, no additional compensation will be considered by the Owner in order for the Contractor to take corrective measures and resume Work.

F. The Contractor's attention is called to the fact that they may go across gas, cable television and water lines, so, before starting any work, all utility companies must be notified so their service lines can be located. The Contractor shall notify Pennsylvania One Call System, Inc. at 1-800-242-1776 prior to any construction on site as required by Pennsylvania Act #172. The Contractor shall verify the depth of these lines well in advance of any construction in order to adjust the new line in case of any conflict.

Also, overhead electric lines and guy wires may exist within the limits of work and the Contractor's attention is called to this fact. The Contractor shall be responsible for coordinating his activities with the utility companies and arrange for the replacement, and/or support of poles and/or lines. The costs associated with this shall be incidental to the Base Bid.

G. Any public utility or service lines that are damaged shall be repaired at the Contractor's expense.

H. Nondiscrimination/Sexual Harassment Clause

During the term of the Contract, the Contractor agrees as follows:

1. In the hiring of any employee(s) for the manufacture of supplies, performance of work, or any other activity required under the grant agreement or any subgrant agreement, Contract, or subcontract, the Grantee, a subgrantee, a Contractor, a subcontractor, or any person acting on behalf of the Grantee shall not, by reason of gender, race, creed, or color, discriminate against any citizen of this Commonwealth who is qualified and available to perform the work to which the employment relates.
2. The Grantee, any subgrantee, Contractor or any subcontractor or any person on their behalf shall not in any manner discriminate against or intimidate any of its employees on account of gender, race, creed, or color.
3. The Grantee, any subgrantee, Contractor or any subcontractor shall establish and maintain a written sexual harassment policy and shall inform their employees of the policy. The policy must contain a notice that sexual harassment will not be tolerated and employees who practice it will be disciplined.
4. The Grantee, any subgrantee, Contractor or any subcontractor shall not discriminate by reason of gender, race, creed, or color against any subgrantee, Contractor, subcontractor or supplier who is qualified to perform the work to which the Contract relates.
5. The Grantee, any subgrantee, any Contractor or any subcontractor shall, within the time periods requested by the Commonwealth, furnish all necessary employment documents and records and permit access to their books, records, and accounts by the granting agency and the Bureau of Minority and Women Business Opportunities (BMWBO), for the purpose of ascertaining compliance with this Nondiscrimination/Sexual Harassment Clause. Within thirty (30) days after award of any grant, the Grantee shall be required to complete, sign and submit Form STD-21, the "Initial Contract Compliance Data" form. If the Grantee has fewer than five employees, or if all its employees are from the same family, or if it has completed the STD-21 form within the past 12 months, it may, within

- 15 days after award of the grant, request an exemption from the STD-21 form from the granting agency.
6. The Grantee, any subgrantee, Contractor or any subcontractor shall include this Nondiscrimination/Sexual Harassment Clause in every subgrant agreement, Contract or subcontract so that those provisions applicable to subgrantees, Contractors or subcontractors will be binding upon each subgrantee, Contractor or subcontractor.
 7. The Commonwealth may cancel or terminate the grant agreement and all money due or to become due under the grant agreement may be forfeited for a violation of this Nondiscrimination/Sexual Harassment Clause. In addition, the granting agency may proceed with debarment or suspension and may place the Grantee, subgrantee, Contractor, or subcontractor in the Contractor Responsibility File.
 8. The Grantee, any subgrantee, Contractor or any subcontractor shall acknowledge that the design and construction of the proposed facility complies with the Architectural Barriers Act of 1968 and section 504 of the Rehabilitation Act of 1973, PA Act 235 of 1965 as amended; the Universal Accessibility Act and the Americans with Disabilities Act (ADA) of 1990; as amended. All parties involved must follow all guidelines of said Acts to maintain funding requirements. Any deviations must be discussed and evaluated before modifications are made during construction.

1.8 PREVAILING WAGE REQUIREMENTS

- A. Pennsylvania prevailing wages **must** be paid on this Contract.
- B. The Contractor **must** supply the Engineer with weekly certified payrolls.

1.9 INSPECTION SERVICES

- A. Inspection services furnished by the Owner are predicated on an eight hour day, beginning not earlier than 7:00 A.M. and ending not later than 5:00 P.M., prevailing time, for a five (5) day week, Monday through Friday. The Owner shall pay for these inspection services.
- B. The regular hourly rate for an inspector is the Owner's approved per diem rate which is in effect at that time. Should a Contractor elect to work longer than the prescribed eight (8) hour day, he will be charged for overtime inspection services at the rate of time and one half for all time over and above eight (8) hours. Should a Contractor elect to work on a Saturday, he will be charged at the rate of time and one-half for each and every hour of inspection services rendered. The Contractor may not elect to work overtime or on a Saturday without inspection unless authorized by the Engineer or Owner. All such additional costs for any inspection services rendered as stated herein shall be deducted from the periodical or current estimates due the Contractor.

NOTE: On this project the Contractor may work 4-10 hour days without paying for inspection services. All time over 40 hours in any week will be billed to the Contractor.

1.10 SUSPENSION OF WORK DUE TO NON-CONFORMANCE WITH SPECIFICATIONS

- A. During the completion of the work, the Contractor's employees must complete the Contracted work in accordance with the Contract Documents under the supervision of an on-site Foreman.

If during the execution of the Contract, the Owner's Representative determines work is not being completed in accordance with the Specifications, unnecessary damage to adjacent properties is resulting from carelessness or work outside the limits of the Project is taking place he shall administer the following procedure.

- B. The Owner's Representative will first discuss non-compliance with the Contract Specifications, damage, or work beyond the project limits with the Foreman.

If a resolution cannot be achieved through discussion, the Owner's Representative will mark the limit of acceptable work and notify the Foreman that any work beyond the marked scope of work will be at the Contractor's own risk and not a pay item. The Contractor shall be responsible to repair any damage outside the limit of work at his sole expense.

- C. If the demarcation of the limits of acceptable work does not result in a resolution of the matter, the Owner's Representative will notify the Engineer in Charge and/or Owner of the situation and request authorization to shut the project down.
- D. Once the authorization to shut the project down is given by the Engineer in Charge and/or Owner, the Owner's Representative will issue the Foreman a Shut Down Notice. In addition, a copy will be given to the Municipality and a copy forwarded to the Contractors address of record. The Shut Down Notice will be clear as to why the project is being shut down and list the corrections that must be completed in order for the project to proceed.
- E. If the Foreman defies the Shut Down Notice, the police will be sent to the project to shut the job down and remove the Contractor's forces.
- F. This procedure will be reviewed at the pre-construction meeting prior to the start of work. The execution of the Agreement indicates the Contractor's understanding and acceptance of this procedure.

1.11 LIQUIDATED DAMAGES

- A. Bidder agrees that the Work will be substantially complete on or before April 1, 2025, and fully complete, operational and ready for final payment in accordance with Paragraph 15 of the General Conditions on or before April 30, 2025 or liquidated damages in the amount of five hundred dollars (\$500.00) per calendar day will be charged. As actual damages for any delay in completion are impossible, the Contractor and his/her sureties shall be liable for, and shall pay to the Municipality of Mt. Lebanon in the sum of five hundred dollars (\$500.00) as fixed, agreed, and liquidated damages for each day of delay until the work is complete and accepted. Such liquidated damages are intended to represent actual damages and are not intended as a penalty. Contractor shall pay to Owner without limiting Owner's right to terminate this Agreement for default as provided elsewhere herein.
- B. The Contractor agrees that because of the extreme difficulty of fixing and ascertaining the true value of the damages which the Borough will sustain by the failure of the Contractor in the above paragraph, said listed sums are reasonable estimates of the damages which the Municipality owner will sustain. Such sums will be deducted from any monies due or that may become due to the Contractor, and if said monies are insufficient to cover said damages, then the Contractor shall pay the amount of the difference.

OCTOBER 2024

MT. LEBANON
POOL FILTRATION REPLACEMENT

C-97005-0075

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01110

SECTION 01250 - CONTRACT MODIFICATION PROCEDURES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

1.3 MINOR CHANGES IN THE WORK

- A. Engineer will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 1. Proposal Requests issued by Engineer are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
 2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Engineer.
1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Include costs of labor and supervision directly attributable to the change.
 5. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- C. Proposal Request Form: Use forms provided by Owner.

1.5 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Proposal Request, Engineer will issue a Change Order for signatures of Owner and Contractor.

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Work Change Directive: Engineer may issue a Work Change Directive. Work Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
1. Work Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Work Change Directive.
1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

OCTOBER 2024

MT. LEBANON
POOL FILTRATION REPLACEMENT

C-97005-0075

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01250

SECTION 01290 - PAYMENT PROCEDURES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections include the following:
 1. Division 1 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment. After award of the contract, the Contractor shall provide a Schedule of Values to the Construction Manager for review and approval. This Schedule of Values shall breakdown the necessary lump sum bid for use in reviewing Contractor's Applications for Payment and to provide a basis for discussion for any potential changes to the contract. Such Schedule of Values shall not be "unbalanced" in the sole opinion of the Construction Manager.

1.4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Construction Manager and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Progress payments shall be submitted to Construction Manager by the last of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.

- D. Payment Application Forms: Use forms provided by Owner for Applications for Payment. Sample copies are included at end of this Section.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Construction Manager will return incomplete applications without action.
1. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- F. Transmittal: Submit three (3) signed original copies of each Application for Payment to Construction Manager by a method ensuring receipt within twenty four (24) hours. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Contractor's Construction Schedule (preliminary if not final).
 3. Products list.
 4. Schedule of Values.
 5. Submittals Schedule (preliminary if not final).
 6. List of Contractor's staff assignments.
 7. List of Contractor's principal consultants.
 8. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 9. Initial progress report.
 10. Report of preconstruction conference.
 11. Certificates of insurance and insurance policies.
 12. Performance and payment bonds.
 13. Data needed to acquire Owner's insurance.
 14. Initial settlement survey and damage report if required.
- H. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. All Operation and Maintenance manuals requested, as per the contract specifications.
 4. Updated final statement, accounting for final changes to the Contract Sum.
 5. Evidence that claims have been settled.
 6. Final, liquidated damages settlement statement.
 7. Maintenance Bond in an amount equal to one hundred percent (100%) of the Final Contract Value for a period of one (1) year.

OCTOBER 2024

MT. LEBANON
POOL FILTRATION REPLACEMENT

C-97005-0075

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01290

01290 PAYMENT PROCEDURES

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SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, Approved Permits, and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Construction Schedule.
 - 2. Daily Construction Reports.
- B. Related Sections include the following:
 - 1. Division 1 Section "Payment Procedures".
 - 2. Division 1 Section "Submittal Procedures" for submitting schedules and reports.

1.3 CONSTRUCTION SCHEDULES AND DAILY CONSTRUCTION REPORTS

- A. Construction Schedule: Submit three (3) copies of the Construction Schedule to the Engineer a maximum of five (5) working days after Notice of Award. No work may begin until a Construction Schedule has been reviewed and approved by the Engineer.
- B. Daily Construction Reports: The Owner's Representative will submit daily inspection reports to the Engineer, at weekly intervals, to document the work in progress. Such Reports will form the basis for all Applications For Payment. All discrepancies between the Owner's Representative's Reports and the Contractor's Daily Construction Reports shall be resolved prior to submitting Applications For Payment to the Engineer.

PART 2 - PRODUCTS**2.1 SCHEDULE DEVELOPMENT**

- A. The Contractor shall consider the time required for initial and re-submittal reviews, material ordering, manufacturing, fabrication, and delivery during schedule development. Time extensions for delays due to submittal reviews and material availability will not be considered.

2.2 CONSTRUCTION SCHEDULE

- A. The Contractor shall prepare a schedule from the Notice of Award date through the anticipated Notice to Proceed date to the Substantial and Final Completion dates.
- B. Contract Modifications: The Contractor shall update the Construction Schedule for each proposed contract modification demonstrating the effect of the proposed change on the overall Construction Schedule.
- C. Preparation: The Contractor shall identify each significant construction activity separately with the first workday of each week clearly indicated.
1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities at a minimum:
 - a. Submittal preparation and processing including allowances for re-submittals.
 - b. Mobilization and demobilization.
 - c. Material ordering, fabrication, and delivery.
 - d. Installation and/or construction activities.
 - e. Work by Owner that may affect or be affected by Contractor's activities.
- D. Schedule Updating: Concurrent with revising the schedule, the Contractor shall include the following:
1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.
 4. Changes in activity durations in workdays.
 5. Changes in the Contract Time.
- E. Schedule Submittal: Submit initial Schedule with first set of submittals; updated Schedule with each Application for Payment and accelerated Schedule as requested by the Owner.
- F. Accelerated Schedule: Submit Accelerated Schedule as directed by Owner. No acceleration claim will be considered if, in the Owner's opinion, work was delayed by factors within the Contractor's control.

END OF SECTION 01320

SECTION 01322 – PHOTOGRAPHIC-VIDEO DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. Construction photographs.
 - 2. Digital versatile disk (DVD) or USB Flash Drive submittal.
- B. Related Sections include the following:
 - 1. Division 1 Section "Submittal Procedures" for submitting pre-construction documentation.

1.3 SUBMITTALS

- A. Construction Photographs: Submit two (2) prints of each photographic view within seven (7) days of taking photographs.
 - 1. Format: Digital pictures submitted on a digital USB Flash Drive.
- B. Digital Versatile Disk (DVD) or USB flash drive: Submit two (2) copies of each video recording within seven (7) days of recording video.
 - 1. Format: The DVD used for recordings shall be professional quality 12 cm color DVD media that conforms to either DVD-R or DVD+R recording standards using high quality DVD video and audio bitrates. No used DVD's will be allowed except when furnished by the Owner. The recorded DVDs shall be compatible for playback with any standard DVD-R or DVD+R player. The Owner reserves the right to reject the DVD because of poor quality, unintelligible audio or uncontrolled pan or zoom. Any DVD rejected by the Owner shall be re-videoed at no additional cost to the Owner.
 - 2. Video may also be submitted on a digital USB flash drive of appropriate size.

PART 2 - PRODUCTS**2.1 PHOTOGRAPHIC MEDIA**

- A. Digital Images: Provide images in uncompressed TIFF or JPEG format, produced by a digital camera with minimum sensor size of 4.0 megapixels, and at an image resolution of not less than 1024 by 768 pixels.

2.2 DVD/USB flash drive

- A. Recorder: All video recordings must, by electronic means, display continuously and simultaneously generated transparent digital information to include the date; the time of recording; stationing (if applicable); the name of the street (if applicable); the name of the easement or building being documented (if applicable); the name and location of the specific repair, and the project name. The video system shall have the capability to transfer individual frames of video electronically into hard copy prints or photographic negatives.
- B. Audio record: All video recordings shall contain a simultaneously recorded audio recording containing the commentary of the camera operator in order to assist the viewer with orientation and identification. The audio recording shall be free of any other voice communication. At the start of production and the beginning of any new street, building or right-of-way, an identification summary shall be read into the record while at the same time a wide angle view with numerical displays is provided for facial record. The Summary shall include: the DVD number (submission number); the name and location of the Project; the starting positional location of the recording; the date and time of the recording; the weather conditions and any and all other pertinent information.
- C. Camera: The color video camera used in the recording system shall have a horizontal resolution of 300 lines at center, a luminance signal to noise ratio of 45db, and a minimum illumination requirement of 25 foot-candles. The camera shall be adjusted to factory specifications and f-stop adjusted to optimum contrast. White balance pedestal, level and sync must be adjusted for factory recommended optimum performance under environmental conditions.
- D. Camera height and stability: When conventional wheeled vehicles are used as conveyances for the recording system, the distance between the camera lens and the ground shall not be less than twelve (12) feet. The camera shall be firmly mounted, such that the transport of the camera during the recording process will not cause an unsteady picture.

- E. Vehicle rate of travel: The vehicle rate of travel shall be proportional to the number, size and value of the surface features within the recording area. In high density development, the average rate of travel shall be no greater than thirty (30) feet per minute; in medium density development, the average rate of travel shall be no greater than sixty (60) feet per minute; in low density development, the average rate of travel shall be no greater than ninety (90) feet per minute; and in extra low density development, the average rate of travel shall be no greater than one hundred twenty (120) feet per minute. In all cases, it shall be the videographer's responsibility to determine the acceptable rate of travel to produce an end product acceptable to the Owner. At any time the Owner does not feel the video is acceptable, they may request the Contractor re-video the site at no additional cost to the Owner.
- F. Camera control: Camera pan, tilt, zoom-in, and zoom-out rates shall be sufficiently controlled such that recorded objects will be clearly viewed during DVD/digital playback. In addition, all other camera and recording system controls, such as lens focus and aperture, video level, pedestal, chrome, white balance and electrical focus, shall be properly controlled or adjusted to maximize recorded picture quality.
 - 1. A wide angle of area will be shown first, then a series of pans, zooms and tilts as may be necessary to accomplish a comprehensive view. Close-ups will be utilized as necessary to insure sufficient detail of items of interest. Progress shall continue linearly along the field of view, for example, one side of the roadway must be completed before commencing recording of the opposite side.
 - 2. Camera pans and tilts to be no faster than ninety (90) degrees of arc in a five (5)-second interval to assure maximum clarity of scene detail.
 - 3. Camera zoom to be no faster than a doubling of focal distance with in a one-half (1/2)-second interval. If zoom is capable of seventeen (17) to twenty (20) mm, then minimum time to perform a full zoom is three fifths (3/5) seconds.
 - 4. Each item of interest shall be clearly indicated in the video record for sufficient time to permit audio discussion and viewer comprehension.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

- A. The Contractor shall be required to take photographs of the project site to document all existing conditions that may be damaged within the project limits prior to beginning work. Specific attention shall be paid to all existing landscaped areas; paved or otherwise improved roadways and parking areas; fields; structures; signs; driveways; sidewalks; culverts; inlets; headwalls; retaining walls; fences; trees; manholes; vaults; inlets and any and all site features that may be damaged or that require restoration due to the contemplated Work. The Contractor shall take special effort to document cracks, breaks, and/or other damage and defects in existing features. All photography shall be done during times of good visibility. No photography shall be done during periods of visible precipitation, mist or fog or when more than ten (10%) percent of the ground area is covered with snow or standing water.
- B. General: Take in focus photographs using the maximum range of depth of field that clearly shows the Work. Photographs with blurry or out-of-focus areas will not be accepted.
 - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- C. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
 - 1. Date and Time: Include date and time in filename for each image.
- D. Pre-construction Photographs: Before starting construction, take photographs of the project site and surrounding properties, including existing items to remain during construction, from different vantage points.
 - 1. Flag and or mark project limits before taking construction photographs. Notify Owner and Construction Manager a minimum of forty eight (48)-hours in advance of beginning pre-construction photography. All residents effected by the work shall also be notified as a courtesy before any documentation commences.
 - 2. Take photographs to show existing conditions adjacent to property before starting the Work.
 - 3. Take photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
 - 4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
 - 5. Submit all Pre-construction photography to Owner and/or Construction Manager for approval prior to beginning work. Do not begin construction without Owner and/or Construction Manager approval of photography.
- E. Owner-Directed Construction Photographs: From time to time, the Owner may instruct the Contractor about number and frequency of photographs and general directions on vantage points. Select actual vantage points and take photographs to show the status of construction and progress since the last photographs were taken.

- F. Final Completion Construction Photographs: Take color photographs before requesting Final Completion for submission as Project Record Documents. The Owner may direct the Contractor for desired vantage points.
- G. Additional Photographs: The Owner may issue requests for additional photographs in addition to the specified periodic photographs.
 - 1. Three (3) day's notice will be given when feasible.
 - 2. Take additional photographs within twenty four (24) hours of request in emergency situations.
 - 3. Circumstances that could require additional photographs include, but are not limited to, the following:
 - a. Immediate follow-up when on-site events result in construction damage or losses.
 - b. Substantial Completion of a major phase or component of the Work.
 - c. Owner's request for special publicity photographs.
- H. Submit all Pre-construction photography to Owner and/or Construction Manager for approval prior to beginning work. Do not begin construction without Owner and/or Construction Manager approval of photography.
- I. Payment for photography other than pre-construction photography will be paid under applicable Contract provisions.

3.2 CONSTRUCTION VIDEOS

- A. The Contractor may take videos of the project sites in lieu of photographs to document all existing conditions that may be damaged within the project limits prior to beginning work. Specific attention shall be paid to all existing landscaped areas; paved or otherwise improved roadways and parking areas; fields; structures; signs; driveways; sidewalks; culverts; inlets; headwalls; retaining walls; fences; trees; manholes; vaults; inlets and any and all site features that may be damaged or that require restoration due to the contemplated Work. The Contractor shall take special effort to document cracks, breaks, and/or other damage and defects in existing features. All photography shall be done during times of good visibility. No photography shall be done during periods of visible precipitation, mist or fog or when more than ten (10%) percent of the ground area is covered with snow or standing water.
- B. General: Take in focus video using the maximum range of depth of field that clearly shows the Work. Videos with blurry or out-of-focus areas will not be accepted.
 - 1. Maintain key plan with each set of DVD's/USB Flash Drives that identifies each video location. All DVDs/USB Flash Drives and boxes shall bear labels with the following information: DVD/Flash Drive number; Owner's name; date of recording; Project name and number; and location and standing limit of video.

- C. Video Images: Submit video images exactly as originally recorded on the camera, without alteration, manipulation, editing, or modifications using image-editing software.
- D. Pre-construction Video: Before starting construction, take video of the project site and surrounding properties, including existing items to remain during construction, from different vantage points.
 - 1. Flag and or mark project limits before taking pre-construction video. Notify Owner and Construction Manager a minimum of forty eight (48)-hours in advance of beginning pre-construction recording. All residents effected by the work shall also be notified as a courtesy before any documentation commences.
 - 2. Take video to show existing conditions adjacent to property before starting the Work.
 - 3. Take video of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
 - 4. Take additional video as required to record settlement or cracking of adjacent structures, pavements, and improvements.
 - 5. Submit all Pre-construction video to Owner and/or Construction Manager for approval prior to beginning work. Do not begin construction without Owner and/or Construction Manager approval of video.
- E. Owner-Directed Construction Video: From time to time, the Owner may instruct the Contractor about number and frequency of video and general directions on vantage points. Select actual vantage points and take video to show the status of construction and progress since the last videos were taken.
- F. Final Completion Construction Video: Take video before requesting Final Completion for submission as Project Record Documents. The Owner may direct the Contractor for desired vantage points.
- G. Additional Video: The Owner may issue requests for additional video in addition to the specified periodic photographs.
 - 1. Three (3) days' notice will be given when feasible.
 - 2. Take additional video within twenty four (24) hours of request in emergency situations.
 - 3. Circumstances that could require additional video include, but are not limited to, the following:
 - a. Immediate follow-up when on-site events result in construction damage or losses.
 - b. Substantial Completion of a major phase or component of the Work.
 - c. Owner's request for special publicity photographs.
- H. Submit all Pre-construction video to Owner and/or Construction Manager for approval prior to beginning work. Do not begin construction without Owner and/or Construction Manager approval of video.
- I. Payment for video other than pre-construction video will be paid under applicable Contract provisions.

OCTOBER 2024

MT. LEBANON
POOL FILTRATION REPLACEMENT

C-97005-0075

END OF SECTION 01322

SECTION 01330 - SUBMITTAL PROCEDURES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Sections include the following:
1. Division 1 Section "Payment Procedures" for submitting Applications for Payment.
 2. Division 2 Sections for specific requirements for submittals in those Sections.

1.3 SUBMITTAL PROCEDURES

- A. Submit each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
- B. Processing Time: Allow enough time for submittal review, including time for re-submittals, as follows. Time for review shall commence on the Municipality's representative receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including re-submittals.
1. Initial Review: Allow ten (10) days for initial review of each submittal.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Re-submittal Review: Allow ten (10) days for review of each re-submittal.
- C. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately three-inch (3") by four-inch (4") on label or beside title block to record Contractor's review and approval markings and action taken by Owner's representative.
 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Contractor.
 - d. Name of manufacturer.
 - e. Submittal number or other unique identifier, including revision identifier.

- 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.01). Re-submittals shall include an alphabetic suffix after another decimal point (e.g., 06100.01.A).
 - f. Number and title of appropriate Specification Section.
 - g. Drawing number and detail references, as appropriate.
- D. Deviations: Highlight or otherwise specifically identify deviations from the Contract Documents on submittals.
- E. Re-submittals: Make re-submittals in same form and number of copies as initial submittal.
 1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked approved
- F. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- G. Use for Construction: Use only final submittals with mark indicating approval.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 REQUIRED SUBMITTALS

- A. The Contractor must submit the following items for approval prior ordering material and to the start of construction:
 1. Concrete Mix Designs
 2. Sealant
 3. Expansion Materials
 4. Bituminous Mix Designs
 5. Aggregate Material

6. Gutter System
 7. Any and All Pipe and Appurtenances
 8. Electrical Appurtenances
 9. Signage
 10. Deck Drains
 11. Schedule
- B. The above list may not be all inclusive. The Owner and/or Engineer reserves the right to require additional submittals at any time during the course of Work.

3.3 OWNER'S ACTION

- A. General: The Owner will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. The Owner will review each submittal and indicate "No exception taken", "Rejected", "Submit Specified Item", "Make Corrections Noted" or "Revise and Resubmit" using a submittal stamp.
- C. No material may be ordered or incorporated into the Work until the Contractor receives approval from the Owner, with submittals bearing the stamp "No exception taken". No consideration for payment will be made for materials ordered prior to receiving Owner approval.
- D. Any material incorporated into the work without Owner approval will be subject to removal and replacement with approved material by the Contractor at no additional cost to the Owner.

END OF SECTION 01330

SECTION 01770 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Warranties.
3. Final cleaning.

- B. Related Sections include the following:

1. Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Terminate and remove temporary facilities from Project site, construction tools, and similar elements.
3. Submit changeover information related to Owner's use, operation, and maintenance.

- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Construction Manager will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Construction Manager, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
 1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
 2. Submit certified copy of Construction Manager's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Construction Manager. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Submit all required closeout documentation including, but not limited to, maintenance bonds, release of liens, consent of surety, operation and maintenance binders, Allegheny County Health Department Signoff, etc. as required.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Construction Manager will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit **three** copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 1. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Construction Manager.
 - d. Name of Contractor.
 - e. Page number.

PART 2 - EXECUTION**2.1 FINAL CLEANING**

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01770

SECTION 02080 - PIPED UTILITIES - BASIC MATERIALS AND METHODS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Location maps and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

1. Piping joining materials.
2. Transition fittings.
3. Piped utility demolition.
4. Piping system common requirements.
5. Equipment installation common requirements.

1.3 DEFINITIONS

- A. Exposed Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions.
- B. PVC: Polyvinyl chloride plastic.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.
- B. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

1.5 COORDINATION

- A. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.
- B. Coordinate size and location of concrete bases. Formwork, reinforcement, and concrete requirements are specified in Division 2.

PART 2 - PRODUCTS**2.1 PIPING MATERIALS**

- A. Rain conductors shall match the existing diameter and shall be PVC Schedule 40 pipe with fittings.

2.2 PIPING JOINING MATERIALS

- A. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
- B. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
- C. Solvent Cements for Joining Plastic Piping:
 - 1. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

2.3 TRANSITION FITTINGS

- A. Transition Fittings, General: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.
- B. Plastic-to-Metal Transition Fittings:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Spears Manufacturing Co.
 - 2. Description: PVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-joint end.
- C. Flexible Transition Couplings for Underground Nonpressure Drainage Piping:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cascade Waterworks Mfg. Co.
 - b. Fernco, Inc.
 - c. Mission Rubber Company.
 - d. Plastic Oddities.
 - 2. Description: ASTM C 1173 with elastomeric sleeve ends same size as piping to be joined, and corrosion-resistant metal band on each end with a metal shield.

PART 3 - EXECUTION**3.1 PIPED UTILITY DEMOLITION**

- A. Disconnect, demolish, and remove piped utility systems, equipment, and components indicated to be removed.
 - 1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - 2. Piping to Be Abandoned in Place: Drain piping. Fill abandoned piping with flowable fill, and cap or plug piping with same or compatible piping material.
 - 3. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make operational.
- B. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.2 PIPING INSTALLATION

- A. Install piping according to the following requirements and Division 2 Sections specifying piping systems.
- B. The sketch maps indicate general location and arrangement of piping systems.
- C. Install piping at indicated slopes.
- D. Install piping free of sags and bends.
- E. Install fittings for changes in direction and branch connections.
- F. Select system components with pressure rating equal to or greater than system operating pressure.

3.3 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 2 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Plastic Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:

1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
 2. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
 3. PVC Nonpressure Piping: Join according to ASTM D 2855.
- E. Plastic Nonpressure Piping Gasketed Joints: Join according to ASTM D 3212.
- F. Plastic Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
1. Plain-End PE Pipe and Fittings: Use butt fusion.
 2. Plain-End PE Pipe and Socket Fittings: Use socket fusion.
- G. Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.

END OF SECTION 02080

SECTION 02300 - EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Location maps and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

- 1. Preparing walks, pavements, lawns and grasses and landscaping.

- B. Related Sections include the following:

- 1. Division 1 Section "General Specifications" for general project requirements.

1.3 DEFINITIONS

- A. Base Course: Course placed between the subgrade course and footers, slabs on grade, foundations, sidewalks, concrete pavement and hot mix asphalt paving.
- B. Borrow: Satisfactory soil material, free of organic or other deleterious material imported from off-site for use as fill or backfill.
- C. Drainage Course: Course of washed granular material meeting AASHTO 57 limestone requirements supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
- D. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
 - 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by the Engineer and Owner's Representative. Authorized additional excavation and replacement material will be paid for according to Contract provisions.
 - 2. Earth Excavation: Removal of all material not specifically defined as topsoil or rock and shall include and not be limited to muck, hardpan, soft shale, loose, disintegrated or decomposed ledge rock which can be removed by the means of bulldozers with hydraulic attachments having single tooth rippers.
 - 3. Satisfactory Material: Soil whose composition is satisfactory for use in embankment construction. In general, any mineral (inorganic) soil, blasted or broken rock, and similar materials of natural or man-made origin, including mixtures thereof.

4. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Engineer or Owner's Representative. Unauthorized excavation, as well as remedial work directed by the Engineer or Owner's Representative, shall be without additional compensation.
 5. Unsatisfactory Material: Any soil containing vegetation or organic matter, such as muck, peat, organic silt, topsoil or sod, which is not satisfactory for use in embankment construction or for support of permanent structures. Certain manmade deposits such as land-fill material may also be determined to be unsatisfactory material.
- E. Fill: Soil materials used to raise existing grades.
- F. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cubic yard of trench excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:
1. Late-model, track-mounted hydraulic excavator; equipped with a 42-inch wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,090 lbf and stick-crowd force of not less than 18,650 lbf; measured according to SAE J-1179.
- G. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below base, drainage fill, or topsoil materials.
- H. Topsoil: Natural or cultivated surface-soil layer containing not less than 2% nor more than 10% of organic matter, as specified in AASHTO designation T194. The material contains sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than two (2) inches in diameter. Topsoil shall be free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.
- I. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

- A. Product Data: For the following:
1. Each type of geotextile and stone

1.5 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities unless permitted in writing by the Municipality and then only after arranging to provide temporary utility services according to requirements indicated.
1. Notify Municipality not less than two days in advance of proposed utility interruptions.
 2. Do not proceed with utility interruptions without the Municipality's written permission.
 3. Contact utility-locator service for area where Project is located before excavating.

- B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrowed materials when sufficient satisfactory soil materials are not available from excavations.
- B. Base Material: PennDOT 2A limestone
- C. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and 0 to 5 percent passing a No. 4 sieve.
- D. Sand: ASTM C 33, fine aggregate, natural, or manufactured sand.
- E. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW (well graded gravel), GP (poorly graded gravel), GM (silty gravel), SW (well graded sand), SP (poorly graded gravel), and SM (silty sand) or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- F. Unsatisfactory Soils: ASTM D 2487 Soil Classification Groups GC (clayey gravel), SC (clayey Sand), CL (lean clay), ML (silt), OL (organic clay), CH (fat clay), MH (elastic silt), OH (organic silt), PT (peat), expansive or carbonaceous shales and soils that cannot maintain an optimum moisture content of two (2) percent at the time of compaction or a combination of these groups.

2.2 GEOTEXTILES

- 1. Subsurface Drainage Geotextile: Shall comply with the requirements of a Class 1 geotextile in Section 735 in the current edition of PennDOT's Publication 408.
- 2. Separation Geotextile: Shall comply with the requirements of a Class 4 geotextile in Section 735 in the current edition of PennDOT's Publication 408.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations
- B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding and collecting on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
- C. Provide and maintain all temporary drainage and dewatering systems, such as pumps, sumps and discharge lines as required.
- D. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
- E. During grading operations, pits, cuts, excavation areas and/or embankments and subgrades shall be shaped, sloped and maintained to facilitate drainage of surface water. Existing drainage routes shall not be choked or obstructed until new ones are available. Temporary culverts, pumps or other equipment shall be used to facilitate drainage of fills during construction.
- F. Care must be exercised in the control plan to avoid discharge of surface flows across watershed lines.

3.3 GENERAL EXCAVATION AND FILLS REQUIREMENTS

- A. The Contractor shall be responsible for all excavation of whatever material encountered. The excavation is unclassified, and the contractor will be responsible for all excavation required through all types of soil / rock.
- B. The Contractor shall remove all soil, rock and other material, and utilize or dispose of these materials.
- C. The Contractor shall complete excavation and fill procedures to the subgrade surface elevations which conform to the finished grades.
- D. The Contractor shall always be responsible for carrying out all excavation operations in a safe and prudent manner so that all persons and property will be protected from hazard.
- E. In the event the Contractor disposes of too much excavated material, he shall replace this material as necessary and required, at his own cost and expense. Material to be replaced shall meet the requirements for satisfactory material as specified herein and shall be subject to the approval of the Engineer.
- F. The existing base may consist of the following materials such as asphalt, plain concrete, reinforced concrete, coarse aggregate, cinders, sand, slag, rock and earth. The removal of base shall include the removal of any concrete slabs encompassing manholes, utility boxes, utility lines, and trench lines.

- G. The Contractor shall provide all necessary measures to control dust using water, calcium chloride, or other material approved by the Engineer, at such locations and during such periods as he may direct, or as may be required by Local Ordinance or Authorities.
1. Calcium Chloride shall be spread in pellet or flake form by approved devices so that uniform distribution is attained over the entire area being treated.
 2. Watering equipment shall consist of pipelines, tanks, tank trucks or other approved devices capable of applying a uniform spread of water over the surface. A suitable device for regulating the flow and positive shut-off the water shall be provided for positive control by the operator.
 3. The Engineer will advise the Contractor of any unsatisfactory procedures for dust control. If the unsatisfactory procedures are not corrected promptly, the Engineer may suspend the performance of any or all construction until the condition has been corrected.

3.4 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades to a tolerance of one-half ($\frac{1}{2}$) of an inch.
- B. The depth of excavation and removal of existing sidewalk shall be seventeen (17) inches minimum.
- C. The depth of excavation and removal of existing driveway shall be seventeen (17) inches minimum.
- D. The depth of excavation and removal of existing curb shall be as indicated on the appropriate curb detail.

3.5 DISPOSAL OF MATERIAL OUTSIDE OF THE WORK SITE

- A. The Contractor shall dispose all waste and excess materials outside the work site and shall pay all costs incurred, therefore.
- B. When any material is to be disposed of outside the work site, the Contractor shall first obtain a written permit from the property owner on whose property the disposal is to be made and he shall file with the Owner said permit or a certified copy thereof, together with a written release from the property owner, absolving the Owner from any and all responsibility in connection with the disposal of material on said property.
- C. Contractor in disposing of waste and excess materials shall comply with all Federal, State and Local governmental rules, regulations, laws and ordinances concerning such disposal of waste and excess materials.

3.6 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavations under pavement, sidewalks, landscaping areas, utilities, sewer lines and other construction areas shall be filled with satisfactory soil to subgrade in accordance with the soil fill requirements.

3.7 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, subdrainage.
 - 2. Removing concrete formwork.
 - 3. Removing trash and debris.
 - 4. Removing temporary shoring and bracing.
 - 5. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.8 GRADING

- A. General: 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.
 - 3. Slope grades to direct water away from buildings and to prevent ponding.

3.9 GEOTEXTILE INSTALLATION

- A. The Contractor shall be required to install Class 4 geotextile fabric on the subgrade prior to installing the stone subbase.
 - 1. The Contractor shall install the Class 4 non-woven geotextile fabric in accordance with the requirements set forth in Section 212 in the current edition of the Pennsylvania Department of Transportation's Publication 408. The maximum overlap between rolls is twelve (12) inches with no additional compensation for the cost of the overlapping or pins required for installation.
 - 2. The geotextile shall be pinned to the sub-base using eight (8) penny aluminum nails spaced twelve (12) inches center to center.
 - 3. Protect the geotextile fabric from damage and install the subbase material on it the same day.

3.10 SUBBASE FOR PAVEMENT AND WALKS

- A. For Concrete Pavement install nine (9) inches, for Bituminous Pavement install six (6) inches and for Brick Pavement install five (5) inches of PennDOT 2A limestone on the prepared subgrade free of mud, frost, snow, or ice.
- B. For Concrete Driveways install eleven (11) inches, for Bituminous Driveways install eleven (11) inches and for Brick Driveways install thirteen (13) inches of AASHTO #57 limestone on the prepared subgrade free of mud, frost, snow, or ice.
- C. For Concrete and Brick Sidewalks install thirteen (13) inches of AASHTO #57 limestone on the prepared subgrade free of mud, frost, snow, or ice.
- D. Place subbase six (6) inches or less in compacted thickness in a single layer.
- E. Compact subbase course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than ninety-five (95) percent of maximum dry unit weight according to ASTM D 1557.

3.11 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations
 1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

END OF SECTION 02300

SECTION 02310 – TRENCH EXCAVATION AND BACKFILL FOR SEWERS AND UTILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Location maps and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes trench excavation and backfill for sewers and utility trenches, with the following components:
 1. Concrete Encasement
 2. Rock Excavation Requirements
 3. Unsuitable Excavation Requirements
 4. Soil Excavation Requirements
 5. Limestone or Aggregate Backfill
 6. Clean Fill Backfill

1.3 DEFINITIONS

- A. Penn D.O.T.: Pennsylvania Department of Transportation
- B. Backfill: Soil material or aggregate material used to fill an excavation.
 1. Aggregate Backfill: Limestone.
 2. Standard Backfill: Onsite material approved by the Engineer or Owner's Representative.
- C. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil, **free of organic or other deleterious material** imported from off-site for use as backfill.
- E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by the Engineer and Owner's Representative. Authorized additional excavation and replacement material will be paid for according to Contract provisions.
 2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Engineer or Owner's Representative. Unauthorized excavation, as well as remedial work directed by the Engineer or Owner's Representative, shall be without additional compensation.

02310 TRENCH EXCAVATION AND BACKFILL
FOR SEWERS AND UTILITIES

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- F. Fill: Soil materials used to raise existing grades.
- G. Pipe Zone: The area from one half (0.5) foot below the bottom of the pipe to one (1) foot above the top of the pipe for the full width of the trench.
- H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cubic yard of trench excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:
 - 1. Late-model, track-mounted hydraulic excavator; equipped with a 42-inch wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,090 lbf and stick-crowd force of not less than 18,650 lbf; measured according to SAE J-1179.
- I. Utilities: On-site underground pipes, conduits, ducts and cables within the project limits.

1.4 SUBMITTALS

- A. Product Data: For the following:
 - 1. Penn D.O.T. limestone certification forms from the supplier
 - 2. Concrete design and certifications from the supplier

PART 2 - PRODUCTS

2.1 AGGREGATE MATERIALS

- A. Limestone or Crushed Aggregate: Meeting specifications set for in Section 703 in the current edition of Penn D.O.T. Publication 408 for AASHTO No. 57 limestone or PennD.O.T. 2A limestone, No gravel is permitted.
- B. Sand: ASTM C33, fine aggregate, natural, or manufactured sand.

2.2 SOIL MATERIALS

- A. Soil Material: Fine, clean earth soil material free from large stones, clods, topsoil, sod, frozen earth, wood or any other objectionable material as determined by the Engineer or Owner's Representative.
- B. Unsuitable Soil Material at Bottom of Trench: Soil material at the bottom of the trench unable to support the pipe and backfill, as determined by the Engineer.

PART 3 - EXECUTION**3.1 GENERAL REQUIREMENTS**

- A. The Contractor shall be responsible for the protection of all utilities in the trench zone. All damage to gas, water, telephone, power, cable or sewer lines shall be repaired immediately as an emergency at the Contractor's expense. In no event shall any utility service remain interrupted overnight.

3.2 TRENCH EXCAVATION

- A. The Contractor shall protect the installation of the pipe at all times during construction.
- B. Trench excavation shall conform to the line and grade of the sewer or utilities
- C. All excavations shall be kept free from water, snow and ice during construction.
- D. The excavation of the trench shall not advance more than 100 feet ahead of the pipe laying and masonry work, except where it is absolutely necessary because of site conditions.
- E. Mats shall be placed for excavation equipment where damage could be caused to existing pavements.
- F. The minimum trench width shall be the outside diameter of the pipe plus twelve (12) inches on both sides of the pipe to ensure proper compaction of the bedding and backfill. The maximum trench width shall conform to current ASTM and OSHA requirements predetermined by the depth of the excavation. No additional compensation shall be awarded for any trench width over those standards.
- G. The bottom of the trenches shall be prepared to conform to the grade of the pipe and the bottom of the foundation of structures. Special precautions shall be exercised to insure that pipes, when installed, will not rest on rock, masonry or any other material that would present a non-uniform foundation. Where two or more pipes are to be laid in the same trench, the Contractor shall excavate the trench so that all pipes are laid in conformance with the specified pipe bedding, or better.

3.3 ROCK EXCAVATION

- A. Under this item the contractor will be responsible for providing all necessary equipment and labor to excavate rock/bedrock/boulders from sanitary sewer trenches for the removal/installation of replacement/new sanitary sewers.
- B. This item shall include the mobilization of all necessary specialized machinery/hydraulic hammers, compressors, etc. to and from the site.
- C. The contractor will be responsible for the disposal of the excavated rock under this item, no additional compensation will be provided.

- D. All quantities of rock shall be measured with the Municipality representative prior to placement of pipe and backfill; otherwise payment will not be considered.

3.4 PIPE BEDDING

- A. Fine Aggregate Bedding: The sanitary pipe bedding shall consist of a minimum of six (6) inches of AASHTO No. 57 stone. No slag or pea gravel shall be permitted. The bedding shall be installed the entire width of the trench. The bedding shall be compacted using mechanical compaction equipment.

3.5 TRENCH BACKFILL FOR SEWERS AND SEWER STRUCTURES

- A. Backfill requirements shall be per the Construction Plans
- B. The backfill in the Pipe Zone shall consist of AASHTO No. 57 stone and shall be compacted in layers six inches (6") in depth. The backfill shall compacted using mechanical compaction equipment.
- C. All backfill material shall be compacted using mechanical compaction equipment.
- D. Backfilled areas which settle shall be corrected at the Contractor's expense.
- E. All unsuitable soil material at the bottom of a trench shall be removed to such a depth as the Engineer may direct, and backfilled with suitable granular material obtained from the project excavation or granular material from on approved offsite source.

3.6 UNSUITABLE MATERIALS

- A. If unsuitable bedding material is found at the trench bottom the contractor shall be required to excavate below grade and backfill the trench with AASHTO No. 57 stone which meet the specifications set forth in the 2000 Edition of the Pennsylvania Department of Transportation's Publication 408, Section 703.2(c), Table C.
- B. Pipe foundation material will be paid for on a tonnage basis calculated as follows:
1 cubic yard of material = 3,000 lbs.
- C. In calculating the above, the trench width used shall be 4/3 of the outside diameter of the pipe plus 1 foot 4 inches and the depth shall be as placed minus 6 inches for the required bedding. The depth shall be measured from the bottom of the pipe.

END OF SECTION 02310

SECTION 02630 - STORM DRAINAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Location maps and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes storm drainage outside the building, including but not limited to the following components:

1. Drains and piping.
2. Storm inlets and catch basins

1.3 DEFINITIONS

- A. *HDPE: High Density Polyethylene Pipe*
- B. *HDPE: High Density Polyethylene Pipe - Perforated*

1.4 SUBMITTALS

- A. Product Data: For the following:
 1. Special pipe fittings.
 2. Pipe and fittings
 3. Manhole, catch basin and storm inlet frames, covers and/or grates
- B. Shop Drawings: Four (4) copies of the following shall be submitted for approval:
 1. Storm Inlets: Concrete design mix, 28-day compressive strength as well as the design certification from the manufacturer that the structure will support the design load.
 2. Storm Manholes
 3. Storm Sewer Frames and Grates
 4. Storm Sewer Pipes

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic pipes and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.

- C. Handle manholes, catch basins and storm inlets according to manufacturer's written rigging instructions to prevent damage to the structures.

1.6 PROJECT CONDITIONS

- A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
1. Notify Engineer no fewer than two working days in advance of proposed interruption of service.
 2. Do not proceed with interruption of service without Engineer's written permission.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include but are not limited to, manufacturers specified.
 2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 PIPING MATERIALS

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe, fitting, and joining materials.

2.3 CONCRETE

- A. General: Cast-in-place concrete according to ACI 318/318R, ACI 350R, and the following:
1. Cement: ASTM C 150, Type II.
 2. Fine Aggregate: ASTM C 33, sand.
 3. Coarse Aggregate: ASTM C 33, crushed gravel.
 4. Water: Potable.
- B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water-cementitious materials ratio.
1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
 2. Reinforcement Bars: ASTM A 615/A, Grade 60, deformed steel.

3. All wire fabric and reinforcement bars shall be free of scale, oil, ice and structural defects and shall be stored to prevent contact with the ground.
- C. Inlets and Catch Basin Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.
1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to *one-half* of pipe diameter. Form curved channels with smooth, uniform radius and a *minimum of* two (2) percent slope through the manhole.
 2. Benches: Concrete, sloped to drain into channel at a minimum of four (4) percent.

2.4 MORTAR

- A. General: Shall be composed of one (1) part Portland cement and two (2) parts sand by volume. Hydrated lime, not to exceed four (4) pounds of lime to each bag of cement, may be added if approved by the Engineer. Material requirements shall be as follows:
1. Portland Cement: shall conform to the requirements of AASHTO Designation M-85, Type II.
 2. Hydrated Lime: shall conform to the requirements of ASTM C-6.
 3. Mortar Sand: shall conform to the requirements of AASHTO M-45, except the aggregate shall be no coarser than #8 sieve size.
 4. Water: shall be clean and contain no foreign matter such as oil, vegetation, acid, salts organic matter, etc. The water shall be from a municipal water system.
- B. Mortar shall be mixed in a machine mixer, except when the amount of mortar to be used makes it undesirable. If hand mixing is used, the dry ingredients must be mixed thoroughly in a box prior to adding the proper quantity of clean water. The water shall be gradually added and then the materials shall be hoed or worked until a uniform mixture is prepared. No mortar shall be retempered, and none shall be used more than one and one-half (1 1/2) hours after initially mixed. All excess mortar must be discarded after each day of work has been completed.

2.5 LADDER RUNGS

- A. Shall be made of polypropylene meeting the requirements of ASTM D-4101 surrounding a $\frac{1}{2}$ " grade 60 deformed reinforcing bar meeting ASTM A-615 requirements. A $1 - \frac{1}{2}'' \times \frac{1}{2}''$ reflector is to be installed at both ends of the ladder rung.

2.6 MANHOLES

- A. Standard Precast Concrete Manholes: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints. The concrete shall have a minimum compressive strength of 4000 p.s.i.
1. Inside Diameter: 48 inches minimum.

2. Ballast and Base Section: Construct as shown on the construction detail. The base, ballast and floor sections shall be monolithically poured in accordance with ASTM C 478.
3. Joints: Shall be tongue and groove type formed in such a manner so that the joint sealant material can be applied evenly.
4. Benched Inverts: Benched inverts shall be either monolithically poured with the base either in the factory or poured on site after the manhole and pipes have been installed.
5. Riser Sections: Six (6) inches minimum wall thickness with lengths varying to obtain proper depth.
6. Top Section: Construct as shown on the construction detail. Top of cone of size that matches grade rings. The top of cone or top section shall be cast with insert holes to receive the anchor bolts shown on the construction detail.
7. Joint Sealant: ASTM C 990, bitumen or butyl rubber or cement grout.
8. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection.
9. Ladder Rungs: Construct as shown on the construction detail.
10. Grade Rings: Brick and mortar up to six (6) inches in height or steel rings six (6) to twelve (12) inches in height. The grade rings/brick shall match the diameter and thickness of the manhole frame and cover. All steel grade rings shall be designed with anchor bolts matching the location of the holes in the frame.
11. Protective Coating: Plant-applied, SSPC-Paint 16, coal-tar, epoxy-polyamide paint 10-mil minimum thickness applied to exterior surfaces.
12. Manhole Frames and Covers: Install as shown on the construction detail. All frames and covers shall fit together in a satisfactory manner to prevent rocking, rattling or shifting in traffic. The frame shall be designed with anchor bolts matching the location of the holes in the top section of the manhole. All frames and covers shall be grey cast iron and meet the specifications set forth in the latest revisions of AASHTO M-105, Class 30. The cover shall include the word "STORM" stamped or cast into the cover a minimum of two (2) inches in height.
13. Identification: All structures shall have the identification number and manufacturer's name stamped on each section.

2.7 STORM INLETS

- A. Standard Precast Concrete Storm Inlets: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
1. Base Section: 6-inch minimum thickness for integral floor slab and walls. The storm inlet shall be constructed as shown on the construction detail.
 2. Riser Sections: 6-inch minimum thickness and heights to provide depth indicated.
 3. Joint Sealant: ASTM C 990, bitumen or butyl rubber or cement grout, if required.
 4. Pipe Entrance Holes: The inlet boxes shall come with the proper hole sizes for the pipes being installed in the locations where the pipes shall be installed. The pipes shall be encased in mortar on both the inside and outside of the storm inlet wall to ensure a tight seal. The inside wall of the inlet shall have a smooth finish.
 5. Ladder Rungs: Install ladder rungs in inlets greater than four (4) feet in depth as measured from the floor slab to the grate.
 6. Storm Inlet Frames and Grates: Install as shown on the construction detail. The frame shall be designed with anchor bolts matching the location of the holes in the top section

- of the inlet. All frames and grates shall be grey cast iron and meet the specifications set forth in the latest revisions of AASHTO M-105, Class 30, unless otherwise indicated.
7. Sewer Brick for Adjustments: All sewer brick shall meet the specifications set forth in the latest revision of AASHTO Designation M-91, Grade SS.
 8. Weep Holes: insert a one (1) inch diameter PVC pipe or drill a one (1) inch diameter hole into the wall.
- B. Inlets shall be constructed in accordance with the standard detail shown on the plans. In lieu of pre-cast inlets, poured-in-place inlets may be used.
- C. Inlets, depending on location, may or may not be installed with a hood. All inlet types should be specified by the Engineer prior to ordering/installing any structure.
- D. Grates used at specific locations will be specified by the Engineer or Municipal Representative. Grate types can be vane grates or diagonal bar grates.

2.8 YARD DRAINS

- A. NDS 24" Square Catch Basin is to be installed at locations indicated on the Construction Plans.
- B. All Manufacturers requirements should be followed for the installation of the drains.

2.9 BRICK FOR MANHOLE AND INLETS

All brick used for the construction of storm structures shall meet the requirements of ASTM C32.

PART 3 - EXECUTION

3.1 TRENCH EXCAVATION AND BACKFILL

- A. Excavation, trenching, and backfilling are specified in Division 2 Section "Trench Excavation and Backfill for Sewers and Utilities."

3.2 PIPING INSTALLATION

- A. General Locations and Arrangements: Install all drainage structures and pipes in the locations shown on the Construction Plan and/or as directed by the Engineer. Pipe shall be of the type and size specified and shall be laid accurately to line and grade. Structures shall be accurately located and properly oriented. Pipe shall be laid upgrade unless otherwise approved by the Engineer. The Contractor shall use laser beam equipment to control the grade of the trench bottom as well as for pipe grade.
- B. Where specific installation specifications are not indicated, follow piping manufacturer's written instructions, unless otherwise indicated

- C. Bell and spigot pipe shall be laid with the bell end upgrade; tongue and groove pipe shall be laid with the groove end upgrade. The pipe shall be jointed so that there will be uniform space around the pipe. Trimming of the pipe shall not be allowed.
- D. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.
- E. All storm sewer pipe repaired shall consist of the same material as the pipe which was removed. In the case of corrugated metal pipe, it shall be replaced with the type specified on the Construction Plan, approved equal.
- F. Install catch basins, storm inlets and/or drains at changes in direction and slope.
- G. Install gravity-flow, nonpressure drainage piping according to the following:
 - 1. Install piping with a minimum cover of three (3) feet, unless otherwise indicated.
 - 2. Install piping according to manufacturers recommendations.
- H. Clear interior of piping and storm drainage structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.
- I. All pipes entering structures shall be cut flush with the inside face of the structure, unless otherwise specified by the Engineer. The cut ends of the pipe and the surface of the structure shall be properly rounded and finished so that there will be no protrusion, ragged edges or imperfections that will impede the flow of water or affect the hydraulic characteristics of the installation. (Pipe sections shall be cut to size before setting in the trench). Reinforcing shall not be left exposed in a cut section of Reinforced Concrete Pipe. Only full sections of pipe shall be used where entering a structure which will be exposed to view, such as end walls, headwalls, end sections, etc.
- J. The Contractor shall always protect the installation during construction. Movement of construction equipment, vehicles and loads over and adjacent to any pipe shall be performed at the Contractor's risk. At all times when pipe laying is not in progress, all open ends of pipes shall be closed by approved temporary watertight plugs. If water is in the trench when work is resumed, the plug shall not be removed until the trench has been pumped dry and all danger of water entering the pipe has passed.
- K. The Contractor may need to adjust the line and grade of the new storm sewer to avoid conflicts with utility service lines.
- L. The Contractor may need to remove existing storm sewer to lay the new storm sewer pipe at no additional cost.
- M. The pipe shall be laid on a 6" bed of AASHTO No. 57 limestone. No slag or gravel will be permitted.
- N. The storm sewer pipe will be backfilled to 1' above the pipe with AASHTO No. 57.

- O. Within eight (8) feet from the back of curb, under sidewalk, and under driveways the trench shall be backfilled from one (1) foot above the pipe to seventeen (17) inches below final grade with AASHTO #57 limestone. The remaining seventeen (17) inches of the trench shall be backfilled in accordance with the appropriate section of the specifications (i.e. concrete sidewalk restoration, bituminous pavement restoration, concrete pavement restoration, etc.)
- P. Backfilling requirements should be in accordance with the Construction plans.
- Q. All trenches are to be shored in accordance with all applicable safety standards.
- R. The Contractor's attention is called to the fact that the backfilling must be thoroughly compacted to avoid settlement. The Contractor will ensure the compaction of the materials via the use of a mechanical whacker.
- S. The Contractor will be responsible for making temporary connections to the existing storm sewer system to maintain the storm sewer drainage system. The cost associated with this will be incidental to this item.
- T. Each repair shall be free of debris, offset joints, etc. and meet the approval of the Municipality's authorized representative prior to acceptance.
- U. Any areas outside the limits of work which are disturbed by the Contractor shall be restored to their original or better condition at the expense of the Contractor.
- V. The contractor shall be aware that sanitary sewer repairs necessary will be completed under this item regardless of the size of the sanitary sewer, depth of the sanitary sewer, and type of material that the sanitary sewer is. It is the intent of this item to only repair sanitary sewers damaged during work on the storm sewers. Therefore, the contractor will be reimbursed for the depth of the excavation under the point repair item.
- W. During installation of storm sewers, the Contractor shall excavate and locate any utilities that may exist so that adjustments can be made to the storm sewers, if necessary. **The Contractor must verify the depth of existing underground utilities to determine if conflicts exist before any pipe installation takes place. If there is a conflict, the project engineer must be notified immediately.**
- X. The new sewer pipe shall be laid at the same grade as the existing pipe. In the case of sags in the existing pipes being removed, the new pipe shall be laid at the slope to provide positive drainage.

3.3 PIPE JOINT CONSTRUCTION

- A. Basic pipe joint construction shall follow piping manufacturer's written instructions.
- B. Join gravity-flow, nonpressure drainage piping according to the following:
 1. Join corrugated Polyethylene piping according to CPPA 100.

3.4 STORM DRAINAGE STRUCTURE INSTALLATION GENERAL REQUIREMENTS

- A. Install storm drainage structures complete with appurtenances and accessories in the location and to the depth shown on the Contract Location Maps. Install all storm drainage structures as shown on the construction detail.
- B. No concrete or masonry shall be laid when the temperature is below forty (40) degrees Fahrenheit, or when indications are for lower temperatures within twenty-four (24) hours, unless protection of concrete and masonry is provided. In this event, the Contractor shall take such measures to prevent concrete and masonry from being exposed to freezing temperatures for a period of not less than five (5) days after installation. Any damage to the structure because of freezing shall be corrected by the Contractor at his own expense.
- C. Storm drainage structures are to be constructed as soon as the pipe laying reaches the location of the structure. Should the Contractor continue his pipe laying without making provision for completion of the storm drainage structure, the Engineer shall have the authority to stop the pipe laying operations until the structure is completed.
- D. In constructing storm drainage structures the Contractor shall accurately locate each structure and set accurate templates to conform to the required line and grade. Any storm drainage structure which is mis-located or oriented improperly shall be removed and rebuilt in its proper location, alignment and orientation at the Contractor's expense.
- E. All storm drainage structures located in or adjacent to a pavement subgrade shall be provided with weep holes at appropriate elevations to completely drain the subgrade.
- F. Unless otherwise specified, all storm drainage structures shall be constructed on foundations constructed of AASHTO No. 57 limestone, and all foundations shall rest on firm ground of uniform bearing a minimum of four (4) inches in depth.
- G. Masonry: All bricks shall be thoroughly wetted before lying. All masonry shall be laid in a full bed of mortar, and all vertical and horizontal joints shall be filled solid with mortar. Vertical joints on each succeeding course shall be staggered. Joints shall be not less than 3/8 inch or more than 1/2 inch wide. Joints on the inside of the structure shall be neatly struck and pointed. The exterior surface of the masonry walls shall be plastered with a one-half (1/2) inch coat of 1:2 cement mortar.
- H. Inverts: Smooth concrete invert channels shall be constructed in all storm drainage structures with a true semi-circle channel to insure a smooth flow of water through the structure. Half pipe and fittings shall be used in the pipe invert, wherever practical. The invert channels shall be carried up to the elevations shown on the Contract Location Maps. Channels shall slope smoothly and evenly from the entrance pipes to the outlet pipe for storm drainage structure that do not have sumps. *The bottom of the structure shall be poured to provide positive drainage and continuous concrete channels.*
- I. Frames, Covers and/or Grates: Frames, Covers and/or Grates storm drainage structure shall be of the type and size indicated by the Engineer or Municipal Representative. Frames shall be bedded in mortar a minimum of one (1) inch thick, anchored with 3/4" bolts, and shall be set accurately to the correct alignment and grade. In areas to be paved, frames shall be set by using four (4) points of reference, set ninety (90) degrees apart, to ensure accurate setting to proposed

pavement grade. Covers and grates shall be installed properly to eliminate the potential of rocking in the frame.

- J. Ladder Rungs: Ladder rungs shall be installed in all storm drainage structures greater than five (5) feet in depth unless otherwise specified. Ladder rungs shall be installed in all storm drainage structures, spaced twelve (12) inches on center vertically. The maximum distance from the top of the manhole casting to the first step shall be no greater than eighteen (18) inches.
- K. Set tops of frames and covers flush with finished surface.
- L. Storm inlet and catch basin frames and covers in pavement areas shall be set one half (1/2) inch lower than the final surface elevation, unless otherwise indicated.
- M. This item shall also include any required sewer connection from the existing pipe to the new inlets or manholes.
- N. Pre-cast storm drainage structures shall be installed only after Shop Drawings have been approved by the Engineer.
- O. The top grade of the pre-cast concrete manhole cover and catch basin/storm inlet section shall be set at grade or sufficiently below finished grade to permit a maximum of two (2) courses of brick to be used as risers to adjust the grade of casting. Manhole, catch basin and storm inlet frames shall be set on a grout pad as specified.
- P. Concrete grade rings may be used between the top section and the structure's frame to meet existing grades up to twelve (12) inches were required. All grade rings shall have holes in them to allow for the casting to be connected to the last concrete section with three quarter of an inch (3/4") diameter bolts. The holes around the bolts shall be grouted after installation with non-shrink grout.
- Q. The steps shall be installed during the casting of the structure and aligned in accordance with the construction detail.
- R. Inlets and Manholes shall be constructed in accordance with the specifications. In lieu of pre-cast inlets, poured-in-place inlets may be used. If poured in place inlets are used, the contractor will be required to place forms on the outside of the inlet, "wild" pours will not be permitted. Poured -in- place inlets will have a minimum wall and base thickness of eight (8) inches and will be reinforced with number four re-bar 12" center to center, both ways. All inlets over three (3) feet in depth, measured from the top of grate to downstream invert, will have steps installed, per the construction detail. All backfilling around the inlets shall be completed with compacted AASHTO #57 aggregate.
- S. Inlets shall have grates, cast iron frames and castings as shown on the construction details.
- T. Weep holes shall be installed in the inlet boxes for the drainage of the AASHTO No. 57 limestone around the storm pipe. A total of four (4) holes shall be placed on either side of the storm sewer pipe at the spring line of the pipe.

- U. All manholes and inlets shall have concrete inverts poured to direct the flow of water and to aid in self cleaning. This item shall also include any required sewer connection from the existing pipe to the new inlet.
- V. All manholes and inlets shall have at least a final course of **6" of common red brick** to allow for future adjustment. The top of grate shall be approximately 1/4" below the proposed roadway elevation. The frames and grates will not be bolted to the structure until after the exact final elevation of the roadway is determined. The structure shall be placed prior to placing the wearing surface. This will allow for minor adjustments to the final grade of the structures. All brick portions shall be parged with a minimum of ½" of mortar.
- W. All existing grates, castings, and hoods removed shall remain the property of the Municipality and will be delivered to the Public Works Department.

3.5 CONCRETE PLACEMENT

- A. Place cast-in-place concrete according to ACI 318/318R.

3.6 CONNECTIONS TO EXISTING FACILITIES

- A. The Contractor shall make all required connections of the proposed drainage facilities into existing drainage facilities, where and as shown on the Location Maps, including implementing modifications to the storm water management and erosion control facilities on the site.
- B. Connections made into existing drainage facilities shall be performed in accordance with the requirements of the Owner of the facility. The Contractor will be required to comply with all such requirements. The cost of making the connections in accordance with the requirements of the Owner of the existing facility shall be included in the Contract Unit Price for the pipe.

3.7 UNDERDRAINS

- A. General Requirements: Remove and replace underdrains as required.
- B. Pipe Installation: Underdrain pipe of the type and size specified shall be embedded firmly on a minimum of two (2) inches of AASHTO #57 limestone to the line and grade of the existing underdrain. Unless otherwise specified, perforated pipe shall be laid with the perforations down and the pipe sections shall be joined securely with the appropriate fittings or bands. Upgraded ends of pipe underdrains shall be closed with suitable plugs.
- C. Backfill requirements must be in accordance with the Construction Plan.
- D. Pipe Connections and Changes in Alignment: Pipe to pipe connections and changes in the pipe alignment shall be made only with prefabricated fittings to be supplied by the manufacturer of the pipe (e.g. tees, wye branches, etc.).
- E. Connection to Manholes, Catch Basins or Stormwater Inlets: The Contractor shall connect all underdrains through the walls of the nearest manhole, catch basin or stormwater inlet to ensure

proper drainage. If no structure is near the location of the proposed outlet, the Contractor shall outlet the underdrain in an area that will not disturb or damage property.

3.8 DRAINAGE SYSTEM INSTALLATION

- A. Assemble and install components according to manufacturer's written instructions and as shown on the details.

3.9 CLEANING AND REPAIR

- A. Clean interior of piping of dirt and superfluous materials by flushing with potable water.
- B. The Contractor will be required to clean the entire drainage system of all debris and obstructions. This shall include, but not be limited to, removal of all formwork from structures, concrete and mortar droppings, construction debris and dirt. The system shall be thoroughly flushed clean, and the Contractor shall furnish all necessary hose, pumps, pipe and other equipment that may be required for this purpose. No debris shall be flushed into existing storm drains or streams; all debris shall be removed from the system.
- C. After the system has been cleaned, the Contractor shall thoroughly inspect the system and all repairs shown to be necessary shall be promptly made by the Contractor.
- D. All work of cleaning and repair as specified herein shall be performed at the Contractor's expense.

3.10 FINAL INSPECTION

- A. Upon completion of the Work and before final acceptance by the Owner, the entire drainage system shall be subject to a final inspection in the presence of the Engineer and the Owner's Representative. The Work shall not be considered as complete until all requirements for line, grade, cleanliness, and workmanship have been completed to the satisfaction of the Owner's Representative and the Engineer.

END OF SECTION 02630

SECTION 02741 – HOT MIX ASPHALT PAVING**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 this Section.

1.2 SUMMARY

- A. This Section includes the following:

1. Hot mix asphalt paving
2. Stone base

1.3 DEFINITIONS**1.4 Hot-Mix Bituminous Paving Terminology:** Refer to ASTM D 8 for definitions of terms.

- A. Hot Mix Asphalt Paving: Bituminous paving or material
- B. PennDOT: Pennsylvania Department of Transportation.

1.5 SUBMITTALS

- A. Job-Mix Designs and Certifications:

1. PennDOT certification and job mix formulas from the supplier for the bituminous materials for the proposed Work seven (7) days prior to the pre-construction conference.
2. PennDOT Form TR 465 must be supplied each day the bituminous material is delivered to the job.
3. PennDOT Form CS-4171 (Certificate of Compliance) and Form TR-448A (Job Mix Formula Report) being computer print outs for the weight of aggregate and asphalt cement content along with accumulated total tonnage listed and the temperature of the mix leaving the plant must be submitted daily.
4. Material Supplier's Bill of Lading indicating the temperature of the material leaving the plant, the type of material, the net weight of material in the truck and the cumulative total tonnage of material being installed must be submitted daily.
5. Tack Coat: PennDOT certification and source of material must be submitted seven (7) days prior to the pre-construction meeting. Material Supplier's Bill of Lading must be submitted daily.

6. Seal Coat: PennDOT certification and source of material must be submitted seven (7) days prior to the pre-construction meeting. Material Supplier's Bill of Lading must be submitted daily.
- B. Qualification Data: PennDOT pre-qualification certifications from all Contractors and Suppliers meeting the appropriate classifications for the project and a minimum of three references for previous projects completed.
- C. Material Test Reports: For each bituminous paving material by a company qualified and certified by PennDOT to complete the tests required by this specification.
- D. Material Certificates: For each paving fabric, signed by manufacturers.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: The qualified manufacturer shall be certified by PennDOT
- B. Testing Agency Qualifications: The agency shall be certified by PennDOT or NECEPT
- C. Regulatory Requirements: Comply with current edition of Publication 408 as prepared by PennDOT
- D. Pre-construction Conference:
 1. Review proposed sources of paving materials, including capabilities and location of the plant that will manufacture bituminous materials.
 2. Review condition of subgrade and preparatory work.
 3. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
 4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver geotextile materials to the Project site in original packaging with the manufacturer's labels containing the brand name and type of material. Store geotextile materials and other paving fabrics in accordance with Section 735 in the current edition of PennDOT's Publication 408.
- B. The temperature of the hot-mix asphalt paving mix being delivered shall not be more than fifteen (15) degrees below the minimum temperature shown on the material supplier's Bill of Lading and not above the maximum specified temperature.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply bituminous materials, geotextiles or paving fabrics unless the following requirements are met:

1. The sub-base or existing bituminous material is dry as determined by the Owner's representative.
2. The existing pavement has been cleaned in accordance with Section 401 of the current edition of PennDOT's Publication 408
3. Tack Coat: Minimum air and surface temperature of 40 degrees F and rising in accordance with Section 460 in the current edition of PennDOT's Publication 408
4. Bituminous Base Course: Minimum surface and air temperature of 35 degrees F and rising at time of placement in accordance with Section 305 in the current edition of PennDOT's Publication 408.
5. Superpave Bituminous Binder and Wearing Surface: Minimum surface and air temperature of 40 degrees F and rising at time of placement in accordance with Section 409 in the current edition of PennDOT's Publication 408. Do not install between October 31 and April 1.
6. Bituminous Seal Coat: Minimum surface and air temperature of 60 degrees F and rising at the time of placement in accordance with Section 470 in the current edition of PennDOT's Publication 408. Do not apply between September 15 and May 1.
7. The temperature of the asphalt rejuvenating emulsion at the time of application shall be as recommended by the manufacturer. The asphalt rejuvenating agent shall be applied only when the existing surface to be treated is thoroughly dry and when it is not threatening to rain. The asphalt rejuvenating agent shall not be applied when the ambient temperature is below 40 degrees Fahrenheit.

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. Coarse Aggregate: Shall conform to the requirements in Sections 401 and 703 in the current edition of PennDOT's Publication 408.
- B. Fine Aggregate: Shall conform to the requirements in Sections 401 and 703 in the current edition of PennDOT's Publication 408.

2.2 ASPHALT PAVING MATERIALS

- A. Asphalt Cement: Shall conform to the requirements in Section 702 in the current edition of PennDOT's Publication 408 for AASHTO MP1, PG 64-22.
- B. Tack Coat: Shall conform to the requirements in Section 460 in the current edition of PennDOT's Publication 408 for emulsified asphalt, Class AE-T.
- C. Superpave Base, Binder and Wearing Surface: Superpave Asphalt Mixture Design, PG64-22, 0 to 0.3 million ESAL's, 9.5, 9.5 fine, 19- & 25-mm mix complying with the requirements in Section 409 in the current edition of PennDOT's Publication 408. The bituminous wearing surface shall incorporate coarse aggregate having a Skid Resistance Level (SRL) designation of "H" or better, supplied from sources approved for this classification as defined and listed in PennDOT's Bulletin No. 14.

- D. Joint Sealant: Shall conform to the requirements for AET emulsified asphalt in Section 401 in the current edition of PennDOT's Publication 408.

2.3 AUXILIARY MATERIALS

- A. Sub-grade Stabilization Geotextile: Shall conform to the requirements in Section 735 in the current edition of PennDOT's Publication 408 for non-woven, Class 4 geotextile.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that sub-base & existing bituminous paving is dry and in suitable condition to support paving and imposed loads.
- B. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 REPAIRS

- A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt wearing surface course to level sags and fill depressions in existing pavements.
- B. Crack and Joint Filling: Complete in accordance with the specifications of Section 469 of PennDOT Publication 408.

3.3 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared sub-grade and all existing bituminous material are ready to receive paving.
1. Clean existing pavement surface of loose and deleterious material immediately before installing any bituminous material or paving fabric. Cleaning shall be completed with a power broom or mechanical sweepers capable of collecting the material and disposing of it offsite. If, in the opinion of the Owner's Representative, the cleaning is not adequate, the Contractor shall repeat the procedure until it is deemed satisfactory.
 2. All joints in existing concrete pavements and all larger cracks in bituminous pavement (1/2" wide or larger) shall be thoroughly cleaned to a depth of one (1) inch and replaced with a sand and asphalt grout.
 3. The existing pavement surface shall be brought to a uniform grade and cross section where and as specified. The surface of the existing pavement shall be brought to the same transverse slope and longitudinal cross section as the finished pavement section using scratch coat of bituminous wearing at a variable thickness.

- B. Tack Coat: Apply in accordance with the specifications in Section 460 of PennDOT Publication 408, not exceeding 0.02 gallon per square yard variation.
1. The tack coat shall be applied at the specified rate and uniform manner of 0.02 to 0.07 gallon per square yard at a surface temperature of 40 degrees and rising.
 2. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 3. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
 4. The tack coat shall be applied to all paving areas of the cartway, driveway edges, catch basins, inlets, manholes, curbs and utility boxes.
- C. After the subgrade and/or existing pavement surfaces have been prepared as specified herein, the Contractor shall check all frames, covers, grates, water valve boxes and all other miscellaneous castings that are in the proposed pavement area to ensure that all such items have been accurately positioned and set to the proper slope and elevation. All covers and grates are to be set flush with the required finished pavement surface. No depressions or mounds will be permitted on the pavement to accommodate inaccuracies in the setting of these appurtenances. All corrective work that may be necessary shall be performed at the Contractor's expense.
- D. Where new pavements are to meet existing pavements (except as specified herein under Bituminous Concrete Overlays), the Contractor shall line cut the existing pavements with approved pneumatic, saw cutting or mechanical cutting tools so that there will be a vertical butting surface between the old and new pavements. There shall be a one (1) foot offset in each pavement course to permit each successive course to overlap the lower existing course. Line cutting of existing pavements shall be along neat, straight and even lines, and shall be performed in such a manner so as not to damage the adjacent pavement to remain. The Owner's Representative shall approve the acceptability of the line cutting device and the method of operation, and his decision shall be final.
- E. All vertical surfaces of curbs, structures, gutters, and existing pavement in contact with new bituminous mixtures shall be painted with a uniform coating of an approved bituminous emulsion or priming material. Extreme care shall be exercised in the application of this material to prevent splattering or staining of surfaces that are to remain exposed. Work that is stained because of the Contractor's operations shall be repaired and/or replaced at the Contractor's expense.

3.4 GEOTEXTILE INSTALLATION

- A. The Contractor shall be required to install Class 4 geotextile fabric on the subgrade prior to installing the bituminous pavement in soft spot areas.
1. The Contractor shall install the Class 4 geotextile fabric in accordance with the requirements set forth in Section 212 in the current edition of the Pennsylvania Department of Transportation's Publication 408. The maximum overlap between rolls is twelve (12) inches with no additional compensation for the cost of the overlapping or pins required for installation.
 2. The geotextile shall be pinned to the sub-base using eight (8) penny aluminum nails spaced twelve (12) inches center to center.

3. Trucks shall not be permitted to travel over the fabric when aggregate is being installed. The aggregate shall be placed on the fabric by dumping the trucks and then blading the aggregate onto the fabric with a front loader. The aggregate must be dropped onto the fabric and not shoved over it.

3.5 HOT MIX ASPHALT PAVING EQUIPMENT

- A. Paver: Shall conform to Section 401.3 in the current edition of PennDOT's Publication 408 and the following.
 1. Self-contained, power-propelled units, with activated screeds or strike-off assemblies that produce a finished surface of required evenness and texture must be used. A unit must be provided that does not tear, shave or gouge the mixture. It must be heated and capable of spreading and finishing a bituminous plant mix.
 2. A paver must be capable of being operated at forward speeds consistent with satisfactory laying of the mixture, equipped with receiving hoppers having sufficient capacity for uniform spreading and with distribution systems that place the mixture uniformly in front of the screeds.
 3. Hydraulic or other type extensions may be used against abutting lanes or longitudinal joints if the extension is fed and activated by the same method as the main screed. A non-activated extension may not be used. The width of the screed shall be such as to cover a total width of twenty-four (24) feet in two passes.
- B. Distributors: Shall conform to Section 460.3 (b) in the current edition of PennDOT's Publication 408.
- C. Bituminous Rollers: Shall conform to Section 108.05(c)3 in the current edition of PennDOT's Publication 408.
- D. Trucks: The trucks used to transport the hot mix bituminous material to job site shall conform to Section 401.0(c) in the current edition of PennDOT's Publication 408.

3.6 HOT-MIX ASPHALT MATERIAL INSTALLATION

- A. Machine shall place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place bituminous paving mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to the required grade, cross section, and thickness when compacted.
 1. Place the 9.5 mm Superpave Wearing Course - 2 inches in compacted depth.
- B. Place the bituminous paving material in accordance with the construction detail
- C. Install the bituminous materials in accordance with the following:
 1. All hot mix asphalt materials shall be installed in accordance with the current edition of PennDOT's Publication 408.

2. Do not place bituminous paving when the surface is wet or when its air or surface temperature is less than 40 degrees Fahrenheit.
3. No hot mix asphalt material shall be installed if the temperature of the material is less than 275 degrees Fahrenheit or greater than 325 degrees Fahrenheit. All temperatures must be shown on the Bill of Lading. If this specification is not met, the bituminous material shall be rejected and ordered off the job site.
4. Any bituminous material that has reached a temperature less than 225 degrees Fahrenheit before initial rolling shall be removed and replaced at no expense to the Owner.
5. When installing hot mix asphalt material, the adjacent lanes shall be pulled evenly during a day's worth of paving. If this is not possible, the maximum difference in length between lanes installed for one day's work shall be twenty-five (25) feet.
6. All trucks delivering asphalt are to remain covered/tarped until ready to dump asphalt into the paving machine or they are empty. Any truck with an uncovered partial load waiting for unloading shall not be permitted to dump its load into the paver.
7. No traffic shall be permitted on newly compacted hot mix asphalt material until its temperature is lower than 140 degrees F. This requirement will be strictly enforced.
8. No kerosene is to be used on the paving equipment.
9. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.
10. Bituminous tack coat shall be applied in accordance with Section 460 of PennDOT Pub. 408 to all bituminous base and binder courses when, in the opinion of the Engineer, the surface is not satisfactory for direct placement of paving.
11. The edge of the overlay shall be sealed with a hot bituminous seal approximately twelve (12) inches wide with six (6) inches on the overlay and six inches on the existing pavement.
12. A 12" pass of PG 64-22 should be placed along the concrete curbs and the gutter section of the curbs. When sealing past driveways, the gutter line must be sanded to prevent tracking.

3.7 9.5mm SUPERPAVE BITUMINOUS WEARING SURFACE

- A. The above items shall meet the PennDOT specifications for the designated ESAL's as indicated for the items on the proposal pages for bidding of the project. The bituminous wearing surface shall consist of 1 ½" compacted 9.5 mm Superpave bituminous wearing surface. The asphalt cement used in the mix design shall be PG 64-22. The air and surface temperature for the placement of the 9.5 mm Superpave bituminous wearing surface must be 40°F and rising. No exceptions will be made.
- B. The aggregate for all the bituminous wearing surface and binder course shall be either slag, crushed gravel or crushed limestone. All aggregates used for the bituminous asphalt must be the SRL designation as indicated on the proposal pages for bidding of the project.
- C. The Engineer has the right to require the wearing surface be cored prior to final payment. Cost of coring should be considered incidental to the wearing surface item.

3.8 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions with the same texture and smoothness as other sections of the hot-mix asphalt course.
 1. Clean contact surfaces and apply tack coat to joints.
 2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
 3. Offset transverse joints, in successive courses, a minimum of 24 inches.
 4. Construct transverse and longitudinal joints as per PennDOT Publication 408.
- B. Install Joint Sealant in accordance with the following:
 1. All edges of the new pavement, including around inlet, manhole and utility box castings shall be sealed with a bituminous sealant, PG 64-22 or approved equal.
 2. On pavements with bituminous wedge curbs, apply PG 64-22 or approved equal applied twelve (12) inches wide, four (4) inches of which shall be applied to the wedge curb.
 3. On pavements with concrete curbs, apply PG 64-22 or approved equal twelve (12) inches wide, four (4) inches of which shall be applied to the curb.
 4. Sanding at driveways and sidewalks.

3.9 COMPACTION

- A. Complete compaction as per the specifications in Section 401 in the current edition of PennDOT Publication 408.
- B. Compact hot mix asphalt paving with hot, hand tampers or vibratory compactors in areas inaccessible to rollers.
- C. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace them with fresh, hot-mix asphalt. Compact by rolling to the specified density and surface smoothness.
- D. Erect barricades to protect paving from traffic until the mixture has cooled enough not to become marked.

3.10 INSTALLATION TOLERANCES

- A. Thickness: In accordance with Section 401 in the current edition of PennDOT Publication 408.
- B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
 1. Base Course and Binder: 1/4 inch
 2. Wearing Surface: 1/8 inch

- C. Crowned Surfaces: Test using appropriate methods and procedures acceptable to the Owner's Representative to ensure the required crown cross section is obtained.

3.11 FIELD QUALITY CONTROL

- A. Prior to the installation of the wearing surface, the Contractor shall be required to core the binder material which was placed. The number of cores taken on each road should be at the discretion of the engineer and will be at a minimum of two per roadway. The location of the cores will be determined by the engineer after the binder has been placed. Results from the cores taken should be submitted to the engineer for review prior to installation of the wearing surface. The Contractor must leave ample time for the Engineer to review the submitted information. There shall be no claim for additional compensation due to the delay with the coring requirement. Payment for cores should be incidental to the Binder item.
- B. The Engineer has the right to require the wearing surface be cored prior to final payment. Cost of coring should be considered incidental to the wearing surface item.
- C. Hot Mix Asphalt Pavement: The testing agency shall conduct compaction and depth tests as follows:
1. The Contractor shall be required to provide tests for density for all layers of bituminous material by following the requirements set for in Section 409.9b HMA in the current edition of PennDOT Publication 408 for nuclear gage testing. The test shall be performed by a licensed nuclear gage operator as witnessed by the Engineer or Owner's Representative utilizing the following procedure set forth in Section 409 in the current edition of PennDOT Publication 408. The Contractor shall complete the following with regards to density testing:
 - a. Use a nuclear gage meeting the requirements of P.T.M. No 402.
 - b. Use a nuclear gage calibrated in accordance with AASHTO Test Method T-238-86. Submit certification of annual calibration of gages and documentation of licensed operators training to the Municipality Engineer, Project Manager or Inspector prior to the placement of any material.
 - c. Use the control strip technique specified in PTM No. 402, Section 7.2.3., to determine the optimum rolling pattern for each material course. Record all counts, and plot the rolling pattern growth curve on form TR 4276-B.
 - d. The Contractor shall submit the testing results to the Engineer or Owner's Representative daily.
 2. The Contractor will be paid for the material based on the above required testing and in accordance with the current edition of Penn DOT's Publication 408. The Engineer retains the right to verify the density testing in accordance with the above testing procedure to verify the results.

3.12 TEST FOR SURFACE IRREGULARITIES

- A. Use a template cut to the required cross section of the finished base course. Equip the template with metal or other vertical extensions attached to each end, so the bottom of the template will

be at the elevation of the top of the base course. Test the cross section for surface irregularities at intervals of not more than 25 feet.

- B. Use a 10-foot straightedge to test for longitudinal irregularities in the surface of the base course. Hold the straightedge parallel to the road centerline in contact with the surface. Move the straightedge from one side of the base course to the other. Advance along the base course in 5-foot increments.
- C. Correct all surface irregularities exceeding 1/2 inch by loosening the surface and removing or adding material as required. Compact the corrugated area and surrounding surface by rolling.
- D. Tests for Materials
 - 1. All materials used in permanent pavement construction shall be subject to testing and certifications as required by PennDOT procedures and regulations. All tests shall be performed by the Contractor, his suppliers or independent testing laboratories, at no cost to the Owner.
 - 2. Aggregate - Supplier's certifications, plus one grab sample per 10,000 tons to be tested by an independent laboratory.
 - 3. Hot Mix Asphalt Materials - Daily plant certification, plus one grab sample per day for each type of material used for an extraction test by an independent testing laboratory.

END OF SECTION 02741

SECTION 02751 - CEMENT CONCRETE PAVEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Location Maps and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes exterior cement concrete pavement for the following:
 - 1. Curbs
 - 2. Sidewalks and Driveways.
- B. Related Sections include the following:
 - 1. Division 2 Section "Earthwork" for subgrade preparation, grading, and subbase course.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.4 SUBMITTALS

- A. Product Data: For each type of manufactured material and product indicated.
- B. Design Mixtures: For each concrete pavement mixture. Include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Qualification Data: For manufacturer
- D. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:
 - 1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.
- E. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:

1. Cementitious materials.
 2. Steel reinforcement and reinforcement accessories.
 3. Fiber reinforcement.
 4. Admixtures.
 5. Curing compounds.
 6. Applied finish materials.
 7. Bonding agent or epoxy adhesive.
 8. Joint fillers.
- F. Field quality-control test reports.
- G. Minutes of pre-installation conference.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.
1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- B. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.
- C. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

1.6 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
 2. Products: Subject to compliance with requirements, provide one of the products specified.
 3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include but are not limited to, manufacturers specified.

4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
 1. Use flexible or curved forms for curves with a radius of 100 feet or less.
 2. Forms shall be of metal or new wood at least ten (10) feet long.
 3. Wood forms shall be rigid enough not to bow and deflect when concrete is placed. Worn, broken or distorted forms shall not be used.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- C. Each form shall be braced and staked in at least three (3) places for each ten (10) foot length, closer if necessary to keep from deforming when concrete is placed.

2.3 STEEL REINFORCEMENT

- A. The Contractor must submit submittals for all Steel Reinforcement

2.4 CONCRETE MATERIALS/MIXTURES

- A. Cementitious Material: Use one of the following cementitious materials, of the same type, brand, and source throughout the Project:
 1. Portland Cement: ASTM C 150, Type I, non-air Entraining Portland Cement
- B. Normal-Weight Aggregates: ASTM C 33 coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
 1. Maximum Coarse-Aggregate (1530lbs/cu. yd) must be slag for reinforced concrete pavement, concrete curb, concrete sidewalk, reinforced concrete drives and any exposed concrete in structures. Limestone aggregate may be used in place of slag only upon approval of the aggregate and design mix by the engineer. To obtain approval the aggregate mix design must be submitted two (2) weeks before contemplated use.
 2. Fine Aggregate: Type A aggregate; 1220 lbs./cu. yd.

- C. Exposed Aggregate: Selected, hard, and durable; washed; free of materials with deleterious reactivity to cement or that cause staining; from a single source, with gap-graded coarse aggregate as follows:
1. Aggregate Sizes: 3/4 to 1 inch (19 to 25 mm), 1/2-to-3/4-inch (13 to 19 mm), 3/8-to-5/8-inch (10 to 16 mm) nominal. The aggregate size shall be as directed by the Municipality.
- D. Water: ASTM C 94/C 94M or 33 gallons/cu. yd.
- E. Slump shall be 1 inch to 3 inch.
- F. Air Entraining Admixtures shall be in accordance with AASHTO Designation M-154 (ASTM C-260-01)
- G. Entrained air content shall be 6.5% with a tolerance of plus or minus 1.5%
- H. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.
1. Use a qualified independent testing agency for preparing and reporting proposed concrete mixture designs for the trial batch method

2.5 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Five alternates of curing are proposed, requiring different sealing materials. They include:
1. Seal Tight CS-309 or equal manufactured by W.R. Meadows, Inc.
 2. Seal Tight Tiah or equal manufactured by W.R. Meadows, Inc.
 3. Con-Seal or equal manufactured by Monarch Chemical Company

2.6 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber (AASHTO-M213)
- B. Sealing of Concrete joints shall be “Sikaflex-1A Elastic Sealant/Adhesive” or equal. The sealant is a one component polyurethane-base material. Color of sealant shall be limestone.

- C. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery with emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.
- D. Bonding Agent: ASTM C 1059, Type II, non-dispersible, acrylic emulsion or styrene butadiene.
- E. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to requirements, and as follows:
 - 1. Types I and II, non-load bearing or IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.7 CONCRETE MIXING

- A. No on-site mixing is permitted. All concrete must be obtained from a Certified Concrete Plant.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Proof-roll prepared subbase surface with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding.
 - 1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph.
 - 2. Proof-roll with a loaded 10-wheel tandem-axle dump truck weighing not less than 15 tons.
 - 3. Subbases with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch require correction according to requirements in Division 2 Section "Earthwork."
 - 4. Concrete curb and sidewalk subbases shall be compacted with a mechanical whacker.
- C. Proceed with concrete pavement operations only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.

3.2 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.
- B. The subgrade shall be compacted, and any soft spots removed and replaced

- C. Concrete slabs shall be a minimum of eight (8) inches thick for roadways, five (5) inches thick for driveways and four (4) inches thick for sidewalks. The aggregate bed shall be a minimum of six (6) inches thick for roadways, four (4) inches thick for driveways and four (4) inches thick for sidewalks. The aggregate bed shall be PennDOT 2A limestone.

3.3 SUB-GRADE REPAIR

- A. After the existing base has been removed to the sub-base, the Contractor and the Inspector will determine if any soft spot exists and mark the limits to be replaced. Determination of soft areas shall be made by the Project Inspector or Engineer. The area shall be excavated at this time in preparation for the pouring of the concrete.
- B. If soft spots are found, PennDOT Class IV geotextile fabric shall be placed prior to the placement of 12" of AASHTO No.1 stone choked with PennDOT Type 2A limestone. The fabric shall wrap over the top of the stone prior to the placement of the stone subbase.

3.4 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.5 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Arrange, space, and securely tie bars and bars support to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
- E. The concrete driveway shall be reinforced with No. 9, 6" x 6", gauge wire mesh with a minimum cover of two (2) inches.
- F. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap of adjacent mats.

- G. The concrete slabs shall be constructed as per as per PennDOT Publication 408 and the Municipality of Mt. Lebanon's details.

3.6 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
- B. All joints in new concrete shall be sealed including the joints in straight and rolled curbs, sidewalks, driveway and other concrete structures. The joints between old and new concrete must also be sealed.
- C. Contraction joints in the reinforced concrete pavement and/or base shall be constructed by sawing with a special concrete saw using one or more circular blades, cooled and lubricated with water.
- D. Expansion joints in reinforced concrete pavement and/or base shall be constructed with slip dowels, and minimum 3/4" thick expansion joint filler as detailed. A steel plate, slip dowels and minimum 3/4" joint filler can be used as an alternate. Spacing shall be at all points of curve, points of tangent and at street intersections. All expansion joints shall be sealed with "Sikaflex-1A" as soon as possible after construction of the joint, as well as joints between new and old concrete.
- E. Contraction joints in concrete curbs shall be made every ten (10) feet and a contraction joint shall be in line with each contraction joint in the sidewalk if one abuts said curb. They shall not exceed 1/4" in thickness and shall be formed with steel plates and mastic 1/8" in thickness. Expansion joints 1/2" thick, shall be formed at not more than 20-foot intervals.
- F. Contraction joints in concrete sidewalks shall be spaced at a minimum of five (5) foot intervals and formed with a device to have the completed joint at least 1.25" inch deep. Expansion joints shall be spaced no more than twenty (20) feet apart and formed with 1/4-inch pre-molded filler to the full depth of the slab. The 1/4-inch pre-molded filler shall also be placed adjacent to curbs, other sidewalks, buildings or pavements. If the sidewalk abuts a curb the joints on the sidewalk shall match the joints in the curb.
- G. Contraction joints in concrete driveways shall be spaced at a maximum of ten (10) foot intervals and formed with a device to have the completed joint at least 1.25" deep. Expansion joints shall be spaced no more than twenty (20) feet apart and formed with 1/4" thick pre-molded filler to the full depth of the slab. The 1/4" pre-molded filler shall also be placed adjacent to curbs, sidewalks, other driveways, buildings or pavements. If the driveway abuts a curb the joints on the driveway shall match the joints in the curb.
- H. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.

- I. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
 1. Locate expansion joints at intervals of 20 feet unless otherwise indicated.
 2. Extend joint fillers full width and depth of joint.
 3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
 4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
 5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
 6. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
- J. On any tooled joints or edges of concrete do not use the jointing or edging tool until the surface water has evaporated from the concrete (sheen disappears). Bull float and broom the surface, then finish the joint and edges and use broom to remove the tool marks on the surface.

3.7 SEALING OF CONCRETE JOINTS

- A. All joints, both expansion and joints against structures, must be sealed.
- B. The sealant shall be "Sikaflex-1A Elastic Sealant/adhesive" or equal. The sealant is a one component polyurethane-base material. Color of sealant shall be selected from the standard colors that the manufacturer produces. The color shall match the finished color of the concrete. Refer to manufacturer's specifications for more details. This sealant should be used only for sidewalks and driveways.
- C. The sealant for roadways shall be PG 64-22.
- D. Apply Sikaflex-1A at a temperature between forty (40) degrees Fahrenheit and one hundred (100) degrees Fahrenheit with a gun and using the twenty (20) ounce sausage. The joint slot should be at mid-point of its expansion and contraction. The joint should be tooled slightly concave and approximately one eighth (1/8) inch below the concrete surface. The pointing tool should be wet with a soap solution.

3.8 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.

- C. No concrete shall be placed prior to April 15th or after December 1st in any year except with special permission of the Engineer and then only if the contractor is prepared to comply with the cold weather requirements as specified in PennDOT Specifications Form 408.
- D. When the air temperature may be expected to drop below forty (40) degrees Fahrenheit at any time during the day or night of the 24 hours following the placing of concrete, there will be required, in addition to covers, three (3) bales of straw hay, weighing approximately 100 pounds, shall be spread for each thirty five (35) square yards of concrete and then covered with a tarpaulin. The concrete shall be maintained at a temperature of not less than fifty (50) degrees Fahrenheit and not more than eighty (80) degrees Fahrenheit for the first proper temperatures. Gradually lower the temperature to the surrounding area for at least three (3) additional days.
- E. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- F. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.
- G. Do not add water to concrete during delivery or at Project site.
- H. Do not add water to fresh concrete after testing.
- I. Concrete sidewalk shall be a minimum of four (4) inches thick and to a width equal to the existing sidewalk or as specified. The aggregate bed shall be four (4) inches in depth and to a width of the sidewalk or as specified. The aggregate bed shall be PennDOT 2A limestone.
- J. No private, public or contractor vehicles and/or equipment shall be placed or moved on the concrete pavement until twenty-eight (28) days have elapsed from time of pour, and then only when earth shoulders are placed against the pavement edges. Opening to traffic shall not constitute a final acceptance of pavement from centerline. The pavement thickness may be modified if so, specified in the proposal. The Contractor must provide breaks at 7, 14, and 28 days from the date of the pour to determine the strength.
- K. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- L. The concrete shall be placed in forms in horizontal layers not to exceed five (5) inches and vibrated sufficiently to eliminate all voids.
- M. Concrete shall be poured from the lower elevation to the higher elevation of the proposed road, in an ascending grade.
- N. Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed.
 - 1. Remove and replace concrete that has been placed for more than 15 minutes without being covered by top layer or use bonding agent if approved by Engineer.

- O. The crown in any pavement or base shall be measured from the high side edge where one edge is higher than the other except where otherwise noted.
- P. Screed pavement surfaces with a straightedge and strike off.
- Q. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- R. Curbs and Gutters: When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to require cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not approved, remove and replace with formed concrete.
- S. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixed designs.
- T. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:
 - 1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 - 3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.9 CONCRETE SIDEWALKS

- A. Under this item, the contractor shall be required to replace concrete sidewalks damaged during work on this contract. All concrete sidewalks within the Public Right of Way affected by sanitary repair activities shall be replaced with thirteen (13) inches of AASHTO #57 limestone to act as the base. The concrete surface shall consist of four (4) inches of Class AA Concrete, air entrained, 3,500 PSI at 28 days. The concrete finish shall meet existing conditions.
- B. Forms shall be of metal or new wood at least ten (10) feet long. Each form shall be braced and staked in at least three (3) places for each ten (10) foot length and closer if necessary to keep from deforming when concrete is placed. They shall be thoroughly cleaned and coated with

non-staining oil. Wood forms shall be rigid enough not to bow and deflect when concrete is placed. Worn, broken or distorted forms shall not be used.

- C. The sidewalks proposed to be disturbed due to a point repair, manhole installation, etc. shall be saw cut prior to excavation. Saw cutting shall be included in the price of the sidewalk restoration and no additional compensation will be provided for the saw cutting.
- D. Contraction joints shall be spaced at a minimum of five (5) foot intervals and formed with a device to have the completed joint at least 1/2 inch deep. Expansion joints shall be spaced no more than thirty (30) feet apart and formed with 1/4-inch pre-molded filler to the full depth of the slab. The 1/4-inch pre-molded filler shall also be placed adjacent to curbs, other sidewalks, buildings or pavement. If the sidewalk abuts a curb the joints on the sidewalk shall match the joints in the curb.
- E. The surface of the slab shall be brought to a uniform plane surface by means of a wood screed riding on forms. The surface shall then be finished with a wood or magnesium float and fine broom finished. The tool marks for joints and edges shall match the marks in the existing walk. Neither dry cement nor water shall be added to the surface during the finishing process.
- F. On any tooled joints or edges of concrete do not use the jointing or edging tool until the surface water has evaporated from the concrete (sheen disappears). Bull float and broom the surface, then finish the joint and edges and use broom to remove the tool marks on the surface.
- G. After curing, the concrete shall be treated with a two-coat application of boiled linseed oil diluted with mineral spirits. The linseed oil shall meet the specifications of ASTM D-260 Type 1. The temperature for the application to the concrete surface must be 40°F and rising.
- H. The concrete shall be thoroughly vibrated to eliminate voids within the placed concrete.
- I. Sealing of Joints
 - 1. All joints, both expansion and joints against structures, must be sealed.
 - 2. The sealant shall be "Sikaflex-1A Elastic Sealant/adhesive" or equal. The sealant is a one component polyurethane-base material. Color of sealant shall be selected from the standard colors that the manufacturer produces. The color shall match the finished color of the concrete. Refer to manufacturer's specifications for more details.
 - 3. All joints must be sound, clean, dry and free from oil and grease. Curing compound residues and any foreign material must be thoroughly removed. The joint walls must be primed with Sikaflex Primer 429 with a single uniform coat by brush. The primer should dry forty-five (45) minutes to one hour. Sikaflex-1A must be installed within eight (8) hours of priming, if not, reprime the joint.
 - 4. Apply Sikaflex-1A at a temperature between forty (40) degrees Fahrenheit and one hundred (100) degrees Fahrenheit with a gun and using the twenty (20) ounce sausage. The joint slot should be at the mid-point of its expansion and contraction.
- J. Insulated protection of the concrete shall be required dependent on the weather conditions at the time of pouring and during the curing period. A vis-quene cover shall be considered the

minimum protection for the concrete during adverse weather conditions. Whether the concrete requires a vis-quene cover or blankets shall be reserved solely for the Municipality or its authorized representative.

- K. If any rain conductors exist underneath the sidewalk, they shall be replaced in kind and a piece of No. 9 gauge wire mesh reinforcing one (1) foot wide shall be placed over them for reinforcement. Also, a construction joint shall be placed over the rain conductor location. No additional compensation will be provided for the restoration of roof/driveway drains under the sidewalk.
- L. If any gas valve, water valve, sewer vents, or other utility valves boxes are encountered during the restoration of the sidewalk, they shall be restored to the finished grade of the sidewalk. No additional compensation will be given for working around valve boxes, etc. encountered within the limits of sidewalk work.

3.10 CONCRETE STRAIGHT CURB RESTORATION

- A. Concrete curb be placed in kind and in accordance with the concrete straight curb detail provided. The curb shall be constructed of Class AA air entrained ready mixed 3,500 PSI 28-day compression strength concrete.
- B. The curbs proposed to be disturbed due to a point repair, manhole installation, etc. shall be saw cut prior to excavation. Saw cutting shall be included in the price of the curb restoration and no additional compensation will be provided for the saw cutting.
- C. Forms shall be of metal or new wood at least ten (10) feet long. Each form shall be braced and staked in at least three (3) places for each ten (10) foot length and closer if necessary to keep from deforming when concrete is placed. They shall be thoroughly cleaned and coated with non-staining oil. Wood forms shall be rigid enough not to bow and deflect when concrete is placed. Worn, broken or distorted forms shall not be used.
- D. Effort shall be made to minimize damage to curbs.
- E. The contractor will be responsible for providing a minimum of 12" of AASHTO #57 limestone for a suitable base for the curb in accordance with the detail.
- F. A 2-ply tar paper must be placed between the AASHTO base and the concrete curb.
- G. Contraction joints must be placed at ten (10) feet in the center.
- H. Expansion joints shall be spaced no more than thirty (30) feet apart and formed with 1/4-inch pre-molded filler to the full depth of the slab. The 1/4-inch pre-molded filler shall also be placed adjacent to curbs, other sidewalks, buildings or pavement. If the curb abuts a sidewalk the joints on the curb shall match the joints in the sidewalk.
- I. A 4" diameter ADS slotted underdrain must be placed behind the curbing in accordance with the detail.
- J. The concrete shall be thoroughly vibrated to eliminate voids within the placed concrete.

- K. The finish on the concrete shall match the finish of the existing curb.
 - L. Sealing of Joints
 - 1. All joints, both expansion and joints against structures, must be sealed.
 - 2. The sealant shall be "Sikaflex-1A Elastic Sealant/adhesive" or equal. The sealant is a one component polyurethane-base material. Color of sealant shall be selected from the standard colors that the manufacturer produces. The color shall match the finished color of the concrete. Refer to manufacturer's specifications for more details.
 - 3. All joints must be sound, clean, dry and free from oil and grease. Curing compound residues and any foreign material must be thoroughly removed. The joint walls must be primed with Sikaflex Primer 429 with a single uniform coat by brush. The primer should dry forty-five (45) minutes to one hour. Sikaflex-1A must be installed within eight (8) hours of priming, if not, reprime the joint.
 - 4. Apply Sikaflex-1A at a temperature between forty (40) degrees Fahrenheit and one hundred (100) degrees Fahrenheit with a gun and using the twenty (20) ounce sausage. The joint slot should be at the mid-point of its expansion and contraction.
 - M. After curing, the concrete shall be treated with a two-coat application of boiled linseed oil diluted with mineral spirits. The linseed oil shall meet the specifications of ASTM D-260 Type 1. The temperature for the application to the concrete surface must be 40EF and rising
 - N. If any rain conductors exist through the curb, they shall be replaced in kind. No additional compensation will be provided for the restoration of roof/driveway drains through the curb.
 - O. Insulated protection of the concrete shall be required dependent on the weather conditions at the time of pouring and during the curing period. A vis-quene cover shall be considered the minimum protection for the concrete during adverse weather conditions. Whether the concrete requires a vis-quene cover or blankets shall be reserved solely for the Municipality or its authorized representative.
- 3.11 HANDICAP RAMPS
- A. The above ramps shall be constructed in accordance with the details provided.
 - B. Handicap ramps will be installed at all locations called for in the plan provided.
 - C. The concrete for the curbs shall be Class AA concrete, air-entrained ready mixed 3750 psi, twenty-eight-day compression strength.
 - D. All handicap ramps should be installed and reinforced in accordance with PennDOT Publication 408 requirements and details.

- E. After curing, the concrete shall be treated with a two-coat application of Sonocrete Kure-N-Seal 30 or approved equal. The temperature for the application to the concrete surface must be 40°F and rising.
- F. Expansion joints shall be provided at all inlets, the start and end of all new curbs, and between pours. All expansion joints shall be sealed with "Sikaflex 1A Elastic Sealant Adhesive or equal." (See sealing of concrete joints in this section).

3.12 CONCRETE ENCASEMENT FOR UTILITIES

- A. Under this item the Contractor shall be required, if necessary, as approved by the Municipality or its authorized representative to install concrete encasement around utility lines that are exposed within twelve (12) inches of an open cut sanitary sewer repair.
- B. The installation of concrete encasement shall be completed with an eight (8) inch minimum bed of air entrained, high early strength concrete. The concrete must then extend up the sides of the utility line and be poured to a minimum depth of at least eight (8) inches above the utility line with the required reinforcement.
- C. The concrete must be allowed to cure for a minimum of 24 hours prior to backfilling. The Engineer reserves the right to extend the curing period until the concrete has been cured sufficiently so that the encasement does not become damaged during backfilling. The curing period may vary depending on weather conditions.
- D. The Contractor shall use caution during backfilling to prevent damage to the concrete encasement.
- E. The Contractor shall be required to take all necessary precautions per PennDOT Publication 408 for curing concrete in hot/cold weather.
- F. The Contractor shall be required to install 4 - #4 steel reinforcement bars in both directions. Therefore, the encasement shall include a minimum of 8 - #4 rebar. Vertical bars shall be located on 12" centers along the entire length of the encasement. All rebar shall be tied with steel ties suitable for this type of construction.

3.13 CONCRETE ANCHORS FOR SANITARY SEWERS

- A. Under this item the Contractor shall be required, as directed by the Engineer, to install concrete anchors during sanitary sewer installation.
- B. If sanitary sewer repairs are required on slopes 20% or greater, then concrete anchors shall be installed. The concrete anchors shall be spaced at various distances depending on the slope of the sewer. Anchors shall be spaced as follows:

20-34% slope: 36' center-center
34-50% slope: 24' center-center
50%+ slope: 16' center-center

- C. High early strength air-entrained concrete shall be used for the concrete anchors. The anchors must be allowed to cure for a minimum of 8 hours prior to backfilling. The Engineer reserves the right to extend the curing period until the concrete has cured sufficiently so that the anchor does not become damaged during backfilling. The curing period may vary depending on weather conditions. The Contractor shall use caution during backfilling to prevent damage to the anchors.
- D. **The Contractor cannot backfill the pipe for a minimum of 8 hours and caution must be used once backfilling begins.**
- E. The Contractor shall be required to install the necessary forms to install the concrete anchors. Forms shall be placed on the upstream and downstream side of the anchors. The remaining edges of the anchors shall be poured wild. Wooden forms shall be removed prior to backfilling.
- F. The Contractor shall be required to install 4 - #4 rebar reinforcement bars in both directions. Each anchor will contain 8 - #4 rebar. Vertical bars shall be located 6" from the outside of the sewer pipe. All rebar shall be tied with steel ties suitable for this type of construction.
- G. The Contractor shall be required to take all necessary precautions per PennDOT Publication 408 for curing concrete in hot/cold weather.

3.14 FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared, and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
 - 1. Stiff Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.
- C. The surface of concrete sidewalks shall be brought to a uniform plane surface by means of a wood screed riding on forms. The surface shall then be finished with a wood or magnesium float and fine broom finished. The tool marks for joints and edges shall match the marks in the existing walk. Neither dry cement nor water shall be added to the surface during the finishing process.
- D. The portion of the curb to be exposed to the elements shall be finished smooth with a wood or magnesium float. All minor defects shall be filled with cement mortar. No water brush finish or plastering of the curb will be permitted. All joints and exposed edges shall be tooled to a radius of 1/4" but no tool marks will be permitted to show on the finished curb. Final finish shall be made with a coarse hairbrush.
- E. The surface of the concrete driveway slab shall be brought to a uniform plane surface by means of a wood screed riding on forms. The surface shall then be finished with a wood or magnesium

float and fine broom finished. The tool marks for joints and edges shall match the marks in the existing driveway. Neither dry cement nor water shall be added to the surface during the finishing process.

- F. On any tooled joints or edges of concrete do not use the jointing or edging tool until the surface water has evaporated from the concrete (sheen disappears). Bull float and broom the surface, then finish the joint and edges and use broom to remove the tool marks on the surface.

3.15 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.
- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching $0.2 \text{ lb/sq. ft.} \times \text{h}$ ($1 \text{ kg/sq. m} \times \text{h}$) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

3.16 PAVEMENT TOLERANCES

- A. Comply with tolerances of ACI 117 and as follows:
 1. Elevation: 1/4 inch (6 mm).
 2. Thickness: Plus 3/8 inch (10 mm), minus 1/4 inch (6 mm).
 3. Surface: Gap below 10-foot- (3-m-) long, unleveled straightedge not to exceed 1/4 inch (6 mm).
 4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch (25 mm).
 5. Vertical Alignment of Tie Bars and Dowels: 1/4 inch (6 mm).
 6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2 inch (13 mm).
 7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches (6 mm per 300 mm).
 8. Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus.
 9. Joint Width: Plus 1/8 inch (3 mm), no minus.

3.17 BACKFILLING

- A. The contractor shall not backfill against walks, driveways, curbs, etc. until concrete forms have been removed, concrete cured, and authorization has been given by the Engineer. All debris, etc. shall be removed from top to bottom of all excavations prior to all backfilling operations. In lawn or ground covers areas, backfilling shall be done with clean earth placed in six (6) inch compacted layers.

3.18 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.
- B. Drill test cores, where directed by Engineer, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy adhesive.
- C. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 02751

SECTION 02920 – SITE RESTORATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Location Maps and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

1. Seeding.
2. Sodding.
3. Lawn renovation.

1.3 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of topsoil.
- B. Manufactured Soil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil.
- C. Nursery: A company specializing in growing and cultivating the plants specified in this section. The company shall have a minimum of five (5) years of documented experience.
- D. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.
- E. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath topsoil.
- F. Weeds: Includes Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Weed, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel and Brome Grass.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1.5 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies, Fertilizer Law of Pennsylvania of 1956, P.L. 1795 as amended for fertilizer and herbicide composition.
- B. Seed per Pennsylvania Seed Act of 1965, Act No. 187 as amended.

1.6 QUALITY ASSURANCE

- A. Seed Mixture: Provide seed mixtures in containers showing percentage of seed mix, germination, year of production, net weight, date of packaging and location of packaging. Use no seed older than nine months.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.
- B. Fertilizer: Deliver fertilizer in waterproof bags showing weight, chemical analysis and name of manufacturer.

1.8 SCHEDULING

- A. Planting Restrictions: Plant during one of the following periods.
 - 1. Spring Planting: March 15 to May 15
 - 2. Fall Planting: August 15 to October 15
 - 3. Immediately following backfilling new curbs, sidewalks and sewer trenches
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

1.9 LAWN MAINTENANCE

- A. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:
 - 1. Seeded Lawns: Sixty (60) days from date of Substantial Completion.
 - a. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established, continue maintenance during next planting season.
- B. Maintain and establish lawn by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn.
 - 1. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch. Anchor as required to prevent displacement.

PART 2 - PRODUCTS

2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.
- B. Permanent Seeding for Mowed Lawn Areas:

Seed requirements meeting the specifications Section 804 set forth in the current edition PennDOT's Publication 408 for Formula B.

Or

<u>Name</u>	<u>Proportion by Weight</u>	<u>Purity</u>	<u>Min. % Germ.</u>	<u>Max. % Weed Seed</u>
Poa pratensis				
Kentucky Bluegrass (Use 3 or more vari. or types)	50%	85%	85%	0.20%
Lolium perenne				
Turf-Type Perennial Ryegrass	25%	98%	90%	0.20%
Penn-Fine Perennial Ryegrass				
Citation II Perennial Ryegrass	25%	98%	90%	0.20%

2.2 TOPSOIL

- A. Topsoil: Natural or cultivated surface-soil layer containing not less than 2% or more than 10% of organic matter, as specified in AASHTO designation T194. The material contains sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than two (2) inches in diameter. Topsoil shall be free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.
 - 1. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
 - 2. Topsoil Source: Import topsoil or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites approved by PennDOT.

2.3 FERTILIZER

- A. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

2.4 MULCHES

- A. Mushroom Manure: Shall comply with the specifications set forth in Section 805 in the current edition of PennDOT's Publication 408.

2.5 EROSION-CONTROL MATERIALS

- A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, six (6) inches long.
- B. Erosion-Control Fiber Mesh: Biodegradable twisted jute or spun-coir mesh, a minimum of 0.92 lb/sq. yd., with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive lawns and grass for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
 1. Protect adjacent and adjoining areas from hydroseeding overspray.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 LAWN PREPARATION

- A. Limit lawn subgrade preparation to areas to be planted.
- B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 6 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Install four (4) inches of topsoil to the loosened subgrade, seeded and fertilized with mushroom manure
- C. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future.
- D. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

3.4 TOPSOIL AND SEEDING

- A. All grass areas disturbed shall be restored using thirteen (13) inches of select backfill material and new screened topsoil (min. 4" thick) seeded and fertilized with mushroom manure.
- B. The selected material shall be placed in two (2) 6-1/2" lifts and compacted to 95% at optimum moisture.
- C. The remaining four (4) inches of the trench shall be backfilled with screened topsoil and fertilized with mushroom manure.
- D. Prior to the start of restoration, a seed mixture formula and accompanying certification must be provided to the Municipality for review.
- E. Any grass not maturing in the maintenance period shall be top dressed and reseeded. The maximum width permitted to be disturbed during sanitary sewer construction is ten (10) feet.

3.5 LAWN RENOVATION

- A. Renovate existing lawn and areas damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.
 1. Reestablish lawn where settlement or washouts occur or where minor regrading is required.
- B. Remove sod and vegetation from diseased or unsatisfactory lawn areas; do not bury in soil.
- C. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new topsoil.
- D. Install topsoil and seed as required for new lawn areas.
- E. During hot weather, straw should be mixed in with the topsoil and mulch.

3.6 SATISFACTORY LAWNS

- A. Satisfactory Seeded Lawn: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities.
- B. Reestablish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory.

3.7 COMPLETE PREPARATION AND CLEANUP INCLUDING MISC. ITEMS

- A. The entire project shall be prepared before the start of work, cleaned up afterwards. Proposed restoration items include:
 1. **Carefully removing existing landscaping materials, bagging the bulbs and trees and moving the materials to the side for replanting.**
 2. All municipal signs removed shall be delivered to the Public Works Building; the Contractor will replace them upon completion of the project.
 3. Clearing/trimming debris and brush and trees required.
 4. All yard decorations (i.e. rock gardens, planting areas, etc.) shall be carefully stored on-site outside of the limits of trenching activity. Upon completion of restoration within this property, the relocated yard decoration must be placed at the same location as it was present prior to trenching. Final lawn decoration location approval is reserved for the property owner and the Municipality or its authorized representative.
 5. Providing temporary access to properties during sanitary sewer installation.
 6. All construction areas are to be restored to a condition equal to that of which was present prior to construction.
 7. All finished work must be acceptable to the Municipality and the Property owner or else the work will need to be redone at no additional cost to the Municipality.
- B. Any private light lamp posts or electrical fixtures within the limits of work under this contract shall be carefully removed and placed on the owner's property. The contractor shall replace any lamp posts or electrical fixtures after construction is completed. There will be no additional compensation for replacing these items.
- C. Any fences removed by work under this contract shall be reinstalled in kind and in the same location to the satisfaction of the engineer, project manager, and the property owner as a part of this item. No additional compensation will be provided for fence removal/replacement.
- D. All shrubs, bushes, etc. within the limits of work shall be carefully removed by the contractor and placed on the property owner's lawn outside the limits of work. The contractor shall replant any shrubs, bushes, etc. after construction is completed. There will be no additional compensation for replanting these items and the cost should be included in the cost for each part of the project. **If the contractor damages a shrub, bush, tree, etc. in the process of completing their work, the contractor will be responsible for replacing the damaged shrub, bush, tree, etc. with a new one as a part of this item at no additional cost to the Municipality.**

END OF SECTION 02920

02920 SITE RESTORATION

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SECTION 131100 - SWIMMING POOLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The BIDDING REQUIREMENTS, CONTRACT FORMS, AND CONDITIONS OF THE CONTRACT and applicable parts of DIVISION 1 - GENERAL REQUIREMENTS, as listed in the Table of Contents, be included in, and made a part of this Section.

1.2 SUMMARY OF WORK (*for general guidance-not inclusive*)

A. Introduction

1. Provide labor, materials, equipment, and services necessary to renovate the filter system and piping. This work must include the surge tank structure as well as products listed in Part 2 of Section 131100.

B. Work included in this section:

1. It is the intent of this section to place the entire responsibility for the renovation of the pool (including the construction of the surge tank) under one vested Contractor. Under this section the Contractor will provide but is not necessarily limited to the following:
 - a. Provide equipment and services required for erection and delivery onto the premises the equipment or apparatus provided. Remove equipment from premises when no longer required.
 - b. Layout, excavate, remove from the construction site, replace, and grade materials as required beyond the limits of excavation of the surge tank to complete the work described in this section. Reference Division 31 - Earthwork.
 - c. Grade and replace load bearing or high plasticity index soil, pump and dewater as necessary to keep excavations free from water during construction and provide sub-surface drainage beneath the surge tank(s) as needed or required in the project geotechnical report. Reference Division 31 - Earthwork.
 - d. Provide and maintain proper shoring and bracing for existing utilities, sewers and building foundations where required for related excavations. Reference Division 31 - Earthwork.
 - e. Provide electrical conduit, wiring, junction boxes etc. to low voltage pool equipment within pool filter/chemical rooms per Division 26 - Electrical. (Low voltage is considered less than 110 V.)
 - f. Coordinate for required bonding and grounding of the surge tank shell, fittings, and equipment.
 - g. Provide necessary piping and valving as shown on the drawings and specified herein.
 - h. Provide individually sized housekeeping pads for each pool pump. Provide housekeeping pads for pool equipment as required in the drawings.
 - i. Construct the cast in place surge tank as described in these specifications and detailed on the drawings, including reinforcement steel, inserts, fittings, and embedded items (piping, anchors, etc.) for the surge tank. Reference Division 3 - Concrete and

Structural. Before commencing the placement of concrete, verify electrical bonding of the surge tank embedded items and reinforcing steel. Also, coordinate and arrange required electrical, plumbing and or building inspections.

- j. Provide for the storage of pool related equipment, materials, and systems. Items are the responsibility of the Contractor until accepted by the owner.
- k. Obtain final acceptance by jurisdictional health department(s).
- l. Start, test, calibrate and adjust mechanical equipment, electrical equipment, recirculation, chemical, and other supplied systems. Instruct the Owner's representative in the systems operation and maintenance as described herein.

C. Related work specified in other sections:

- 1. The following work related to the swimming pool must be completed by other trades.
 - a. Provide, erect, and maintain necessary barricades, signs, lights, and flares for pool construction to protect workers and the public.
 - b. Provide and maintain proper shoring and bracing for existing utilities, sewers and building foundations where required for swimming pool related excavations. Reference Division 31 - Earthwork.
 - c. Construct pump pit and backwash pit including reinforcement, inserts, wall sleeves, anchors, access hatches, and fittings. Reference Division 3 - Concrete.
 - d. Prior to concrete pours, verify electrical bonding of the surge tank embedded items. Coordinate and arrange required electrical, plumbing and or building inspections that must be performed on embedded items. Reference Division 26 - Electrical.
 - e. Provide sanitary sewer and storm drain connections. Reference Division 22 - Plumbing.
 - f. Provide chlorine resistant caulking (sealant) and backer rod on pool decks. Reference Division 7 - Thermal and Moisture Protection.

D. Related work specified in Plumbing section. Reference Division 22 - Plumbing. Work that must be completed by others.

- 1. Provide trench drains and area drains on pool deck.
- 2. Provide sanitary sewer piping from the filter room including floor drains, sumps, and sump pump.
- 3. Provide water service to hose bibbs, flush hydrant boxes and auto-fill bypass to air gap above fill funnel(s). Provide the slow closing solenoid valve(s) in the bypass auto-fill piping.
- 4. Provide water meter on the fresh water supply line upstream of the manual fill valve and the slow closing solenoid valve.

E. Related work specified in Electrical sections. Reference Division 26 – Electrical. Work that must be completed by others.

- 1. Provide motor starters, auxiliary contacts, magnetic relays, emergency stops and other electrical control devices necessary for the complete operation of the pool systems. Provide power to Variable Frequency Drive pool pump starters and power from VFD to the pool pump motor.
- 2. Ground and bond surge tank structures, fittings, and equipment in accordance with Article 680 of the N.E.C. Test and verify that the system electrical ground is true and solid. Provide certification to this effort.

3. Obtain permits, inspections, and approvals of wiring including grounding and bonding of metal components associated with the pool in accordance with Local, State and National Electrical Codes.
4. Confirm electrical conduits that penetrate the surge tank shell are watertight and installed per N.E.C. Article 680.

1.3 QUALITY ASSURANCE

- A. The specifications and drawings illustrate and detail one (1) swimming pool systems. Certain technical aspects of the design are common only to pool systems planned for public use. Understanding these aspects, their functions and interaction through experience is vital to completing a successful operating system. It is a mandatory requirement that the Contractor have achieved such experience as a prerequisite for bidding on this project.
1. The Swimming Pool Contractor to refer to section 002113 – Instructions to Bidders for bonding requirements.
 2. If the Swimming Pool Contractor is submitting on this project as the Prime Contractor, the Swimming Pool Contractor must include a written performance bond from an approved surety company registered in the State of Pennsylvania certifying that the Swimming Pool Contractor will provide 100% Performance, Labor, and Materials on this Project.
 3. If the Contractor has not received prior written approval for this project or has not been included in the pre-approved list of Contractors, they must submit a list of projects meeting the aforementioned qualifications, including contact information of the General Contractor must be submitted for review and approval at least 10 days prior to bidding of the project. The Contractor must have completed at least five (5) public-use pools with individual water surface areas in excess of 2000 square feet and a depth of 8'-0" or more within the past 10 years.
 4. The Contractor must submit prior to the start of construction the name of the on-site Project Superintendent including their relevant experience. The Contractor's on-site Project Superintendent must have completed at least five (5) public-use pools with individual water surface areas in excess of 2000 square feet and a depth of 8'-0" or more within the past 10 years. A list of projects meeting the aforementioned qualifications, including contact information of the General Contractor as well as Owner must be included with the experience submittal. Project Superintendent on the project cannot change unless written authorization has been provided by the Architect and Owner.
 5. The Owner reserves the right to reject a bid if the evidence submitted by, or investigation of, the Contractor fails to satisfy the Owner that the Contractor is properly qualified to carry out the obligation of the contract and to complete the work described or if the Contractor does not have the qualifications stated herein. Subject to compliance with item 2 above on this specification.
 6. The following Contractors have been pre-approved. The Contractor must meet the requirements listed above.

Acapulco Pools/Gall Construction
1550 Victoria St. N
Kitchener, ON N2B3EZ
Phone: 519.743.6357

Aqua Pools, Inc
1438 Electric Ave, P.O. Box L
East Pittsburgh, PA 15112
Phone: 412.824.6900

High Tech Pools 31333 Industrial Pkwy North Olmstead, OH 44070 Phone: 440.979.5070	Main Line Commercial Pools 441 Feheley Drive King of Prussia, PA 19406 Phone: 610.279.9285
Patterson Pools 1685 Westbelt Drive Columbus, OH 43228 Phone: 1-800-876-0484	Olympia Pools 4040 Penn-Belt Pl., Suite 100 Forestville, MD 20747 Phone: 301.420.2020
Patterson-Stevens 400 Sawyer Avenue P.O. Box 117 Tonawanda, NY 14151 Phone: 716.873.5300	William L. Watson Co. 8064 North Main St. Eden, NY 14057 Phone: 716.992.3220
All State Technology 10 Lark Ln. #9170 Oak Ridge, NJ 07438 Phone: 201-874-9294	

1.4 REGULATORY AGENCY REQUIREMENTS AND ENGINEERING SERVICES

- A. The system must comply with necessary pre-construction approvals.
- B. Give necessary notices, obtain permits, and pay government fees, and other costs in connection with his work, including the filing of necessary as-built drawings, prepare documents (including any amendments to the approved construction documents) and obtain necessary approvals of governmental departments having jurisdiction over their work. Obtain required certificates of inspection for his work and deliver copies to the Owner and Architect before requesting acceptance and final payment for the work.
- C. Include in the work, without extra cost to the Owner, labor, materials, services, apparatus, or drawings in order to comply with applicable laws, ordinances, rules, and regulations, whether or not shown on drawings and/or specified.

1.5 COORDINATION AND CLARIFICATION

- A. Coordinate with other trades' work relating to this section.
- B. Must establish with other trades, having related work in this section, that work necessary to complete the pool as shown on the drawings and in the specifications is included in the base bid and alternates to the Owner.
- C. If in doubt regarding the responsibility for work covered in this section and/or discovery of errors or omissions in the bidding documents, notify the Architect through channels established by the specifications and request a clarification ten (10) days prior to the bid date.

1.6 ALTERNATES

- A. Review the description of the alternates in Division 1 and on the drawings for possible effect upon work in this section. Alternates related to the work in this section are described in this division and on the bid proposal form.

1.7 CONTRACTOR'S ALTERNATE PROPOSAL

- A. Submit bid to the owner based on materials, equipment and methods as specified in this Section. No substitution of material will be allowed.
- B. It is the intent of the contract documents to encourage competition. The base proposal must include the construction methods and equipment as specified and detailed. Proposed system substitutions must have prior written approval by the Architect.
- C. If there is a deviation from the basis of design equipment, confirm that engineering criteria are appropriate for the substituted equipment.
- D. Substitutions of specified construction methods and equipment must include a complete submittal as required by these specifications and drawings of appropriate scale incorporating required changes. Provide a list of at least ten (10) satisfactory installations comparable to this project that have been manufactured and installed under the manufacturer's current legal name. Submit a list of such projects with the name, address and current telephone number of the Owner's Operator and Architect of Record to the Architect on the bid date.
- E. Changes or modifications to the Contract Documents that are not authorized by the architect are the sole responsibility of the Contractor.

1.8 SUBMITTALS

- A. Submittals must be made in accordance with the requirements of Division 1 - General Requirements and in strict compliance with the following procedures and guidelines.
- B. One (1) set of shop drawings and engineering data must be tabbed, indexed, and referenced to the specifications, compiled into an electronic submittal, and submitted in two stages. The first stage must include items for the surge tank shell(s), reference swimming pool structural specifications. The second stage must be for remaining items. Each section of items must be prefaced by a cover sheet listing the items submitted within the section. Electronic submittals must be organized, numbered, and submitted in the same format and order as the project specifications. Only complete sets will be reviewed.
 - 1. Engineering data covering systems, equipment, structures, and fabricated materials, which will become a permanent part of the work under this contract, must be submitted for review. This data must include drawings and descriptive information in sufficient detail and scale to show the kind, size, arrangement, and operation of component materials and devices; the external connections, anchorage and supports required; performance characteristics; fabrication and dimensions needed for installation and correlation with other materials and equipment. A certification, in writing, must be provided indicating that equipment will fit in the space allotted and as shown on the drawings.

2. Submittals regardless of origin must be stamped with the approval of the Contractor and identified with the name and number of this contract, Contractor's name, and references to applicable specification paragraphs and contract drawings. Each submittal must indicate the intended use of the item in the work. When catalog pages are submitted, applicable items must be clearly identified. The current revision, issue number, and date must be indicated on drawings and other descriptive data.
3. The submittals will not be accepted from anyone but the Contractor. Submittals must be consecutively numbered in direct sequence of submittal and without division by subcontracts or trades.
4. The Contractor's stamp of approval is a representation that the Contractor accepts full responsibility for determining and verifying quantities, dimensions, field construction criteria, materials, catalog numbers and similar data, and that he has reviewed or coordinated each submittal with the requirements of the work and the contract documents.
5. Each submittal must include a statement prepared by the originator of the drawings and data, certifying compliance with the contract documents except for deviations, which are specifically identified.
6. Deviations from the contract documents must be identified on each submittal and must be tabulated in the Contractor's letter of transmittal. Such submittals must, as pertinent to the deviation, indicate essential details of changes by the Contractor (including modifications to other facilities that may be a result of the deviation) and required piping and wiring diagrams.
7. The Contractor must accept full responsibility for the completeness of each submission, and, in the case of a resubmission, must verify that exceptions previously noted have been considered.
8. The need for more than one resubmission, or a delay in obtaining review of submittals, will not entitle the Contractor to an extension of the contract time unless the delay of the work is directly caused by a change in the work authorized by a change order.
9. Review of drawings and data submitted by Contractor will cover only general conformity to the drawings and specifications, external connections and dimensions that affect the layout. Review does not indicate a thorough review of dimensions, quantities, and details of the material, equipment, device, or item shown. Review of submittals does not relieve Contractor from responsibility for errors, omissions, or deviations, or responsibility for compliance with the contract documents.
10. When the drawings and data are returned marked REJECTED, REVISE AND RESUBMIT or SUBMIT SPECIFIED ITEM, the corrections must be made as noted thereon and as instructed and six corrected copies (or one copy and one corrected reproducible copy) resubmitted.
11. Resubmittals must bear the number of the first submittal followed by a letter (A, B, etc.) to indicate the sequence of the resubmittal. Resubmittals must be indexed, tabbed, referenced to the specifications, and bound in a three-ring binder and submitted at one time.
12. When corrected copies are resubmitted, the Contractor must, in writing, direct specific attention to revisions and must list separately revisions made other than those called for on previous submissions.
13. When the drawings and data are returned marked NO EXCEPTIONS TAKEN or MAKE CORRECTIONS NOTED, no additional copies are to be provided unless specifically requested to do so for record.

C. Permits, Receipts and Test Reports

1. Provide the Architect with copies of permits and receipts for fee payments.
 2. Submit a sample format for each test report intended for use. Submit test reports required herein only on approved forms.
- D. Include complete product data indexed, tabbed, and referenced to specifications with 8 ½" x 11" cover sheet covering:
1. Paragraph 2.1 - Pumping Equipment
 2. Paragraph 2.2 - Filtration Equipment
 3. Paragraph 2.3 - Piping Systems
 4. Paragraph 2.4 - Chemical Treatment Systems
 5. Paragraph 2.5 - Chemistry Monitoring and Control Systems
 6. Paragraph 2.6 - Flow Meters
 7. Paragraph 2.7 - Water Level Controllers
 8. Paragraph 2.8 – Surge Tank Accessories
 9. Paragraph 2.9 - Waterproofing
 10. Paragraph 2.10 - Sealants
- E. Include engineering/construction drawings for the surge tank structure.
1. Reference Division 3 - Concrete.
- F. Include engineering construction drawings for pool piping.

1.9 TESTING REPORTS

- A. Provide all testing reports as described in the specifications. Testing report(s) and any additional documentation of the test(s) must be submitted to the Architect within seven (7) days of the commencement of the test(s) unless otherwise noted. The following testing report(s) must be submitted for review/record:
1. The pool piping must be hydrostatically pressure tested prior to backfilling. Hydrostatic pressure tests must be performed by the Contractor and witnessed by the Owner, or a representative designated by the Owner.
 2. The surge tank must be tested for water tightness prior to the application of any finishes. The water tightness test must be performed by the Contractor and witnessed by the Owner, or a representative designated by the Owner.
 3. Concrete test panels/cylinders must be tested for compressive strength. The Contractor to produce test panels/cylinders to be tested by a third-party testing agency provided by the Owner. Refer to specifications Division 3 – Concrete

1.10 OPERATION AND MAINTENANCE MANUALS AND CLOSE-OUT SUBMITTALS

- A. Detailed operation and maintenance information must be supplied for equipment requiring maintenance or other attention. The equipment supplier and/or the Contractor must prepare an operation and maintenance manual for equipment. Parts lists and operating, and maintenance instructions must be provided.
- B. Each operation and maintenance manual must include the following:

1. Equipment function and calibration, normal operating characteristics, and limiting conditions.
2. Assembly, installation, alignment, adjustment and checking instructions.
3. Operating instructions for startup, routine and normal operation, regulation, and control, shut down and emergency conditions.
4. One (1) copy of instructional videos.
5. Operating cycles must be specifically described in outline format and in referenced detail. A wall-mounted color-coded piping flow diagram must be provided in the pool equipment room. The diagram must be engraved on laminated plastic with color-coded piping to match the color of coding on piping, and including valves identified with number on tags. The minimum size is 11-inch x 17 inch.
6. Include manufacturer recommended maintenance schedule, parts lists, piping diagram (to agree with wall mounted diagram) and trouble-shooting information for pool mechanical equipment.
7. Using reference to keyed valves and wall diagram, include specific written instructions for procedures that must be followed for the following:
 - a. Emptying and refilling the pool including de-watering during the period that the pool will be empty.
 - b. Water level control adjustment and chemical control operation.
 - c. Normal surge tank operation and balancing.
 - d. Filter operation and backwashing; and
 - e. Super chlorination.
8. Lubrication and maintenance instructions.
9. Guide to "troubleshooting."
10. Parts list and predicted life of parts subject to wear.
11. Outline, cross section, and assembly drawings; engineering data and wiring diagrams.
12. Test data and performance curves, where applicable.
13. Specific written instructions for procedure for emptying and refilling the pool including de-watering during the period that the pool will be empty. Provide a yellow warning sign 8-1/2 in. x 11 in., that must be mounted in the filter room, that reads:

WARNING
Prior to emptying Pool
Consult O & M Manuals for Procedures

Add another sign that reads:

Keep Caps, Plugs and Tops Tight Fitting to Prevent Escape of Fumes.

14. One set of applicable submittals must be included in each manual.
- C. The operation and maintenance manuals must be in addition to instructions or parts lists packed with or attached to the equipment when delivered, or which may be required by the Contractor.
- D. Manuals and other data must be printed on heavy, first quality paper, 8-1/2 x 11-inch size with standard 3-hole punching and inserted in plastic covers. Drawings and diagrams must be reduced to 8-1/2 x 11 inches or 11 x 17 inches. Where reduction is not practical, larger drawings must be folded separately and placed in envelopes that are bound into the manuals. Each envelope must bear suitable identification on the outside.

- E. Six (6) bound volumes of each manual must be submitted. Parts lists and information must be assembled in substantial manuals and permanent, three-ring or three-post binders. Material must be assembled and bound in the same order as specified, and each volume must have a table of contents and suitable index tabs.
- F. Material must be marked with project identification. Non-applicable information must be marked out or deleted.
- G. Shipment of equipment will not be considered complete until the required manuals and data have been received.
- H. The Contractor must provide, assemble, and inventory all deck, loose, safety, and maintenance equipment including any loose mechanical equipment prior to the Owner taking possession of the pool. The Contractor must provide a checklist that has been signed by the Owner verifying receipt of all items listed in Part 2 - Products.

1.11 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver material in manufacturer's original, unopened containers and crates with labels intact and legible.
- B. Deliver materials in sufficient time and quantity to allow continuity of work and compliance with approved construction schedule.
- C. Handle materials in a manner to prevent damage.
- D. Store materials on clean raised platforms with weather protective coverings. Provide continuous protection of materials against damage or deterioration.
- E. Remove damaged materials from site.

1.12 WARRANTIES

- A. The Contractor warrants to the Owner and Architect that materials and equipment provided under the contract will be of good quality and new unless otherwise required or permitted by the contract documents, that the work will be free from defects not inherent in the quality required or permitted, and that the work will conform with the requirements of the contract documents. Work not conforming to these requirements, including substitutions not properly approved and authorized will be considered defective. The Contractor's warranty will exclude remedies for damage or defect caused by abuse, improper or insufficient maintenance, improper operations, modifications not executed by the Contractor or improper wear and tear under normal use. If required by the Architect, provide satisfactory evidence as to the kind and quality of materials and equipment.
- B. The Contractor must agree to repair or replace defective or non-complying work at no cost to the Owner upon written notification from the Owner within the warranty period. Pro-rated warranties are not acceptable.

- C. Warranties must be for a period of one year from the date of substantial completion or the owner begins using the pool unless otherwise specified. Submit warranties covering, but not limited to the following:
1. Defects in material or workmanship of the surge tank structure(s) causing a loss of water for a period of three (3) years.
 2. Defects in material, manufacture and installation of the filtration, backwash, chlorination, pH adjustments and cleaning systems, including controls for a period of one (1) year.
 3. Manufacturer's minimum eighteen (18) month warranty against defective materials, components, and workmanship in the variable frequency drive system.
 4. Manufacturer's minimum fifteen (15) year warranty on the filter tank and lining against defective materials or workmanship of the tank and components. (Additional warranty time may be purchased from the manufacturer.) Prorated warranties are not acceptable. Flexsol 3000 lined vessels must carry a fifteen (15) year limited non-prorated warranty. The filter manufacturer must bear the responsibility for suitability of lining and must be the sole source for the specified warranty. Internal tube elements must carry a fully rated 10-year warranty. Valve bodies and the regenerative media filter controller must carry a 5-year fully rated warranty. Valve operators and system accessories including the bump tire, quick exhaust valve and solenoid valve must carry a one-year warranty as provided by the product manufacturer. Unless otherwise specified, workmanship must be guaranteed first class and carry a one (1) year warranty.
 5. Defects in material, workmanship, and installation of the pool piping system and recirculation fittings for a period of three (3) years.
 6. Manufacturer's minimum one (1) year warranty against defective materials, components, and workmanship in the sanitizing feed system.
 7. Manufacturer's minimum five (5) year warranty against defective materials, components, and workmanship in the pool chemical controller. ORP, pH, flow and temperature sensors must be covered by a standard two (2) year warranty. Other sensors and flow cell components must be covered by a standard one (1) year warranty.
 8. Manufacturer's minimum one (1) year warranty against defective materials, components, and workmanship in the pool water level control system.
 9. Defects in material, workmanship and installation of the surge tank and backwash pit waterproofing finish against delamination for a period of one (1) year.

1.13 SYSTEM TRAINING

- A. A qualified representative of the Contractor performing work under this section must put the equipment into operation and instruct the Owner's representatives in the operation of this equipment to the Owner's satisfaction immediately after project's substantial completion.
- B. The Contractor's training representative must have completed the equipment/system's manufacturer's training requirements and be certified, by the manufacturer, to provide and teach system training.
- C. The representative from the Contractor must be either a CPO (Certified Pool Operator) or have an AFO (Aquatic Facility Operator) certification.
- D. Training periods to consist of 32 hours of on-site training and scheduled as follows:

1. 16 hours of initial training on the complete swimming pool system. Training to include winterization procedures – Refer to Section 1.2 for winterization protocol. The 16 hours of initial training must be comprised of at least 4 hours of training on water chemistry analysis and adjustment. The water chemistry training will include in-depth review of the use of the Langlier index and its computation.
2. The initial 16 hours of training must include information on the care, operation, adjustment, and maintenance of items provided by the Contractor under the “Part 2 – Products” section of this specification.
3. 16 hours of training after the Owner's staff has had experience operating the system. This time may be requested after the pool has been placed in operation within a period of one (1) year from the time the pool was accepted by the Owner. The additional training must contain at least 2 hours of review of water chemistry.
4. Provide a project specific video recording instruction manual in addition to the training sessions. The video instructions must be project specific and must include information on the care, operation, adjustment, and maintenance of items provided by the Contractor under the “Part 2 – Products” section of this specification. This video recording must be done separate from the Owner training.
5. The Contractor must include one (1) copy of video recording instructions in each Operations and Maintenance Manual.

1.14 POOL FILL WATER QUALITY

- A. The Owner is to bear the cost of the water required for two (2) complete fillings of the surge tank (the initial water tightness test and the final filling). Removal of iron or copper (if in excess of .3 ppm) will be required for the final fill to avoid staining of the pool finish. Subsequent fillings or partial fillings (more than 25%) of the pool is by the Contractor, at its own expense.
- B. Provide the necessary plant equipment so that the temperature of fill water will be within plus or minus 10 degrees of the ambient air and/or the pool structure at the time of filling. Extreme caution is urged if the temperature variance is greater than 10-degree F.
- C. Provide the necessary chemicals and to adjust and balance the water chemistry in the pool to the following levels:

pH	7.4 - 7.6
Calcium Hardness	200 - 400 PPM
Total Alkalinity (Sodium Hypochlorite)	80 - 120 PPM
Langelier saturation index	-0.3 - +0.3
Total Dissolved Solids (TDS)	not to exceed 1,500 PPM

1.15 START-UP CHEMICALS

- A. The Contractor must maintain the chemical balance of the pool water (including the cost of chemicals required) until the pool and mechanical system(s) are fully operational and accepted by the Architect and the Owner.
- B. Provide the Owner with sufficient quantities of the necessary chemicals to maintain the pool operation after the owner begins using the pool.

1. The Contractor is required to provide chemical quantities as shown on the drawings for the following chemicals:
 - a. Sodium Hypochlorite
 2. The Contractor is required to provide chemical quantities as shown on the drawings for the following balancing chemicals:
 - a. Sodium Bicarbonate
 - b. Calcium Carbonate
 - c. Sodium Thiosulfate
- C. Chemicals must be provided to the Owner must include those required by the chemical feed systems provided.

1.16 RECORD DRAWINGS

- A. Provide a complete set of record drawings of the entire pool system(s) including sub-systems. Record drawings must be prepared in accordance with the requirements of Section 017839 and must be a complete, stand-alone set. The Contractor is permitted to obtain original documents and copy them for this purpose only. Provide a digital record set (latest version of AutoCAD or compatible software).

PART 2 - PRODUCTS

2.1 PUMPING EQUIPMENT

- A. Proposed substitutions must include a mechanical drawing incorporating required changes in layout, piping, and valves. The cost of such changes must be included in the price of the substitute. Confirm correct pump motor voltage prior to ordering variable frequency drives. Confirm by 1/4-inch scale shop drawing that the pumps provided will fit within the available space and can be reasonably removed for servicing.
1. The entire pumping unit must be mounted on a base using cap screws to preserve the back-pull-out feature of the pump. Pumps must not be secured with floor studs or “all-thread.” The pump base must be coated with an epoxy coating.
 2. Recirculation and Feature Pumps – Metallic Components
 - a. Provide a fusion-bonded epoxy coating touchup paint on all pool pumps. The thickness must be 8 to 12 mils (heavy film). Provide primers if required to resist chlorinated water <10 ppm. The coating must be Scotchkote 134 manufactured by Fusecote or approved equal.
 - b. Provide a hair and lint strainer, for each pump, of fiberglass or epoxy coated stainless-steel construction with a clear observation top in the sizes (or pipe sizes) indicated on the drawings. Verify and coordinate pipe and pump suction sizes in the field. Strainer must be of a low pressure drop full-open or a tapered eccentric reducing type. Straight reducing type strainers will not be acceptable without the addition of an approved tapered eccentric reducer between the strainer and the pump

(in which case, sufficient space in the pump pit must be verified). Strainer must be a straight non-reducing type with an approved tapered eccentric reducer at the front of the pump at recirculation pump. Provide a stainless-steel basket with at least 4 times the free open area as the inlet pipe, and one spare basket with each strainer.

- 1) Basis of Design: As manufactured by MerMade Filter Inc., or Neptune/Benson Inc., or Fluidtrol Process Technologies, Inc.

3. Other System Pumps and Motors

- a. Provide one (1) portable utility pump(s). The pump(s) must be a 1 HP, 3600 RPM, 115-volt, 1 phase, 60 cycle unit capable of 60 GPM at 25 ft. TDH.

- 1) Basis of Design: Pump must be a Godwin GSP10 or approved equal.

B. Variable Frequency Drive Starters

1. Provide variable frequency drive starters (VFD) for pool recirculation pump only. VFDs must be Eco-Flow-C by H2Flow Controls, AcuDrive by Pentair, GreenDrive by Neptune Benson, or approved equal.
 - a. Basis of Design: AcuDrive by Pentair
2. Ensure that equipment is provided with the correct operating voltage and that interconnected electrical and electronic equipment must adequately communicate and operate the specified pumping equipment. Equipment installations must meet or exceed the requirements of the National Electric Code and other local and state regulations.
3. Variable Frequency Drive Capabilities

- a. Provide complete VFD as specified herein or in the equipment schedule for loads designated that must be variable speed or variable flow.
 - b. The VFD must convert incoming fixed frequency three-phase AC power into a variable frequency and voltage for controlling the speed of three-phase AC induction motors. The VFD must be a six-pulse input design, and the input voltage rectifier must employ a full wave diode bridge. The output waveform must closely approximate a sine wave. The VFD must be of a PWM output design utilizing current IGBT inverter technology and voltage vector control of the output PWM waveform.
 - c. Indoor Applications: VFD must be fully enclosed in a corrosion resistant NEMA 12/IP54 UL listed enclosure.
 - d. VFD and required options will be incorporated by the VFD manufacturer into an integrated package, with a single input feed and main disconnect.
 - e. VFD must have a fused disconnect and battery back-up, for the purpose of maintaining programming in the event of a power outage.
 - f. The VFD must produce an output waveform capable of handling maximum motor cable distances of up to 1,000 ft. (unshielded) without tripping or derating.
 - g. The VFD must provide rated RMS fundamental output voltage. The VFD must utilize VVCPLUS, an output voltage-vector switching algorithm, or equivalent, in both variable and constant torque modes. This allows the motor to operate at a lower temperature rise, extending its thermal life.

- h. The VFD selected must be able to source the motor's full load nameplate amperage (fundamental RMS) on a continuous basis and be capable of running the motor at its nameplate RPM, voltage, current, and slip without having to utilize the service factor of the motor.
- i. The VFD must offer a programmable motor parameter that allows the total number of poles of a motor that must be programmed to optimize motor performance.
- j. VFD must automatically boost the power factor at lower speeds.
- k. The VFD will be capable of running either variable or constant torque loads. In either CT or VT mode, the VFD must be able to provide its full rated output current continuously and 110% of rated current for 60 seconds.
- l. An Automatic Energy Optimization (AEO) selection feature must be provided in the VFD to minimize energy consumption in variable torque applications.
- m. VFD must offer a motor spinning test that will run the motor at 5 Hz until the OK button is pressed. This feature will allow the user to determine if the motor is running in the correct direction.
- n. Switching of the input power to the VFD must be possible without interlocks or damage to the VFD at a minimum interval of 2 minutes.
- o. Switching of power on the output side between the VFD and the motor must be possible with no limitation or damage to the VFD and must require no additional interlocks.
- p. An Automatic Motor Adaptation (AMA) function must measure motor stator resistance and reactance to optimize performance and efficiency.
- q. Cooling must be via an aluminum heat sink and must prevent the introduction of ambient air to the electronics for cooling. With the exception of the water-resistant heat sink fan, electronics must be fully sealed within the enclosure.
- r. The VFD must have temperature-controlled cooling fans for quiet operation, minimized internal losses, and greatly increased fan life.
- s. VFD must provide full torque to the motor, given input voltage fluctuations of up to +10% to -10% of the rated input voltage.
- t. The VFD must include additional contacts for interface with the emergency stop function.

4. Harmonics:

- a. The VFD must provide internal DC link reactors to minimize power line harmonics and to provide near unity power factor.
- b. The VFD must be provided with line-side harmonic reduction, as required, to ensure that the current distortion limits, as defined in table 10.3 of IEEE 519-1992, are met.
- c. Harmonic solutions must be designed to withstand up to 2%-line imbalances with the maximum Current Distortion not to exceed 11% at 100% load.
- d. Harmonic solutions must be capable of withstanding up to 2% ambient voltage distortion with the maximum Current Distortion not to exceed 12% at 100% load.

5. Protective Features:

- a. VFD must have input surge protection utilizing MOV's, spark gaps, and Zener diodes to withstand surges of 2.3 times line voltage for 1.3 msec.
- b. VFD must include circuitry to detect phase imbalance and phase loss on the input side of the VFD.

- c. Printed Circuit boards must be conformal coated to reduce the corrosion effect from environmental gases and other conditions. The conformal coating must meet IEC 61721-3-3, Class 3C2 as standard.
- d. Automatic “No-Flow Detection” must be available to detect a no-flow situation in pump systems where valves can be closed. This must be functional in closed loop control or when controlled by an external signal.
- e. Dry-pump detection must be available to detect if the pump has run dry. If this condition occurs, the drive will be safely stopped. A timer must be included to prevent nuisance tripping.
- f. End-of-Pump curve detection must stop the motor when the pump is operating outside of its programmed pump curve.
- g. VFD must provide a flow compensation program to reduce energy by adjusting the Setpoint to match changes in flow (friction loss).
- h. VFD must include current sensors on three-output phases to detect and report phase loss to the motor. The VFD will identify which of the output phases is low or lost.

6. Interface Features:

- a. VFD must provide an alphanumeric backlit display keypad (LCP) which may be remotely mounted using a standard 9-pin cable. VFD may be operated with keypad disconnected or removed entirely. Keypad may be disconnected during normal operation without the need to stop the motor or disconnect power to the VFD.
- b. VFD Keypad must feature an INFO key that, when pressed, must display the contents of the programming manual for the parameter that is currently viewed on the display.
- c. VFD Display must have the ability to display 5 different parameters pertaining to the VFD or the load including: current, speed, DC bus voltage, output voltage, input signal in mA, or other values from a list of 92 different user-selectable parameters.
- d. A red FAULT light, a yellow WARNING light and a green POWER-ON light must be provided. These indications must be visible both on the keypad and on the VFD when the keypad is removed.
- e. Two-level password protection must be provided to prevent unauthorized changes to the programming of the VFD.
- f. A quick setup menu with factory preset typical parameters must be provided on the VFD to facilitate commissioning.
- g. A digital elapsed time meter and kilowatt hour meter must be provided in the display.
- h. VFD must offer as standard an internal clock. The internal clock can be used for: Timed Actions, Energy Meter, Trend Analysis, date/time stamps on alarms, Logged data, Preventive maintenance, or other uses.
- i. A battery back-up must be provided to maintain internal clock operation during power interruptions.
- j. Inputs and outputs must be optically isolated.
- k. The VFD must have two analog signal inputs. Inputs must be programmable for either 0 -10V or 0/4-20 mA.
- l. One programmable analog output must be provided for indication of the drive status. This output must be programmable for output speed, voltage, frequency, motor current and output power. The analog output signal must be 0/4-20 mA.

- m. The run permissive circuit must be capable of sending an output signal as a start command to actuate external equipment before allowing the VFD to start.
- n. The VFD must be equipped with a standard RS-485 serial communications port and front-of-drive accessible USB port.

7. Adjustments:

- a. The VFD must have an adjustable output switching frequency.
- b. Four complete programming parameter setups must be provided, which can be locally selected through the keypad or remotely selected via digital input(s), allowing the VFD to program for up to four alternate control scenarios without requiring parameter changes.
- c. In each programming setup, independent acceleration and deceleration ramps must be provided. Acceleration and deceleration time must be adjustable over the range from 0 to 3,600 seconds to base speed.
- d. The VFD must have four programmable “Bypass frequencies” with adjustable bandwidths to prevent the driven equipment from running at a mechanically resonant frequency. The feature must offer a Semi-Automatic program to simplify the set-up.
- e. VFD must include an automatic acceleration and deceleration ramp-time function to prevent nuisance tripping and simplify start-up.
- f. The VFD will include a user-selectable Reset function, which enables the selection of between zero and twenty restart attempts after a self-clearing fault condition (under-voltage, over-voltage, current limit, inverter overload, and motor overload), or the selection of an infinite number of restart attempts. The time between restart attempts must be adjustable from 0 through 600 seconds.
- g. An automatic “on-delay” function may be selected from 0 to 120 seconds.
- h. The VFD will include a user-selectable Auto-Restart function that enables the VFD to power up in a running condition after a power loss, to prevent the need to manually reset and restart the VFD.

8. Bypass

- a. Provide a manual bypass in conjunction with the VFD for the recirculation pump(s) consisting of a door interlocked main fused-disconnect pad lockable in the off position, a built-in motor starter and a four position DRIVE/OFF/BYPASS/TEST switch controlling three contactors. In the DRIVE position, the motor is operated at a programmable speed or flow rate from the VFD. In the OFF position, the motor and VFD are disconnected. In the BYPASS position, the motor is operated at full speed from the AC power line and power is disconnected from the drive so that service can be performed. In BYPASS Position, a soft starter will be in the circuit to allow the motor to avoid an across the line start. In the TEST position, the motor is operated at full speed from the AC line power. This allows the drive to give an operational test while continuing to run the motor at full speed in bypass.
- 9. Individual VFD options such as bypass, motor selection contactors, etc. must be incorporated by the manufacturer onto a single panel with a single input feed and main disconnect function. Enclosures must be UL listed and fully assembled by the VFD manufacturer.
- 10. Service Conditions:

- a. The ambient operating temperature of the VFD must be -10°C to 50°C (14 to 122°F).
- b. 0 to 95% relative humidity, non-condensing.
- c. Elevation to 3,300 feet (1000 meters) without derating.
- d. VFD's must be rated for line voltage of 525 to 690VAC, 380 to 480VAC, or 200 to 240VAC; with +10% to -10% variations. Line frequency variation of ± 2% is acceptable.

C. Pump Gauges

1. Pressure gauges must be provided on the discharge of the pumps.
2. Compound gauges must be provided at the intake port of the pumps, after the hair and lint strainer.
3. Gauges must be liquid filled, 316L stainless-steel bourdon tube type with a minimum 2-1/2-inch diameter dial, high impact polypropylene or stainless-steel case, corrosion resistant white scale with black divisions and numerals, 300 Series stainless-steel heavy duty rotary bushed movement, black enameled balanced Micrometer pointer.
 - a. Basis of Design: Gauges must be manufactured by Weksler Instrument Corporation or approved equal.
4. Scale ranges must be selected to indicate the normal system operating pressure of each system or location within the system. Pressure ranges must be calibrated in psig (0-60 psi) and compound gauge must be calibrated in inches of mercury (0-30 in Hg / 0-60 psi).
5. A stainless-steel filter type pressure snubber must be provided for each pressure gauge consisting of a 3/8-inch diameter by 1/8-inch-thick micro metallic stainless-steel filter and placed in the line just before the pressure gauge. Provide isolation brass valves or brass gauge cocks at each gauge for easy replacement and maintenance.

2.2 FILTRATION EQUIPMENT

- A. The filter system must consist of regenerative media filter tanks as shown on the drawings. Every aspect and component of the filter system must be certified by the National Sanitation Foundation (NSF) and bear the certification mark. The filter must have an engraved metal data plate permanently affixed on the face of the system that describes operational data and instructions and indicates startup date.
- B. It is the intent of these specifications to describe a filtration system complete in every respect with accessory items and supplied and warranted by one manufacturer.
- C. Regenerative Media Filters with Pre-Coat in a Closed Loop
 1. Filter System
 - a. Basis of Design: The filter system under this section must be a Defender by Neptune-Benson, Regenerator by Paddock or approved equal. System design based upon Neptune-Benson
 - b. It is the intent of these specifications to describe a filter system complete with accessory items supplied and warranted by one manufacturer.

- c. The primary components of the system consist of the main filter tank, flex tube filter elements, element assembly, bump mechanism, vacuum transfer system, sight glass, pressure gauge panel, inspection (viewing) window, valves, pressure transducers and automatic filter controller.
- d. Components and related subassemblies must be factory assembled and tested prior to shipment.

2. Filter Tanks

- a. The filter tanks must have a 60" side shell, suitable for 50 psi working pressure and hydrostatically tested to 75 psi. Tank shell must be not less than $\frac{1}{4}$ " thick. Bottom dished head must be not less than $\frac{1}{4}$ " thick. Top flat head must be not less than 1 $\frac{1}{2}$ ". thick. Material must be Type A-36 carbon steel.
- b. Welding must be performed by qualified operators. Joints must be butt or fillet welded inside and out by manual or automatic process. Welded joints must have complete penetration and fusion with little or no reduction of the thickness of the base metal. Welds must be free of coarse ripples, grooves, overlaps, abrupt ridges, or valleys. Welded surfaces must be chipped and brushed clean, when necessary, leaving no slag or splatter.
- c. Tank legs must be constructed of 6" x 2 $\frac{1}{2}$ " channel legs $\frac{1}{4}$ " thick. Filter models 24", 27" and 33' must have three (3) legs. Filter models 41", 49" and 55" must have four (4) legs. The material must be Type A-36 carbon steel. Bearing plates must be 10" x 5" x 1/2" type 304L stainless-steel. The bearing plate must have two (2) 5/8" drilled holes to secure to the floor with the 1/2" x 4 1/2" stainless-steel concrete anchors provided. The legs must be designed with bolted connections to minimize overall tank height for shipping and access into the mechanical room.
- d. The tank heads must be bolted to the shell with 7/8" diameter T304 stainless-steel threaded rods and nuts, 9" on center around the tank perimeter.
- e. Tanks must be equipped with a UL listed grounding lug.
- f. Tanks must incorporate connections for filter influent, effluent, drain; 1-1/2" vacuum transfer piping, 6" viewing window, hardware to facilitate cleaning of tube elements and interior inspection of filter and lift shaft gland. Refer to the drawings for pipe and connection sizes.
- g. Tanks must include brackets for mounting of automatic controller, gauge panel, filter / regulator, vacuum transfer blower and vacuum hose rack.
- h. The filter tank must include an integrally mounted hydraulic lifting device (davit). The davit assembly must be designed to lift the filter head and include a pivot mechanism allowing the head to rotate 180°, for access to the tube sheet.

3. Flexsol 3000 Interior Lining

- a. Interior surfaces must be grit blasted to white metal condition with a 3-4 mil profile. Blasted surfaces must be cleaned of dust or blast residue and primed as soon as is practical on the same day blasting is done.
- b. Flexsol 3000 must be a urethane, 100% solid plural component lining. Hardness must be 75 durometers on the Shore D scale. Break tensile strength must be 4,000 psi with elongation of less than 10%. Adhesion must be greater than 2,500 psi.
- c. Application of Flexsol 3000 lining must be done by experienced applicators using a high pressure, high temperature plural component system. Wetted surfaces including flange faces, manway rings and manway covers must be lined to 100 mils +/- 10 mils WFT.

- d. Hardness must be verified after curing to ASTM D 2240 standard.
- e. Flexsol 3000 lining must meet the NSF toxicity standard unconditionally and must be approved for use with the NSF approved filter.

4. Exterior Coatings

- a. Exterior surfaces must be grit blasted to white metal condition with a 2-3 mil profile. Blasted surfaces must be cleaned of dust or blast residue.
- b. Two coats of high solids enamel must be applied for a total developed film thickness of 5-8 mils.
- c. The manufacturer is to supply a minimum of 16 oz of high solids enamel touch-up paint.

5. Internal Components

- a. The filters must consist of flex tube elements, filter tube sheet, stainless-steel lift shaft and internal flow diversion assembly.
- b. The filter elements must be flexible tubes that provide the support structure for the media. The outer wall of the element must be fabricated of multi-filament high strength polyester braid. The element must have an internal T316 stainless-steel spring, which acts as a support structure for the braided filament.
- c. The filter element tube sheet must be fabricated of T316 stainless-steel and provide both support for the top of the element assembly as well as watertight seal to prevent media from escaping the filter tank.
- d. The lifts shaft must be fabricated from T316 stainless-steel and provide the internal connection between the filter element tube sheet and the external bump mechanism.
- e. The filter influent connections must be fitted with a T316 stainless-steel flow diversion assembly to eliminate disturbance to the filter elements during operation.
- f. Stainless-steel wetted fasteners must be Type 316.

6. Bump Mechanism

- a. The bump mechanisms must include a pneumatically operated tire mounted externally on the filter tank heads. The tire is alternately pressurized then depressurized causing the connected filter element assembly to move in an upward then downward fashion. This movement must provide the means of dislodging the media and accumulated solids, which then recoat the filter element.

7. Vacuum Transfer System

- a. The vacuum transfer systems must be provided to allow the recharging of media into the filter for either bag or bulk media.
- b. The vacuum must be a 5 peak HP, 115V, single phase motor, 60 Hz or 50 Hz, cULus listed.
- c. Vacuum must be supplied with mating electrical connections pre-wired into automatic filter controller for field final connection in a pre-assembled junction box.
- d. In-line filters with dual connections must be provided to prevent dust and media from being drawn into the blowers.

- e. Provide three (3) 1-1/2" SCH 80 PVC ball valves: for the vacuum drain line, the blower inlet, and the vacuum hose.
- f. Provide necessary pipe, fittings, and hardware for field plumbing of the vacuum transfer system.
- g. Provide ten (10) feet of 1-1/2" vacuum hose with required fittings.

8. Automatic Filter Controller

- a. The automatic controllers must provide total control of the system's filtration and regeneration cycles and provide necessary equipment interlocks and timing mechanisms to execute the filter program.
- b. The controllers must include an adjustable pressure switch, factory set to 50 psi. The switch must stop the recirculating pump and close the pneumatic valves if air pressure falls to 50 psi.
- c. The controller must contain at least two microprocessors that will monitor the functions of the system.
- d. The controller must control operation of the following functions:
 - 1) Bump cycle / manual or automatic.
 - 2) Pre-coating of the filter elements
 - 3) Stopping and starting of the main recirculating pumps
 - 4) Opening and closing of pneumatically operated valving
 - 5) Vacuum transfer system
 - 6) Heater cool down delay
 - 7) Auxiliary contacts to interlock chemical control or other equipment.
 - 8) Keyed switch to activate continuous, intermittent bump cycle for flex tube cleaning.
 - 9) 7-inch high-resolution LCD Screen with touch-screen interface
- e. The controller panel must display the following functions:
 - 1) Filter status
 - 2) Precoat status
 - 3) Last bump
 - 4) Recirculating pump status
 - 5) Vacuum transfer pump status
 - 6) System power
 - 7) Low pressure alarm
 - 8) Recirculating pump off alarm
 - 9) Pressure differential.
 - 10) Flow rate (operational feature when interlocked with VFD)
 - 11) Step-by-step animated graphics

- f. The controller enclosure must be NEMA 4X/IP66 approved system.
- g. The automatic filter controller will provide signal power to the main recirculating pump motor starters. The unit requires a device or variable frequency drive (VFD) and must be installed with control wiring.
- h. The automatic filter controller must be 120V, 1 phase, 20 amp rated and must be UL labeled.

9. Flow Meter

- a. A digital flow meter must be included with a 4-20mA, 0-10 VDC analog output.
- b. The flow meters must be wired into the VFDs to provide automatic speed control of the filter pump motors.
- c. The VFDs must compensate for varying filter head losses by maintaining the specified flow rate with the 4-20mA output signal of the flow meters.

10. Filter / Regulator

- a. The filter must include a combination filter / regulator. The regulator must be adjustable from 0 – 120 PSI. 1/2" FPT connections must be provided for field installation of air lines.

11. Water Separator

- a. One water separator with automatic drain must be included for the air compressor supplied. 1/2" FPT connections must be provided for field installation of air lines.

12. Air Compressor

- a. The filtration systems will require one (1) air compressor per mechanical room. The following is the minimum requirement: 20-gallon tank, 2 HP, 120 V, 1 phase, 15-amp, 5.2 CFM @ 90 psi, air pressure gauge, pressure relief valve, belt guard, pressure switch, air filter, tank drain.

13. Pneumatic Actuators

- a. The filter must include pneumatic actuators for one (1) effluent valve and one (1) precoat valve.
- b. The actuators must be double acting with valve mounted drilling to ISO 5211.
- c. The actuators must include two (2) 1/8" FPT ports for open / close connections. Flow control valves with quick connect fittings must be provided at the port to allow speed control adjustment for the open / close function of the actuators.
- d. Materials of Construction
 - 1) Body: aluminum alloy, extruded acc. to ASTM 6063, anodized acc. To UNI 4522.
 - 2) Ends: Diecast in aluminum alloy acc. To ASTM B179, epoxy-polyester coated.
 - 3) Pistons: Diecast in aluminum alloy acc. To ASTM B179.
 - 4) Pinion: Nickel-plated steel.
 - 5) Slideways: Acetal resin (LAT LUB 731320T).
 - 6) Fasteners: AISI 304 Stainless-steel.

- 7) Springs: Epoxy coated steel, pre-compressed.
 - 8) Seals: NBR Nitrile rubber.
 - 9) Lubricant: MoS2.
- e. The actuators must be factory lubricated to allow for 1,000,000 maneuvers.
 - f. The actuators must have adjustable travel stops for both directions.
 - g. Working temperature limits: 4° F to 186° F.
14. Fiberglass Eccentric Reducing Flanged Precoat Tees
 - a. Eccentric reducing precoat tees must be constructed of fiberglass with flanged connections. The tee must be equipped with influent, effluent connections as well as a precoat line branch connection sized in accordance with the drawings.
 - b. Flanged connections must be ANSI 125# dimensions.
 - c. Reducing tees must include a 4" FPT gauge connection.
 - d. Reducing tees must be designed for 50 psi operating pressure as manufactured by Neptune-Benson.
 15. Solenoid Valves
 - a. The filter must include three (3) single solenoid, 4-way valves mounted on a multi-station manifold for operation of the pneumatic actuators and bump mechanism.
 - b. The solenoids valves must include lighted DIN connectors.
 - c. The solenoid valves must be factory lubricated and must not require field lubrication.
 - d. The solenoid valves with multi-station manifold must be located on the bottom of the automatic filter controller, factory wired and include quick connect fittings for attachment to the pneumatic actuators and bump mechanism.
 - e. The solenoid valves must be SMC Series SY 7000.
 16. Valves
 - a. Valves 3" – 12" must be constructed with cast aluminum ASTM S12A housing and fully coated with Rilsan on interior and exterior surfaces. Internal components include EPDM resilient lining, Rilsan coated ductile iron disc and T304 stainless-steel shaft. Valves 14" and larger must be constructed with cast iron housing fully coated with nylon and with nylon coated ductile iron disc.
 - b. Valves must be butterfly valves and must be provided for the influent, effluent and precoat lines.
 17. Drain Requirements (By Others)
 - a. A sump pit or standpipe is required for dumping spent media and rinsing tube elements.
 - b. To prevent overflow the sump or standpipe drain piping must be sized for 300 GPM capacity.
 - c. If drain piping cannot be sized for 300 GPM, or if the sewer is at an elevation higher than the filter tank drain, use the following minimum sump sizes:
 - 1) Model SP-24: 130 gallons.
 - 2) Model SP-27: 160 gallons.

- 3) Model SP-33: 250 gallons.
- 4) Model SP-41: 450 gallons.
- 5) Model SP-49: 620 gallons.
- 6) Model SP-55: 850 gallons.

18. Packaging

- a. For loading and unloading, filter tank diameters 24" – 41" must be bolted to individual wooden pallets. Filter tank diameters 49" and 55" must be equipped with temporary lifting legs. Tanks must be shrink wrapped to prevent damage during transport.
- b. The components must be carefully packaged in a totally enclosed wooden crate to prevent damage during transport.

19. Media

- a. Media must be expanded perlite with a median particle size of 37 microns. The percentage retained on a +150 Tyler Mesh must not be less than 8% or more than 25%. Darcy permeability must be between 1.2-1.85.
- b. The media must contain no more than 1 tenth of one percent (.001) of crystalline silicate.
- c. The media must be certified by the manufacturer for use in the filter. The media must be NSF listed in Standard 61 and Standard 50.
- d. The media must be Harborlite Aquaperl as supplied by World Minerals, Techflo 2000x, or approved equal.
- e. The filter must be provided with six (6) charges of perlite media.

20. Filter Cleaner

- a. The filter must be furnished with one (1) charge of chemicals for cleaning and degreasing of filter tube elements.

21. Quality Assurance

- a. Documented at least three (3) completed installations of the filtration system or a qualified manufacturer's representative is required for on-site installation supervision.

D. Backwash Basin Grating

1. The top of the backwash basin must be provided with Duradek I-6500 series 1.5" fiberglass grating, with a minimum open area of 65% as manufactured by Strongwell or approved equal. Grating sections must be cut to fit in the field to accommodate backwash piping runs from the pool equipment. Grating must be installed in angles around its perimeter and be mounted flush with floor slab and top of basin while anchored with corrosion resistant fasteners.
2. FRP pultruded grating and treads must be manufactured using a pultruded process utilizing phenolic resin with flame retardant and ultraviolet (UV) inhibitor additives. FRP shapes must achieve a flame spread rating of 25 or less in accordance with ASTM test method E-84, the flammability characteristics of UL 94 V0 and the self-extinguishing requirements of ASTM D635.

3. The bearing bars must be joined into panels by passing continuous length fiberglass pultruded cross-rods through the web of each bearing bar. A continuous fiberglass pultruded bar shaped section must be wedged between the two cross rod spacers mechanically locking the notches in the cross-rod spacers to the web of the bearing bars. Continuous adhesive bonding must be achieved between the cross-rod spacers and the bearing web and between the bar shaped wedge and the two cross rod spacers locking the entire panel together to give a panel that resists twist and prevents internal movement of the bearing bars.
4. Design live loads of FRP gratings for walkway applications must be 60 psf (2.87 kN/m²) uniformly distributed load per ASCE 7 or as required by the governing building code with a maximum deflection of 0.25" (6.4mm) at the center of a simple span.
5. Structural support members must not deflect more than L/180 of span for structural members unless specifically stated otherwise in drawings and/or supplementary conditions. Connections must be designed to transfer the design loads.
6. Hold down clamps and connectors must be type 316L stainless steel clips. Use two (2) at each support with a minimum of four (4) per panel. Additional hold downs and support bars must be provided for additional grating support around all holes cut into the grating.
7. Installation
 - a. Provide anchorage devices and fasteners where necessary for securing miscellaneous FRP fabrications to in-place construction; include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts and other connectors.
 - b. Perform cutting, drilling, and fitting required for installation of miscellaneous FRP fabrications. Set FRP fabrication accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; measured from established lines and levels.
 - c. Provide temporary bracing or anchors in form work for items that are to be built into concrete masonry or similar construction.
 - d. Penetrations through grating require additional supports in order to meet design criteria. Contractor to follow manufacturer recommendations for each occurrence.
 - e. All field cut and drilled edges, holes and abrasions must be sealed with a catalyzed resin compatible with the original resin as recommended by the manufacturer.

2.3 PIPING SYSTEMS

A. General

1. Provide recirculating piping between the pool and the filter room, fill receptor and interconnecting piping to and from the chemical feed systems and chemical controller.
2. Provide necessary pipe supports and support systems required to support associated piping and valves.
3. Provide other tubing, conduit, or piping associated with equipment specified herein. Coordinate with other trades.

B. Pipes

1. Pipe routing as shown and detailed on the contract drawings is diagrammatic only and is not intended to show minor details or exact locations of piping systems. Installation is

- required and must be adjusted to accommodate interference and adjustments anticipated and encountered. Pipe sizes on plans refer to the nominal inside diameter of the pipe.
2. PVC swimming pool piping must be NSF approved and conform to the requirements of ASTM D-1785.
 3. PVC pipes must be the product of one manufacturer. Approved manufacturers of PVC piping are Eslon, Harvel, and Chemtrol or approved equal.
 4. Swimming pool piping above the floor or deck in the filter room must be Schedule 80 PVC.
 5. Swimming pool piping below the filter room floor or deck must be NSF approved, Schedule 80 PVC.
 6. Below grade swimming pool piping not located beneath the pool floor can be backfilled with native granular material free of ice, clay, debris, organic matter, and rocks larger than 4" across their greatest dimension, and per recommendations indicated in the project geotechnical report.
 7. The influent and effluent lines to the heaters unit must be CPVC. Connections between metallic piping and/or equipment and PVC must be flanged.
 8. PVC and CPVC fittings must be the product of one manufacturer. Molded fittings must be manufactured by Asahi, Eslon, Chemtrol, Harvel, Spear, Lasco or acceptable substitutes. Fabricated fittings must be manufactured by Harrison Machine, Plastinetics, or acceptable substitute.
 9. Anti-vortex plates must be provided at the suction points of the main recirculation pump(s) in the surge tank(s). Each plate must be connected to the suction pipe via a PVC flange and must be ½ in. thick with minimum dimension of at least 2.5 times the connecting pipe diameter. The plate must be located 4 inches above the finished floor of the surge tank. Four (4) 3/4 in. stainless-steel threaded rods, nuts, anchor bolts and washers must be used to fix the offset distance and provide a secure base for the suction pipe. Manufactured fiberglass or PVC anti-vortex plates by Daldorado, Neptune-Benson or approved equal.
 10. Chemical feed lines from chemical feeders to recirculation piping must be Schedule 80 PVC piping. Piping must be hard piped into the recirculation piping via tee or saddle per the drawings. Required valves must be of PVC construction.
 11. Splash collar(s) for the fill funnel(s) must be clear Schedule 80 PVC and manufactured from a Type I, Grade I PVC compound with a Cell Classification of 12454 per ASTM D1784. The pipe must be manufactured in compliance with ASTM D1785.
 12. Flanged plumbing connection hardware must be stainless-steel.
 13. Materials must be installed by workmen thoroughly skilled in their trades and work must present a neat and mechanical appearance when complete. At no additional expense to the Owner, replace or correct work not judged acceptable by the Architect, Engineer, or Owner's representation.
 14. Support hardware, brackets, fasteners, hangers, etc. furnished and installed in the surge tank must be 316L stainless-steel.
 15. No installation allowed that will provide a cross-connection or interconnection between a distributing supply for drinking purposes and the swimming pool, or between the pool and a sanitary or storm water sewer system that will permit a backflow of water into the pool water system.
 16. Piping must be hydrostatically (water) pressure tested for leaks before and after backfilling to guarantee water tightness. Pneumatic (air) pressure test not allowed.
 17. Provide water seals for watertight penetrations of concrete walls and floor slabs.
 - a. Pump Pit: Link seals must be provided in the sizes and quantities shown on the drawings and installed to provide flexible watertight penetration. Metal parts must be

made of 316L stainless-steel. Links must form a continuous rubber seal that is tightened with a series of stainless-steel bolts to form a watertight seal. Link seals must be manufactured by GPT, Calpico Inc. or an approved equal. Xypex Patch'n Plug or approved equal must be used to seal pipe penetration. Link seals must be installed with either a cored hole or a Century Line pipe sleeve.

- b. Surge Tank: Water seals must be coupling type with a thermo welded or molded flange and the O.D. must be sized to 150% of the O.D. of the pipe. The thermo-welded type must be welded from both sides. Water seals must be located at the centerline of the wall or slab being penetrated prior to placing the concrete to assure a watertight seal. Manufactured fiberglass and PVC water seal fittings by Daldorado, A.S.A. Manufacturing, Aqualogic or approved equal. Link seals are also acceptable with a cored hole or a Century Line pipe sleeve.
 - c. Renovation: For wall penetrations with dry-side access (Mechanical Room/Pipe Tunnel), provide Link Seals with bolt head access from the dry side, Xypex Patch and Plug (on the wet side), Xypex Concentrate and Dry-Plug, and Xypex Megamix II or Non-Shrink Grout.
- 18. Adhere to the applicable provisions in Division 22 - Plumbing, "General Provisions" and "Basic Materials and Methods" for installation of piping system.
 - 19. Mechanical equipment must be connected into the recirculation piping system must be connected utilizing flanged or union connections.
 - 20. Provisions must be made to purge pipes in the system.
 - 21. Concentric reducers must be fiberglass by MerMade Filter, Inc., or equivalent reducers of schedule 80 PVC construction.

C. Pipe Hangers and Supports

- 1. Manufacturer
 - a. Subject to compliance with these specifications, pipe hanger and support systems must be manufactured by Cooper B-line (basis of design), Inc, TOLCO, and Anvil International or approved equal.
- 2. Hangers
 - a. Pipes 2 inches and smaller
 - 1) Adjustable steel clevis hanger, B-Line models B3100 or B3104.
 - 2) Adjustable steel swivel ring (band type) hanger, B-Line model B3170.
 - b. Pipes 2-1/2 inches and larger
 - 1) Adjustable steel clevis hanger, B-Line model B3100.
 - 2) Adjustable steel yoke pipe roll, B-Line model B3114.
- 3. Multiple or Trapeze Hangers
 - a. Trapeze hangers must be constructed from 12-gauge roll formed ASTM A1011 SS, Grade 33 structural steel channel, 1-5/8 by 1-5/8-inch minimum, B-Line B22 strut or stronger as required.

- b. Mount pipes to trapeze with 2-piece pipe straps sized for outside diameter of pipe, B-Line B-2000 series.

4. Wall Supports

- a. Pipes 2-1/2 inches and smaller
 - 1) Steel offset "J" hook hanger, B-Line model B3600.
- b. Pipes 3 inches and larger
 - 1) Welded strut bracket and pipe straps, B-Line models B3064 and B2000 series.
 - 2) Welded steel bracket B-Line model B3066 or B3067 with roller chair or adjustable steel yoke pipe roll. B-Line model B3120 or B3110.

5. Floor Supports

- a. Electroplated carbon steel adjustable pipe saddle and nipple attached to steel base stand sized for pipe elevation. B-Line model B3092 and B3088T or B3090 and B8088. Pipe saddle must be screwed or welded to an appropriate base stand.

6. Vertical Supports

- a. Steel riser clamp sized to outside diameter of pipe, B-Line model B3373.

7. Plastic Pipe Supports

- a. V-Bottom clevis hangers with galvanized 18-gauge continuous support channel, B-Line models B3106 and B3106V, to form a continuous support system for plastic pipes smaller than 1 inch or flexible tubing.
- b. A vented and sloped continuous PVC Schedule 40 pipe no smaller than 1-1/2 inch outside diameter will be used to route flexible tubing with the appropriate pipe supports.

8. Supplementary Structural Supports - Design and fabricate supports using structural quality steel bolted framing materials. Channels must be roll formed, 12-gauge ASTM A1011 SS Grade 33 steel, 1-5/8 inch or greater as required by loading conditions. Submit design for pipe tunnels, pipe galleries etc. for approval. Use clamps and fittings designed for use with the strut system.

D. Hanger Attachments

1. Upper Attachments

- a. Beam Clamps
 - 1) Beam clamps must be used where piping must be suspended from building steel. Clamp type must be selected on the basis of load supported and load configuration.
 - 2) C-Clamps must be locknuts and cup point set screws similar to B-Line model B351L or B3036L. Top flange c-clamps must be used when attaching a hanger

rod to the flange of structural steel, B-Line model B3034 or B3033 or approved equal. Refer to manufacturer's recommendations for set screw torque. Retaining straps must be used to maintain the clamp position on the beam where required.

- 3) Center load beam clamps must be used where specified. The steel clamps must be B-Line models B3050 or B3055. Forged steel beam clamps with cross bolt must be B-Line B3291-B3297 series or approved equal as required to fit beams.

b. Concrete Inserts

- 1) Cast in place spot concrete inserts must be used applicable, either steel or malleable iron body, B-line B2500 or B3014 or approved equal. Spot inserts must allow for lateral adjustment and have means for attachment to forms. Select inserts to suit threaded hanger rods sizes, B-line models N2500 or B3014N series.
- 2) Continuous concrete inserts must be used where applicable. Channels must be 12 gauge, ASTM A1011 Grade 33 structural quality carbon steel, complete with Styrofoam inserts and end caps with nail holes for attachment to forms. The continuous concrete insert must have a load rating of 2,000 lbs/ft. in concrete, B-Line models B22I, 32I, or 52I or approved equal. Select channel nuts suitable for strut and rod sizes.

E. Hanger Accessories

1. Hanger rods must be threaded on both ends or continuously threaded rods of circular cross section. Use adjustable lock nuts at upper attachments and hangers. No wire, chain, or perforated straps are allowed.

F. Hanger Finish

1. Indoor Finishes

- a. Hangers must be zinc plated in accordance with ASTM B633 or must have an electro-deposited green epoxy finish.
- b. Strut channels must be pre-galvanized in accordance with ASTM A653 SS Grade 33 G90 or must have an electro-deposited green epoxy finish.
- c. Zinc Plated hardware is not acceptable for use in chemical rooms.

G. Valves

1. Valves 3 inches and larger must be butterfly type valves, with PVC body, 150# SWP with stainless-steel shaft, PVC or polypropylene disc and replaceable resilient seat bonded to a rigid shaft and guaranteed for bubble tight shutoff from 27-inch vacuum to 150 PSI. Extended neck 2 inches beyond flanges for insulated piping must be provided with handle for manual operation. Valve components must be suitable for swimming pool chlorinated water service. Butterfly valves must be Georg Fischer Type 563, Asahi/America Type SP Pool-Pro, Chemtrol Model-B, Simtech VP series, Colonial Valve 411 Series, or approved equal.
2. Valves smaller than 3 inches must be PVC true union ball valves, full port, three-piece construction, blowout-proof stem, Viton seal with socket end connectors.

3. Check valves must be a quick closing non-slam type, either self-aligning wafer or flanged type, of corrosion resistant materials suitable for use in a swimming pool environment. Provide check valves in accordance with the manufacturer's recommendations. Locate check valves at least 5 pipe diameters from pumps and fittings. Check valves must be Technocheck Corp., model 5050, with epoxy coated cast iron body and bronze swing plates on a stainless-steel spring, Colonial Valve model 601N or 601NP PVC valve with EPDM O-ring and stainless-steel spring or approved equal, for installation between 150 lb. flanges.
4. Modulating float valve in the surge tank(s) must have PVC body and stainless-steel wafer disc. Hardware must be non-corrodible. The float-operated valves must be provided horizontally on the main drain lines in the surge tank(s). A valve must consist of non-corrosion components including shaft, float arm, pins, and floats. Valve must be suitable for mounting on a 125E class standard PVC flange. The float arm leverage weight and pivot lengths must be adjustable to obtain desired ratio of surge tank level change to pool gutter overflow level change. Two floats and a stabilizer required. Valve must be model FV-D XWB (Extra Weight Ball) as manufactured by MerMade Filter, Inc. or approved equal manufactured by Neptune-Benson, EPD, or Fluidtrol Process Technologies, Inc.
5. Submerged valves up to 3 inches must be PVC true union ball valves. Submerged valves over 3 inches must be PVC bodied, wafer type, butterfly valves with stainless-steel handle extensions as required. Valves must be by approved manufacturers listed above. Submerged valves must be provided with stainless-steel connectors. The stem housing extensions must be properly supported and braced.
6. Butterfly type valves 8 inches and larger must be fitted with a watertight gear operator.
7. Valves located 7 feet or greater off the floor must be fitted with a chain operator.
8. Submerged valves, valves buried below grade, or valves not readily accessible, must be provided with a stainless-steel reach rod and handle.
9. Valve hardware must be 316L stainless-steel and meet ANSI hardware installation guidelines.

H. Pipe and Valve Identification

1. Exposed pool piping must be equipped with color coded flow directional arrows at thirty (30) inch intervals per local and state swimming pool health code. Verify that pool piping identification is in accordance with local and state health regulations.
2. Valves must be identified with minimum 1-1/2-inch diameter plastic laminate engraved tags with minimum 1/2-inch-high numbers. Tags must be fastened to valves with a nylon attachment (zip tie). Valves must be described as to their function and referenced in the operating instruction manual and wall mounted piping diagram that must be prepared.

2.4 CHEMICAL TREATMENT SYSTEMS

A. Sodium Hypochlorite (Liquid Chlorine)

1. Chemical feeders for chlorine must be peristaltic type pumps. Chemical feed pump(s) must be provided and connected to the filtered water return lines to the pool as shown on the pool plans. The pump(s) must be capable of feeding a solution to the pool to maintain chlorine (12% sodium hypochlorite) level against the back pressure involved and must be fully adjustable while in operation.
2. Chemical feeders must be manufactured by LMI, ProMinent, G. H. Stenner & Co., or approved equal.

3. The pump(s) must be provided complete with fractional horsepower motor for 120V, 60 Hz current, plastic feed lines, and fitting necessary for connections to the pool system piping.
4. Chemical pumps must be electrically connected to and operated by the water chemistry controllers.
5. The chemical pump(s) must be affixed with a metallic stamped label indicating the chemical being pumped and the pool to which it is connected.
6. Wall mount or provide non-metallic shelf support for the chemical feed pump(s).
7. Feeder systems must be provided with a check valve at the point of injection into the pool recirculation system.
8. Provide "Vapor Shield" vent check valve for the bulk tank which seals container while allowing the liquid to remove via pump. The Vapor-Shield must prevent an internal vacuum and collapse of a sealed container. It will also prevent the pump from developing a vacuum-lock while attempting to remove the liquid from the sealed container. The Vapor-Shield must prevent the release of chlorine vapors. The Vapor-Shield body must be constructed entirely from schedule 80 PVC with polypropylene tube fittings and factory-installed chlorine resistant viton sealant on threaded connections. The diaphragm and O-rings must be constructed of chlorine resistant viton. No metallic or materials not rated appropriate for use with chlorine must be used. The Vapor-Shield must be fitted with a $\frac{3}{4}$ " male NPT threaded fitting to allow for the installation onto a threaded bulkhead fitting located at the top of the bulk chlorine tank. The unit must be supplied with no less than fifteen (15) feet of polyethylene tubing. Vapor shield chlorine vent must be Recreonics #52-095 or approved equal. An Acid Fume Scrubber, part #7747090, with refill reagent kit, #7747091, manufactured by ProMinent is an equal.
9. Bulk Chlorine Tank
 - a. Provide three (3) 200-gallon bulk chlorine solution tank in the chlorine room as shown on the drawings. The tank must be a double wall bulk tank constructed of polyethylene rigid support with top manway and vent. Tank must be 41" outside diameter by 52" high. The manufacturer must be Chemtainer, Industries, TC4152DC or approved equal.
 - b. The bulk chlorine tank must be provided with fittings for remote fill piping and venting as shown on the drawings. Coordinate fitting locations at the top of the tank with manufacturer prior to ordering. Field cutting tank for additional piping penetrations will not be accepted.

2.5 WATER CHEMISTRY MONITORING AND CONTROL SYSTEMS

- A. A programmable pool chemical automation system must be provided for continuous monitoring and control of the pool water chemistry and related disinfection equipment. The installation of the system must be per the manufacturer's specification. A factory trained/authorized representative must provide training to the Owner and the training must be video recorded. Water chemistry controllers must be provided by ProMinent Fluid Controls, BECS Technology, SB Control Systems, or a technically equal system capable of providing equal performance for operating functions.
 1. The water chemistry control systems for the pool must feature and be capable of the following. Water chemistry controllers without these capabilities and features are not considered equal. Water chemistry control system requirements are based upon the following products: ProMinent DCM513, BECSys5, Chemtrol 3000.

- a. Continuous, real-time monitoring and control of pH and ORP.
- b. Free chlorine in PPM, system flow rate, water chemistry balance calculations, water temperature, and other readings and control as deemed necessary for the project per this section.
- c. The controller must manage the recirculation pump with a programmable Fireman Cycle feature, which automatically turns off the Heater and Auxiliary systems prior to shutting off the recirculation pump.
- d. Management of the recirculation pump on/off status.
- e. The utilization of simultaneous ORP and PPM (bracketing) control for managing both the quantity and quality of the sanitizer/oxidizer. Controllers that do not have the ability to control simultaneously to ORP and PPM control points or that utilize an alternate chlorine set point or boost function will not be considered equal.
- f. Actuating outputs in the following operator selectable modes: off, manual, automatic, proportional and must have a manual on fail-safe timer to ensure that if the controller is left in manual mode, the controller will revert back to automatic mode to prevent an over-feed event.
- g. Programmable events can be time set to occur daily, weekly, or monthly.
- h. Remote monitoring of the recirculation flow rate of the system when installed with compatible magmeters.
- i. Provide use of flow signal as a supplemental chemical feed interlock to prevent the dosing of chemicals during a system low flow/no flow condition.
- j. The controller must continuously monitor data-log while being monitored and control via two-way remote communication.
- k. The controller must continuously calculate and display the Langelier Saturation Index and Ryznar Index using either sensor data and/or manual input for pH, temperature, total alkalinity, and calcium hardness.
- l. Programmable high and low alarm levels for control functions with operator-selectable feed lockout and alarm buzzer options.
- m. Performance and Certifications
 - 1) The controller system must be NSF/ANSI 50 listed for automatic controller equipment for swimming pools, spas, and other recreational water facilities.
 - 2) The controller system must be certified to UL61010/IEC61010, standards.
- n. The controller must automatically activate the appropriate chemical feeders in order to maintain the sanitizer/oxidizer level:
 - 1) Within +/- 0.1 parts per million (PPM) or +/- 10 mV (millivolts) of oxidation reduction potential (ORP)
 - 2) The pH within +/- 0.1 pH unit of the set points selected by the operator.
 - 3) Set point and calibration levels must be adjustable with a keypad mounted on the front panel of the unit as well as the remote interface.
 - 4) The controller must use pH sensor with +/- 0.04 accuracy in the operational range of 6.8 – 8.2 as certified by NSF.
 - 5) An ORP sensor with an accuracy of +/- 3% mV as certified by NSF.
 - 6) A free chlorine sensor that operates in a range of 0.1 parts per million (PPM) up to 10.0 parts per million (PPM) within a 9% accuracy as tested by NSF or another third-party certifying agency.
- o. System Supply

- 1) The controller must be factory supplied with:
 - a) ORP, pH, temperature, and free chlorine sensors.
 - b) Provide cyanuric acid and/or hydrogen resistant free chlorine sensors available for specific application use with stabilized water or saline pools.
 - c) A flowrate sensor to measure system flowrate.

p. Hardware

- 1) The controller must have:
 - a) A minimum of seven (7) fully configurable digital inputs.
 - b) A minimum of four (4) fully assignable digital outputs.
 - c) A minimum of nine (9) configurable analog inputs.
 - d) A minimum of five (5), 115 VAC fully assignable relays.
 - e) The controller must be capable of expanded capabilities with an optional input/output expansion card kit.
 - f) High voltage field wiring must be through a separate NEMA 4X factory engineered and supplied enclosure that precludes direct access to controller electronics. High voltage connections must be clearly identified, and a field wiring diagram must be provided with the controller for the Contractor's reference. Controller high-voltage relay assignment parameters must be programmed at the factory prior to delivery to installation location.
 - g) The controller must include a sensing flow cell that is hydraulically designed to allow verified correct flow and consistent pressure across sensors. Flow cell will be clear PVC that is modular in concept and have the flexibility to add supplementary water chemistry sensors as desired. The sensing flow cell must include a safety flow switch sensor, water spigot, and isolation valves.

q. Communications

- 1) The controller must have as a standard feature:
 - a) The controller must include the capability of ethernet connection and secondary wireless communication.
 - b) The controller must allow full two-way remote communication and full control of parameters.
 - c) Accessibility with a standard internet browser using a fully interactive Ethernet TCP/IP graphical interface that includes security access codes.
 - d) Real-time monitor/control with real-time auto polling, data logging, email and text alarms and providing both graphical and report formats via a personal computer, smartphone, or tablet device.
 - e) The controller must have the ability to facilitate email or text alarm notifications, historical graphing, and real-time control via a personal computer, smartphone, or tablet device.
 - f) The controller must have the ability to export a .csv file once per day with reading type, time, and reading. The export must be done via email and must include the controller serial number. Export data must include ORP, Free Available Chlorine, pH, and Temperature.

- g) The controller must have the ability to allow software upgrades and programming as needed in the field.

r. Commissioning and Manuals

- 1) The control system must be provided with on-site start-up operator training performed by a representative trained and authorized by the controller manufacturer.
- 2) The manufacturer must supply an operation and maintenance manual describing features, operating instructions, maintenance procedures and replacement parts.
- 3) Installation of the system must be per the manufacturer's specification and no exceptions must be allowed. A factory trained/authorized representative must provide training to the owner and the training must be video recorded.

2.6 FLOW METERS

- A. Recirculation flow meter (1 required) must be provided according to the manufacturer in the filtered water return lines to each of the pool. The flow sensor must be the GF Signet 2551 insertion magmeter. Provide the coaxial cable from the sensor to the display/transmitter. Flow meter accuracy must be +/- 2% of reading.
- B. Refill flow meter (1 required) must be provided on dilution piping to backwash tank. Flow meter must be one-piece meter body of injected molded polysulfone adapters, viton o-ring seals, and 316L stainless-steel floats and float guide, impact resistant machined acrylic plastic body. GPM scale must be permanently etched or imprinted on the meter. Flow rate indicator must be of stainless-steel material. The scale range must be appropriate for a specific flow rate. The manufacturer must be BLUE-WHITE model #F-45750L-12, 3/4" M/NPT @ 1.0 to 10.0 GPM or approved equal.

2.7 WATER LEVEL CONTROLLERS

A. In Surge Tank Water Level Controller

1. Provide a water level sensing and control system for the pool that will monitor the water level in the surge tank and automatically activate the auto water make-up control valve. For sensing water level and activating make-up water control valve for the pool, use Series ELC-810 controller housed in a watertight NEMA 4X UL94 5V UL flammability rated polycarbonate enclosure to meet IP66 and NEMA 4, 4X, 12 and 13 ratings. The controller must utilize one sensor to control water level. ELC-810 series must have a menu-driven LCD display screen and utilize a five-switch user interface for navigation through the menu. The menu must allow changing the following settings: delay to shutoff, alternate sensor option, maximum time on, manual override, delay to normal, type of sensor, high level option, flow sensor active, and sounder with alarm. Menu settings must be capable of password protection. The controller must be capable of displaying the following data: last fill time, last drain time, last alarm. The controller must be capable of determining the following: maximum time on exceeded, over current to solenoid valve, no valve/valve wiring problem, and sensor not working properly. The controller must have a low voltage interlock with auto water make-up solenoid valve and must provide adjustable time delay for

increasing level and manual override. The controller must require 115 VAC, 1 phase, 60 Hz power. The water level control package must be manufactured by AquatiControl Technology, model ELC-810-SS-ST-XXX (Coordinate the specific length(s) of cable required for each controller prior to ordering). Refer to drawings for additional information.

2. Provide one proximity switch sensor(s) that must be sensitive to within +/- 1/8" (4mm) of nominal water level. Supply voltage to sensor must be 12V to 24V DC from controller. Current consumption must be < or = 15mA. Response frequency must be 100Hz. Maximum control output must be 200mA. The sensor operating temperature must be -25 Deg. C to 70 Deg. C. Operating humidity must range from 0% RH to 95% RH. The sensor(s) must be mounted in a 1" Schedule 80 PVC pipe (length must be determined by depth of surge tank). Sensing pipe must be mounted to surge tank wall with composite/non-metallic hangers and stainless-steel hardware. Sensing pipe(s) must be capable of being submerged under water safely. Refer to drawings for additional information.
3. Wiring from the sensor to the controller must be provided and must be connected to the terminal points mounted within a corrosion resistant, nonmetallic NEMA 4X enclosure. Wiring connections must be made through the bottom of the enclosure. The enclosure size must be no less than 8" wide x 5" high x 4" deep. The access door must be the entire front face panel of the enclosure. Confirm location in field.
4. Major components must be plugged-in using WAGO terminal blocks for ease of installation and replacement. Unit must be designed to activate a 24-volt AC solenoid valve.
5. Provide a make-up water solenoid valve, normally closed, stainless-steel fitted, bronze body, 24 VAC slow-closing type. Size to pipe. Interlock with automatic water level control system. Refer to the drawings for additional information. Solenoid must be by ASCO or approved equal.
6. Discharge of make-up water must be into a fill funnel and piping to the pool. Refer to the drawings for additional information.

2.8 SURGE TANK ACCESSORIES

- A. Surge tank access hatch (1 required) must be provided as shown on the drawings. The access hatch must be a single door 3'-2" x 2'-6" with 1" fillable pan to receive ceramic tile and grout or concrete fill to match the surrounding deck. The frame must be 1/4 inch extruded aluminum with built in neoprene cushion and continuous anchor flange. Door must be 1/4" aluminum plate reinforced with aluminum stiffeners as required. The door must be equipped with heavy continuous stainless-steel hinges and must have compression spring operators for easy operation. The door must open to 90 degrees and lock automatically in that position. The door must be built to withstand a live load of 150 lbs. per square foot and equipped with a continuous Type 316L stainless-steel hinge, tubular type, and an automatic hold open arm with release handle. Hardware must be type 316L, 18-8, stainless-steel. A flush lift handle and a snap lock with removable key wrench must be provided. Factory finish must be mill finish with bituminous coating applied to the exterior of the frame. The access door must be Type TER-3 single leaf pan type door as manufactured by the Bilco Company.
- B. Sleeves for surge tank valve extensions must be Spectrum Products Valve Extension Body #1910387 with Lid and Key #36450, or Spectrum Products Bronze Anchor Kit 1.90-inch O.D. x 6-inch-deep Anchor (field modification required) with Lid and Key #23638-00.
- C. Surge tank ladder must be provided for the depth of the surge tank as indicated on the drawings and include a pull-up handrail. The ladder and handrail must be constructed of polypropylene that

conforms to ASTM-D4101. Ladders must meet all ASTM0C-497 load requirements and OSHA 1910.26 and 1910.27 specifications. The ladder must be fastened to the floor and wall with 1/2" x 3-3/4" 316 stainless-steel anchors and installed per manufacturer's instructions. Adjustable mounting bracket must be 8". Aluminum reinforced copolymer polypropylene rail must be 1-3/4" x 1-3/4" diameter. Steel reinforced copolymer polypropylene ladder rungs must be 1-5/8" x 1-1/4" diameter with molded finger grips, 12" O.C. The ladder must be manufactured by Lane International Corporation or approved equal.

2.9 WATERPROOFING

A. Products

1. Interior surfaces of surge tank and backwash pit with NO additional finishes: Apply two (2) coats of Vandex BB White, Xypex Modified, Xypex Megamix I, Miracote BC Pro or Basecrete directly to surface of surge tank and backwash pit.

B. Surface Preparation

1. Surface must be structurally sound and free of foreign substances and debris that could reduce or impair adhesion. Surfaces must be roughened by sand blasting or water blasting. Shot blasting, scarifying, or grinding can also be accepted methods of surface preparation. Surface defects or holes must be patched per manufacturer's recommendations.

a. National Plasterers Council Surface Preparation Definitions

- 1) Pressure Washing: The washing or cleaning of a surface by a stream of water ejected from a nozzle at high velocity, typically in the range of 1,000 psi – 4,000 psi.
- 2) Water Blasting: The cutting, abrading, or removal of a surface or substrate by a stream of water ejected from a nozzle at ultra-high velocity, typically in the range of 10,000 psi – 40,000 psi.

C. Application

1. Do not apply materials under conditions where the ambient air temperature is less than 40 degrees Fahrenheit, or to a frozen substrate.
2. The mixing of products, quantities and application procedures must be done in accordance with the manufacturer's recommendations.

2.10 SEALANTS

A. Provide sealed expansion joints as shown on the pool and pool structural drawings or noted on the construction/expansion joint layout, and as required. Expansion joints must be constructed and sealed as indicated and in accordance with the manufacturer's recommendation. Sealant must be manufactured by LATICRETE International, Inc., Mapei, or Deck-O-Seal.

1. For submerged joints:

- a. Latasil, one component, neutral cure, high performance, 100% silicone sealant in the color(s) as selected by the Owner/Architect. Must be used in conjunction with Latasil 9118 Primer per manufacturer's recommendations.
 - b. Mapesil T, 100% silicone sealant in the color(s) as selected by the Owner/Architect.
2. For joints behind the coping, or other horizontal deck joints:
 - a. Deck-O-Seal, two component (gun-grade or pourable, self-leveling), high resilience, non-sag, non-flowing, polysulfide-based sealing compound in the color(s) as selected by the Owner/Architect. Must be used in conjunction with Rezi-Weld LV per manufacturer's recommendations.
- B. Material Storage
1. Materials must be stored in the original unopened factory containers in a cool dry location at 60 to 80 degrees F. Protect from the elements and the hazards of construction.
- C. Joint Preparation
1. Clean the joints of deleterious material, to sound, clean and dry substrate.
 2. Joint must be formed or filled with an approved, resilient, non-asphaltic, closed cell, polyethylene joint filler material down to firm substrate. Allow space at the top of the joint for the installation of approved closed cell polyethylene backer rod and install same to the required depth below the surface of the slab to control the depth of the sealant bead to within manufacturer requirements.
- D. Surface Preparation
1. Concrete surfaces to receive sealant must be fully cured, clean, dry, and free of dirt, dust, curing compounds and other foreign material that might compromise the adhesion and performance of the sealant. Curing aids, form release agents and joint former residue must be completely removed, if necessary, by sand blasting and/or grinding. Loose dust must be brushed off.
 2. Prime surfaces to receive Latasil sealant with Latasil 9118 Primer prior to sealant application, and surfaces to receive Deck-O-Seal sealant with P/G Primer prior to application.
- E. Application
1. Apply sealant in accordance with the manufacturer's recommendations.
 2. Tool the joint immediately after application to ensure a firm, intimate contact with the joint interface.
 3. Remove excess sealant and smear from adjacent surfaces with Xylol or Toluol before sealant cures.
 4. After the sealant has fully cured (generally a minimum period of five days at 72 degrees and 50% humidity), paint the surface of the sealant with a chlorine resistant chlorinated rubber or equivalent pool paint, in a compatible color as selected by the Owner/Architect. NOTE: Latasil cannot be painted.

PART 3 - EXECUTION**3.1 EXISTING CONDITIONS, INSPECTION AND PREPARATION**

- A. Carefully examine the contract documents for requirements that affect the work of this section. Prior to starting work, notify the Architect of defects requiring correction. Do not start work until conditions are satisfactory.
- B. Verify that work by others, related to this section, has been completed. This includes earthwork, concrete work, and mechanical, electrical, and plumbing connections.
- C. Protect materials and work completed by others from damage while completing the work in this section.

3.2 FIELD MEASUREMENTS

- A. Verify benchmark and pool location prior to layout.
- B. If field measurements differ from the construction drawing dimensions, notification must be given to the Architect prior to proceeding with work.

3.3 EXCAVATION, REINFORCING STEEL AND SWIMMING POOL

- A. Reference Division 31 - Earthwork
- B. Reference Division 3 - Concrete

3.4 TOLERANCES FOR CONSTRUCTION OF THE POOL SHELL

- A. The completed structures must be constructed level and to the dimensions, elevation, depths, and thickness as shown on the plans.
- B. Ground wires or grade pins, if used, must be installed in such a manner that they accurately outline the section of the pool shell as indicated on the plans. They must be located at intervals sufficient to ensure proper thickness throughout and must be maintained tight. Grade pins or grounding wires must not be permanently embedded in the pool shell.

3.5 WATER TIGHTNESS TEST

- A. The water tightness test described within the following section is in accordance with the Hydrostatic Tightness Testing of an Open Concrete Containment Structure as required by American Concrete Institute (ACI) 350.1-10 Section 2. Test reports must be provided and must include test locations within the structure, dates of testing, water level measurements, amounts of evaporation or precipitation, measured volume corrections, retest results (if applicable), actions taken, and final results.

- B. This test applies to the surge tank. The water tightness test must be completed prior to the application of the finishes.
- C. Water Tightness Test Procedure
 - 1. Preparation
 - a. For surge tanks: Allow the concrete structure to set 28 days for curing purposes. Once the shell has gained sufficient strength to withstand the test load and after the outlets have been securely sealed, the surge tank must be filled with water.
 - 2. Fill: Fill and then isolate the surge tank. The water tightness test must begin after the vessel has been filled for a minimum of three (3) days. During the filling, outlets must be monitored for water tightness and concrete joints, if applicable, must be monitored for visible leakage. If visible leakage from the vessel is observed, the condition must be corrected prior to the start of the test.
 - a. After the initial fill, ground water must be removed from the pool sight sump or the pool location de-watering system. This must be completed prior to the start of the water tightness test. De-watering of the pool sight sump must be maintained during the entire duration of the test.
- 3. 24-hour Allowable Loss
 - a. Calculate the allowable water loss from the unlined vessel(s). This is .1% of the total vessel volume. For example, if the vessel has a volume of 200,000 gallons, the 24-hour allowable loss will be 200 gallons.

Vessel	Total Volume (Gallons)	24-hour Allowable loss (.1% or .001 of Total Volume)
EXAMPLE	200,000 gal	200 gal
Surge Tank		

- 4. Measurement
 - a. Measurements must be taken at the surge tank. Multiple test points with averaging are recommended for vessels which will be exposed to wind. Document the separate findings on the chart below. Repeat the measurements and document every 12 hours for a total of three (3) days. The Contractor must check the surge tank for water loss with the Owner or a representative designated by the Owner every 12 hours. Submit photo documentation (with time stamps) of each measurement with the completed water tightness report. Example measurements are shown in the table below.

- 5. Evaporation/Precipitation Measurement Procedure
 - a. Fill a floating, restrained, partially filled, calibrated, open pan with water and allow the container to float within the pool during the testing period. This will be used to measure evaporation and precipitation.

Vessel	12 hrs. passed	24 hrs. passed	Day 1 TOTAL	36 hrs. passed	48 hrs. passed	Day 2 TOTAL	60 hrs. passed	72 hrs. passed	Day 3 TOTAL

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Example Pool	0.021 ft	0.010 ft	0.031 ft	0.016 ft	0.019 ft	0.035 ft	0.022 ft	0.017 ft	0.039 ft
Example Pan	0.008 ft	0.006 ft	0.014 ft	0.008 ft	0.007 ft	0.015 ft	0.009 ft	0.007 ft	0.016 ft
Surge Tank									
Evaporation/ Precipitation Pan									

6. Calculate Daily Loss

- a. Calculate the total daily water loss for the vessel(s) and record in the table below. If a vessel has a daily water loss that is greater than the calculated 24-hour allowable loss, the vessel cannot be considered watertight.
- 1) Daily Loss = $7.481 \times \text{Structure Surface Area (SF)} \times [\text{Total Water Loss per Day (FT)} - \text{Evaporation per Day (FT)} + \text{Precipitation per Day (FT)}]$
- b. For example, we have a body of water that is 200,000-gallon volume and 3,500 square feet of surface area. Measurements for this example body of water are recorded in the table above.
- 1) Day 1 Loss = $(7.481 \text{ gallons per cubic foot}) \times (3,500 \text{ SF}) \times [(.031 \text{ ft water loss}) - (.014 \text{ ft evaporation}) + (0 \text{ ft precipitation})] = \underline{445 \text{ gallons Day 1 loss}}$
 - 2) Day 2 Loss = $(7.481 \text{ gallons per cubic foot}) \times (3,500 \text{ SF}) \times [(.035 \text{ ft water loss}) - (.015 \text{ ft evaporation}) + (0 \text{ ft precipitation})] = \underline{524 \text{ gallons Day 2 loss}}$
 - 3) Day 3 Loss = $(7.481 \text{ gallons per cubic foot}) \times (3,500 \text{ SF}) \times [(.039 \text{ ft water loss}) - (.016 \text{ ft evaporation}) + (0 \text{ ft precipitation})] = \underline{602 \text{ gallons Day 3 loss}}$

Vessel	Daily Water Loss Day 1 (Gal)	Daily Water Loss Day 2 (Gal)	Daily Water Loss Day 3 (Gal)	Allowable Loss (calculated above, Gal)	Are daily values higher than the Allowable Loss? (Y/N)
EXAMPLE	445 gal	524 gal	602 gal	200 gal	Y, not watertight
Surge Tank					

7. Absorption

- a. Waiting 3 days after the initial water fill will allow the concrete to absorb water and must be sufficient to minimize the effect of absorption on the test results.

8. Evaporation

- a. Evaporation must not have a significant effect on natatoria that are completely enclosed with no air circulation during the water tightness test. However, evaporation will have a significant effect on the water level in natatoria that has air movement across the water surface or are still partially uncovered.

9. If leaks are detected, repair the vessel, and make watertight in accordance with these requirements.
10. With regard to this test, the curing requirements, the final fill, and the cost of the water for two (2) complete fillings must be borne by the Owner. Expenses for subsequent fillings or partial fillings (more than 25%) of the pool must be provided and will not be borne by the Owner.

3.6 PIPING INSTALLATION

A. General

1. Provide and erect, according to the best practices of the trade, piping shown on the drawings and required for the complete installation of these systems. The piping shown on the drawings must be considered as diagrammatic in indicating the general run and connections and may or may not in parts be shown in its true position. The piping may have to be offset, lowered, or raised as required or as directed at the site. This does not relieve responsibility for the proper erection of the systems or piping in every respect suitable for the work intended as described in the specifications and approved by the Architect. In the erection of piping, it must be properly supported, and proper provisions must be made for expansion, contraction and anchoring of piping. Piping must be cut accurately for fabrication to measurements established at the construction site. Pipe must be worked into place without springing and/or forcing, properly clearing windows, doors, and other openings and equipment. Cutting or other weakening of the building structure to facilitate installation will not be permitted. Pipes must have burrs and/or cutting slag removed by reaming or other cleaning methods in strict accordance with the manufacturer's instructions. Changes in direction must be made with fittings. Open ends of pipes and equipment must be properly capped or plugged to keep dirt and other foreign materials out of the systems. Plugs of rags, wool, cotton waste or similar materials will not be used in plugging. Piping must be arranged so as not to interfere with removal and maintenance of equipment, filters, or devices, and so as not to block access to manholes, access openings, etc. Flanges or unions applicable for the type of piping specified must be provided in the piping at connections to items of equipment. Piping must be installed to ensure noiseless circulation. Valves and specialties must be so placed to permit easy operation and access.

B. Pipe Hangers and Supports

1. Pipes must be adequately supported by pipe hangers and supports as specified.
2. Horizontal PVC Schedule 80 piping must be supported in accordance with the manufacturer's recommendations for fluid temperature not exceeding 120-degree F and as listed below:

Nominal Pipe Size	Hanger Support Spacing	Minimum Rod Size for Single Rod Hanger
1-1/4" and less	5'-0"	3/8"
1-1/2" to 3"	6'-0"	1/2"
4" to 6"	8'-0"	5/8"
8" to 12"	10'-0"	7/8"
Greater than 12"	12'-0"	1"

3. Horizontal CPVC Schedule 80 piping must be supported in accordance with the manufacturer's recommendations for fluid temperature not exceeding 140-degree F and as listed below:

Nominal Pipe Size	Hanger Support Spacing	Minimum Rod Size for Single Rod Hanger
1/2" and less *	4'-0"	3/8"
3/4" to 2"	6'-0"	3/8"
2-1/2" to 3"	7'-0"	1/2"
4" to 8"	8'-0"	7/8"
Greater than 12"	10'-0"	1"

4. Round rods supporting the pipe hangers must be of the following dimensions:

Nominal Pipe Size	Rod Diameter
1/2" to 2" pipe	-3/8" rod
2-1/2" to 3" pipe	-1/2" rod
4" to 5" pipe	-5/8" rod
6" pipe	-3/4" rod

5. Hanger rods must be galvanized steel. Provide for controlling level and slope by turn buckles or other approved means of adjustment and incorporate lock nuts.
6. Provide means of preventing dissimilar metal contact such as plastic-coated hangers, copper colored epoxy paint, or non-adhesive isolation tape.
7. Provide hangers to provide a minimum of 1-inch space between finished covering and adjacent work.
8. Place a hanger within 12 inches of each horizontal elbow.
9. Support vertical piping independently of connected horizontal piping. Support vertical pipes at every floor. Wherever possible, locate riser clamps directly below pipe couplings or shear lugs.
10. Where several pipes can be installed in parallel and at the same elevation, provide trapeze hangers as specified. Trapeze hangers must be spaced according to the smallest pipe size or provide intermediate supports according to the support spacing schedules. Provide heavier members as required for the load supported for the entire span distance. Hanger rods must be as specified above and properly sized for the load supported, but not less than 5/8 inches diameter.
11. Piping must be rigidly supported from the building structure by means of hanger assemblies properly selected and sized for the application in accordance with the manufacturer's recommendations and specifications. Do not support piping from other pipes, ductwork or other equipment that is not building structure. Do not modify the building structure for hanger installation.
12. Attachment of piping hangers to the building structure must be provided in a manner approved by the Architect. Provide concrete inserts installed by others in the building construction at the time the concrete is poured, and hangers must be attached to these inserts.
13. The use of pipe hooks, chains, or perforated iron for pipe hanger supports will not be permitted.
14. A design for piping in a service tunnel, if required, supported by a structure must be submitted for approval. The structure must be non-corrodible and must be of a size and configuration to rigidly support the piping as shown in the plans at a minimum spacing as shown below.

C. Concrete Inserts

1. Provide inserts for placement in form work before concrete is poured.
2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
3. Where concrete slabs form finished ceilings, inserts must be flush with the slab surface.
4. Provide hook rods to concrete reinforcement section for inserts carrying pipe over 4 inches.

D. Piping Installation – Below Grade

1. Trench bottoms must be smooth and free of rocks and debris. If the trench is dug in ledge rock, hardpan or where large boulders are not removed, place 3 inches of sand or compacted fine-grained soil below the pipe. Pipe must be supported over its entire length with firm, stable material. Blocking will not be used to change pipe grade or provide intermittent support over low sections in the trench. Surround the pipe with backfill meeting the requirements of Section 312000 with a particle size of 1-1/2 inch or less and in accordance with the project geotechnical report. Compact in layers not to exceed 6 inches with vibratory method. Follow installation methods of ASTM D2774 "Underground Installation of Thermoplastic Pressure Piping".

E. Flushing, Draining and Cleaning Pipe Systems

1. Flush out water systems with water before placing them in operation. Other systems must be cleaned by using compressed air or nitrogen. After systems are in operation and during the test period, strainer screens must be removed and thoroughly cleaned.

F. Expansion and Contraction

1. Make necessary provisions for expansion and contraction of piping with offsets, loops, flexible connections, and anchors as required to prevent undue strain. Provide shop drawings for method and arrangement for control of expansion and contraction of piping.

G. Testing

1. Piping installation and pressure testing must be performed by the Contractor and reviewed by the Owner or a designated representative of the Owner before commencement of backfilling. A minimum notice of one (1) week is required prior to review. Results must be submitted to the Architect. Pictures with time stamps for each section of piping must be included with testing report(s) and be submitted within one (1) week of the pressure test(s).
2. Pool related piping must be hydraulically pressure tested (with water, not air) to a pressure of not less than 50 PSI for a period of no less than two (2) hours. Pressure testing must be conducted in accordance with ASTM D2774. The temperature of the water used for the test must be between 40°F and 90 °F.
3. Maintain a sustained 20 PSI pressure on pool related piping throughout the course of construction.
4. Adhere to the applicable provisions of Division 22 - Plumbing, "General Provisions" and "Basic Materials and Methods" for installation of piping system.

3.7 EQUIPMENT AND SYSTEMS INSTALLATION

- A. Provide and assemble equipment, special parts and accessories as shown on pool drawings, specifications, and shop drawings of the equipment suppliers.
- B. Provide anchors and inserts imbedded in the deck including fittings, inserts and structure sleeves and required anchorage as shown on the plans and as indicated in this section of the specifications. Equipment must be set true and plumb, using factory jigs where available. Removable equipment items must be easily removable from anchors and must fit without noticeable wobble.
- C. Provide templates for equipment anchors. Provide anchor bolts of the size and spacing as required by the equipment manufacturer. Anchor bolts must be stainless-steel Type 316L and of a length capable of adequate anchorage into rough slab-on-grade allowing for finish deck tile and setting bed. Anchors must be set and cast into place during building concrete work. Inspect anchor settings for horizontal and vertical alignment prior to placing concrete.
- D. Provide equipment and systems in accordance with manufacturer's directions. Equipment must be assembled and in place for final observation.
- E. Items necessary to complete this section are shown on the plans or described in the specifications including items that may be purchased by the Owner. Items are detailed and specified as a guide for dimensional purposes. Make provisions accordingly and submit shop drawings and submittals based on that data.

3.8 START-UP AND INSTRUCTION

- A. Supply the services of an experienced swimming pool operator/instructor for a period of not less than two days (total 16 hours) after the pool has have been filled and initially placed in operation. During this period, the Owner's representatives who will be operating the pool must be thoroughly instructed in phases of the pool's operation. Deliver six (6) complete sets of operating and maintenance instructions for the swimming pool, structures, finishes and component equipment. Prior to leaving the job, obtain written certification from the designated Owner's representative acknowledging that the instruction period has been completed and necessary operating information provided. Include the cost of two (2) additional days (total 16 hours) of instruction and operational check out by the qualified representative during the first season of operation.
- B. Written reports of each of these visits outlining the pool's operation, competence and performance of the pool's operation personnel, and other pertinent comments must be submitted to the Owner and Architect/Engineer within one (1) week after each visit.
- C. Provide specific written procedures that must be followed for emptying and refilling the pool as mentioned previously in this section. The procedures must be included in the bound volume of operating instructions and references in the front index with a note headed by the words: "CAUTION -- VERY IMPORTANT".

END OF SECTION 131100

