

MINER'S PARK RESTROOM  
MUNICIPALITY OF BETHEL PARK  
ALLEGHENY COUNTY, PENNSYLVANIA

C-90049-B001

**Contract No. 1 - Base Bid - General Construction**

This project involves improvements to an existing municipal park, including, but not limited to, clearing and grubbing; existing site feature demolition; unclassified bulk excavation; erosion and sediment control measures; storm sewer installation; concrete paving; construction of a new restroom building; site feature protection; and associated landscaping and plantings, complete in place.

**Contract No. 2 – Base Bid - Electrical Construction**

This project involves electrical construction for a new restroom building including, but not limited to, site and building electrical construction, complete in place.

**Contract No. 3 – Base Bid - Plumbing Construction**

This project involves plumbing construction for a new restroom building including, but not limited to, site and building plumbing construction, complete in place.

**Contract No. 4 – Base Bid - Mechanical Construction**

This project involves mechanical construction for a new restroom building including, but not limited to, building mechanical construction, complete in place.

**Mandatory Pre-Bid Meeting:** July 8, 2025, 11:00 a.m. at Miner's Park (5440 Main Street)

**Bid Opening Date:** July 22, 2025 Via PennBid

**Bid Opening Time:** 11:00 a.m.

**PREPARED FOR**

Municipality of Bethel Park  
5100 West Library Avenue  
Bethel Park, PA 15102

**PREPARED BY**

The Gateway Engineers, Inc.  
100 McMorris Road  
Pittsburgh, PA 15205  
412.921.4030 PHONE

[www.gatewayengineers.com](http://www.gatewayengineers.com)



A FULL-SERVICE CIVIL ENGINEERING FIRM  
OUR HERITAGE. YOUR FUTURE.

## Project Directory

|                                      |                                                                                                                                           |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| OWNER:                               | Municipality of Bethel Park<br>Kristen Denne, Municipal Manager<br>5100 West Library Road<br>Bethel Park, PA 15102<br>Phone: 412-831-6800 |
| ENGINEER:                            | The Gateway Engineers, Inc.<br>Scott Baker, Project Manager<br>100 McMorris Road<br>Pittsburgh, PA 15205<br>Phone: 412-921-4030           |
| ELECTRICAL ENGINEER:                 | Sulosky Design Group, LLC<br>Steve Sulosky, P.E.<br>830 Wildcat Way<br>Latrobe, PA 15650<br>Phone: 814-659-6375                           |
| MECHANICAL AND<br>PLUMBING ENGINEER: | Andelmo Engineering<br>Don Andelmo, P.E.<br>11980 Lee Drive<br>North Huntingdon, PA 15642<br>Phone: 724-861-5008                          |

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## **NOTICE TO BIDDERS**

### **MUNICIPALITY OF BETHEL PARK ALLEGHENY COUNTY, PENNSYLVANIA**

Sealed Proposals will be received by the Municipality of Bethel Park via PennBid until 11:00 a.m. prevailing time on Tuesday, July 22, 2025, for:

#### **MINER'S PARK RESTROOM**

##### **Contract No. 1 – Base Bid - General Construction**

This project involves improvements to an existing municipal park, including, but not limited to, clearing and grubbing; existing site feature demolition; unclassified bulk excavation; erosion and sediment control measures; storm sewer installation; concrete paving; construction of a new restroom building; site feature protection; and associated landscaping and plantings, complete in place.

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##### **Contract No. 4 – Base Bid - Mechanical Construction**

This project involves mechanical construction for a new restroom building including, but not limited to, building mechanical construction, complete in place.

Pennsylvania Prevailing Wages **must** be paid on these Contracts.

There will be a **Mandatory** Pre-bid Meeting on Tuesday, July 8, 2025, at 11:00 a.m. at Miner's Park, 5440 Main Street, Bethel Park, PA 15102. Contractors who intend to bid any of the Contracts **MUST** attend for their Bid to be considered as **responsive**. "Attendance" for the purposes of this Paragraph shall mean being **present** for the entirety of the Meeting. Signing the Register at the beginning of the Meeting and leaving immediately thereafter will **not** constitute attendance. Note that the Meeting start time will be strictly enforced **unless** there were circumstances that affected most of the prospective bidders.

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.

Copies of Drawings, Specifications, Instructions to Bidders, General Conditions, Forms of Proposals and Agreement and all other information relating to this Solicitation will be available at no cost on the PennBid site ([www.PennBid.net](http://www.PennBid.net)).

All proposals **must** be submitted electronically via PennBid on or before Tuesday, July 22, 2025, at 11:00 a.m. prevailing time. At that time, Bids will be opened with results publicly displayed on PennBid. **No** hard copy Bids will be accepted. The Proposals must be made to the Municipality of Bethel Park, Allegheny County, Pennsylvania, and shall remain firm for a period of sixty (60) days. No Bidder may withdraw their Proposal during the sixty (60) day period without forfeiting their Proposal guarantee.

Proposals to receive consideration must be accompanied by a Certified Check or Bid Bond from a Surety authorized to do business in Pennsylvania, made to the order of the Municipality of Bethel Park in an amount equal to ten (10%) percent 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 ten (10) days after Notice of the Award of the Contract.

Bidders are advised that this Project is funded in part by a Local Share Account (LSA) Grant and that all LSA Grant requirements **must** be strictly followed.

The Municipality retains the right to award Contracts to the lowest **responsive**, qualified, and responsible Bidders based on consideration of quality of previous work, record of completing projects on time, history of payments to subcontractors and suppliers, maintenance of a permanent place of business, adequacy of equipment and plant to do the work, technical experience, a solid financial base to guarantee contract completion and all other factors deemed relative by the Municipality.

Bidders are also advised that the Municipality specifically reserves the right to award to the lowest responsible, responsive and qualified Bidder a contract for all or any portions of the work listed in the Proposal, and in awarding a contract for less than the total work listed, or less than all portions of the work listed, the contract price will be determined from the total quantities for each item listed and the unit price bid for each item listed.

The Municipality also reserves the right to reject any or all Proposals, or any part thereof, for any reason, and reserves the right to waive any informality therein.

This Project was financed (in part) by a grant from the Commonwealth of Pennsylvania, Commonwealth Financing Authority.

BY: Kristen Denne  
Municipal Manager

Date of Publication

June 26, 2025

July 3, 2025

**BID FORM AND PROPOSAL****ARTICLE 1 – BID RECIPIENT**

This Bid is submitted to: Municipality of Bethel Park via PennBid  
5100 West Library Road  
Bethel Park, PA 15102

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:****MINER’S PARK RESTROOM****Contract No. 1 – Base Bid - General Construction**

This project involves improvements to an existing municipal park, including, but not limited to, clearing and grubbing; existing site feature demolition; unclassified bulk excavation; erosion and sediment control measures; storm sewer installation; concrete paving; construction of a new restroom building; site feature protection; and associated landscaping and plantings, complete in place.

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### ARTICLE 3 – TIME OF COMPLETION

Bidders agree that the Work will be completed and ready for final payment in accordance with Article 15 of the General Conditions on or before October 31, 2025, or liquidated damages in the amount of one thousand dollars (\$1,000.00) 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 Bethel Park (Bethel) of actual damages, Contractors and their Sureties shall be liable to Bethel the sum of one thousand dollars (\$1,000.00) as fixed and agreed for each calendar 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. Contractors shall pay to Bethel without limiting Bethel's right to terminate Agreements for default as provided elsewhere herein.

Bidders accept 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 prices:

#### CONTRACT NO. 1 – BASE BID: GENERAL CONSTRUCTION

| Item No. | Description                                                                    | Unit | Quantity | Unit Price | Total |
|----------|--------------------------------------------------------------------------------|------|----------|------------|-------|
| 1        | Clearing and Grubbing / Site Demolition / Site Protection / Utility Protection | L.S. | 1        |            | \$    |
| 2        | Erosion and Sediment Control                                                   | L.S. | 1        |            | \$    |
| 3        | Site Improvements                                                              | L.S. | 1        |            | \$    |
| 4        | Earthwork                                                                      | L.S. | 1        |            | \$    |
| 5        | Storm Sewer                                                                    | L.S. | 1        |            | \$    |
| 6        | New Restroom Building                                                          | L.S. | 1        |            | \$    |
| 7        | Site Restoration / Site Protection<br>Project Coordination / Project Costs     | L.S. | 1        |            | \$    |
|          | <b>TOTAL BASE BID –<br/>CONTRACT NO. 1</b>                                     |      |          | \$         |       |

In Words: \_\_\_\_\_

**CONTRACT NO. 2 – BASE BID - ELECTRICAL CONSTRUCTION**

| <b>Item No.</b> | <b>Description</b>                     | <b>Unit</b> | <b>Quantity</b> | <b>Unit Price</b> | <b>Total</b> |
|-----------------|----------------------------------------|-------------|-----------------|-------------------|--------------|
| 1               | Electrical Site and Building Work      | L.S.        | 1               |                   | \$           |
|                 | <b>TOTAL BASE BID – CONTRACT NO. 2</b> |             |                 | \$                |              |

In Words: \_\_\_\_\_

**CONTRACT NO. 3 – BASE BID - PLUMBING CONSTRUCTION**

| <b>Item No.</b> | <b>Description</b>                     | <b>Unit</b> | <b>Quantity</b> | <b>Unit Price</b> | <b>Total</b> |
|-----------------|----------------------------------------|-------------|-----------------|-------------------|--------------|
| 1               | Plumbing Site and Building Work        | L.S.        | 1               |                   | \$           |
|                 | <b>TOTAL BASE BID – CONTRACT NO. 3</b> |             |                 | \$                |              |

In Words: \_\_\_\_\_

**CONTRACT NO. 4 – BASE BID - MECHANICAL CONSTRUCTION**

| <b>Item No.</b> | <b>Description</b>                     | <b>Unit</b> | <b>Quantity</b> | <b>Unit Price</b> | <b>Total</b> |
|-----------------|----------------------------------------|-------------|-----------------|-------------------|--------------|
| 1               | Mechanical Building Work               | L.S.        | 1               |                   | \$           |
|                 | <b>TOTAL BASE BID – CONTRACT NO. 4</b> |             |                 | \$                |              |

In Words: \_\_\_\_\_

Bidders shall note that Contract Numbers 1 through 4 are separate and independent contracts. Bidders may bid one, all, or any combination thereof if they are qualified to perform the work. Bidders shall select the Contract(s) that they intend to bid when starting their bid submission on the PennBid portal. Contracts, if awarded, will be awarded **separately** to the lowest qualified, responsible, and responsive bidder. No multiple contract discounts will be considered for the award.

The Municipality shall award each Contract to the lowest qualified, responsible, and **responsive** Bidder whose Bid meets the requirements and criteria set forth in these Specifications unless all bids are rejected, or the lowest qualified, responsible, and responsive Bidder is allowed to withdraw their bid upon compliance with the Public Contract Bid Withdrawal Law. The Municipality retains the right to award each Contract after consideration of the following: quality of previous work performed in the Municipality; the Contractor's record of completing projects on time; the Contractor's history of payments to subcontractors and suppliers; the maintenance of a permanent place of business; the adequacy of equipment and plant to perform the work; the technical experience of the Contractor's staff; a proven solid financial base to guarantee contract completion and any and all other factors deemed relative by the Municipality.

Bidders shall also note that bids will **only** be accepted from Bidders who **attended** the Mandatory Pre-bid Meeting on Tuesday, July 8, 2025, at 11:00 a.m. In addition, Bids **must** be submitted in the name of the company listed on the Mandatory Pre-Bid Register for the bid to be considered as **responsive**. "Attendance" for the purposes of this Paragraph shall mean being **present** for the entirety of the Meeting. Signing the Register at the beginning of the Meeting and leaving immediately thereafter will **not** constitute attendance. Note that the Meeting start time will be strictly enforced unless there were circumstances that affected most of the prospective bidders.

Bidders for Contract No. 1 acknowledge that each Bid Unit Price shown on the "Schedule of Values" includes an amount considered by the Bidder to be adequate to cover the overhead and profit for each separately identified item. Bidder acknowledges that estimated quantities are not guaranteed, and are solely for comparison of Bids, and final payment for all Bid Items will be based on **actual installed** quantities, determined as provided in the Contract Documents.

In addition, Bidders for Contract No. 1 acknowledge that the Municipality reserves the right to increase or decrease listed "Schedule of Value" quantities (including elimination of quantities in their entirety) without consideration for recovery of any or all direct or indirect costs associated with the adjusted or eliminated quantity subject to all applicable Sections of this Document.

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.

Unit Prices have been computed in accordance with Article 13 of the General Conditions.

A price adjustment for any material **will not** be permitted. Contractors shall include all costs necessary to complete the project in accordance with the Contract Documents by the listed date of final completion in their total bid price. A time adjustment due to material availability **may** be considered by the Owner upon submittal of acceptable documentation by the Contractor. Contractors shall note the material submittals shall be made no later than fifteen (15) days after Notice of Award (NOA). Material shall be ordered no later than ten (10) days after submittal approval.

Payments for "stored materials" including deposits or conditional payments required by Suppliers will not be considered for payment. All work must be "complete in place" for payment consideration.

Bidders for Contract No. 1 acknowledge that estimated quantities shown on the attached “Schedule of Values” are not guaranteed and are for the comparison of Bids as well as determining payment during the Work. Bidders for Contract No. 1 are advised that the total listed on the Schedule of Values **must** correspond to the total bid for Contract No. 1 for the bid to be considered as **responsive**. In addition, the Owner reserves the right to increase or decrease estimated quantities with applicable changes to the corresponding lump sum price. No additional compensation including adjustments to the Bid Unit Price will be considered in the event of decreased quantities regardless of the change in scope (including complete elimination).

The Municipality retains the right to reject any or all Bids, including without limitation, non-conforming, non-responsive, unbalanced, or conditional Bids. All Bidders shall note applicable language regarding unbalanced Bids elsewhere in these Specifications.

Bidders for Contracts Nos. 2, 3 and 4 acknowledge that Bidders **must** submit an itemized Schedule of Values with the Bid for the Bid to be considered as **responsive**. Said Schedule shall follow all Contract Document requirements as to form and substance; shall provide a reasonable allocation of the Contract Price to the component parts of the work; shall form the basis of payment for monthly payments from the Owner and shall become part of the Contract Documents.

#### **ARTICLE 5 – BIDDER'S ACKNOWLEDGEMENTS**

Bidder accepts all the terms and conditions of the Instructions to Bidders including without limitation those dealing with the disposition of Bid Security. This Bid shall remain subject to acceptance for sixty (60) days after the Bid opening date or for any additional period that the Bidder agrees to in reply to a written request from the Owner.

The Surety for the apparent low Bidder shall supply a signed and notarized letter prior to award stating that they will issue all required bonding in the event the apparent low Bid is more than fifteen (15%) percent lower than the second apparent low bid.

All applicable provision of the Contract Document shall apply if the Surety in the above referenced scenario does not agree to issue the required bonding.

The Owner reserves the right to withhold the awarding of the Bids on this project for a period of sixty (60) days or for such period that the apparent low Bidder agrees to in reply to a written request from the Owner.



## 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, requests, and claims shall be made in writing to the Owner in accordance with time requirements specified elsewhere in these Specifications. Notices, requests, and claims not made in a timely manner will not be considered by the Owner.

## **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 anything 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 ten (10%) percent in favor of the Municipality of Bethel Park, 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
- C. List of Proposed Suppliers
- D. Statement of Bidder's Qualifications listing at least three (3) projects **similar in nature** to the project being contemplated performed within the past five (5) years. All listed projects shall have been conducted under the Bidder's registered corporate name.
- E. Non-Collusion Affidavit
- F. Public Works Employment Verification Form
- G. For **Contract No. 1**: Completed Schedule of Values (SOV). The SOV can be found in the Attachment Section of the Contract Documents and **must** correspond to the total Bid for Contract No. 1 for the Bid to be considered as **responsive**.
- H. For **Contracts Nos. 2, 3 and 4**: Bidders must submit an itemized Schedule of Values with the Bid for the Bid to be considered as **responsive**. Said Schedule shall follow all Contract Document requirements as to form and substance.

## 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

(Seal)

(Seal)

Bidder'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

*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 \_\_\_\_\_ :

I state that I am \_\_\_\_\_  
(Title)  
of \_\_\_\_\_  
(Name of my firm)

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.

#### 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 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.
- 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.
- 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
- 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 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
    - \$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





REQUEST FOR PROPOSALS TO BE RECEIVED ON , 20

FOR:

**ADDENDUM NO.**

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 \_\_\_\_\_

|                           |                             |
|---------------------------|-----------------------------|
| _____<br>(Name of Bidder) | _____<br>(Signature)        |
| _____<br>(Date)           | _____<br>(Title of Officer) |

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**Addendum**

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**000490 - 2**

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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., 400 Holliday Drive, Pittsburgh, Pa 15220.

- 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 of 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:

CONTRACTOR:

\_\_\_\_\_

\_\_\_\_\_

By: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

Attest: \_\_\_\_\_

Attest: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

Address for giving notices:

Address for giving notices:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

License No.: \_\_\_\_\_  
*(where applicable)*

Phone No. \_\_\_\_\_

Fax No. \_\_\_\_\_

## 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



|                                                              |                                                                                                                                                                                                             |                   |
|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <b>ACORD<sup>TM</sup> CERTIFICATE OF LIABILITY INSURANCE</b> |                                                                                                                                                                                                             | DATE (MM/DD/YYYY) |
| PRODUCER                                                     | THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. |                   |
| INSURED                                                      | <b>INSURERS AFFORDING COVERAGE</b>                                                                                                                                                                          |                   |
|                                                              | NAIC #                                                                                                                                                                                                      |                   |
|                                                              | INSURER A:                                                                                                                                                                                                  |                   |
|                                                              | INSURER B:                                                                                                                                                                                                  |                   |
|                                                              | INSURER C:                                                                                                                                                                                                  |                   |
|                                                              | INSURER D:                                                                                                                                                                                                  |                   |
|                                                              | INSURER E:                                                                                                                                                                                                  |                   |

### COVERAGES

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

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.<br>AUTHORIZED REPRESENTATIVE |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

ACORD 25 (2001/08)

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# 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

## 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 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;
  - 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:
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.





# CONTRACTORS APPLICATION FOR PAYMENT

TO OWNER:

PROJECT:

APPLICATION NO.:

APPLICATION PERIOD:

APPLICATION DATE:

FROM CONTRACTOR:

VIA ENGINEER:

The Gateway Engineers, Inc.  
400 Holiday Drive, Suite 300  
Pittsburgh, PA 15220

PROJECT NUMBERS:

Engineer's: C-  
Contractor's:  
Owner's:

## CONTRACTOR'S APPLICATION FOR PAYMENT

See the attached continuation sheet(s)

|                                                                          |    |        |
|--------------------------------------------------------------------------|----|--------|
| 1. ORIGINAL CONTRACT PRICE                                               | \$ | \$0.00 |
| 2. Net change by Change Orders                                           | \$ | \$0.00 |
| 3. CURRENT CONTRACT PRICE (Line 1 ± 2)                                   | \$ | \$0.00 |
| 4. TOTAL COMPLETED AND STORED TO DATE<br>(Column F on Progress Estimate) | \$ | \$0.00 |
| 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 |

## CONTRACTOR'S CERTIFICATION

The undersigned Contractor certifies that: (1) all previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to Owner indemnifying Owner against any such Liens, security interest or encumbrances); and (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

CONTRACTOR:

By: \_\_\_\_\_ Date: \_\_\_\_\_

## ENGINEER'S CERTIFICATION

In accordance with the Contract Documents, based on on-site observations and the data comprising the application, the Engineer certifies to the Owner that to the best of the Engineer's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment in the AMOUNT CERTIFIED.

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          | \$0.00    |            |

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

|                     |  |              |      |                     |           |                      |                             |                        |                                       |                                          |         |                         |
|---------------------|--|--------------|------|---------------------|-----------|----------------------|-----------------------------|------------------------|---------------------------------------|------------------------------------------|---------|-------------------------|
| For (contract):     |  |              |      | Application Number: |           |                      |                             |                        |                                       |                                          |         |                         |
| Application Period: |  |              |      | Application Date:   |           |                      |                             |                        |                                       |                                          |         |                         |
| A                   |  |              |      | B                   | C         | D                    | E                           | F                      | G                                     |                                          |         |                         |
| Item No.            |  | Bid Quantity | Unit | Unit Price          | Bid Value | Quantity This Period | Installed Value This Period | Total Quantity To Date | Materials Presently Stored (not in D) | Total Value Completed and Stored to Date | % (F/B) | Balance to Finish (B-F) |
| Description         |  |              |      |                     |           |                      |                             |                        |                                       |                                          |         |                         |
| Totals              |  |              |      |                     | \$0.00    |                      | \$0.00                      |                        | \$0.00                                | \$0.00                                   |         | \$0.00                  |

# 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, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 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;
  - l. 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, agents, 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 is 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.

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

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***

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.

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.

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:              | Miner's Park Restroom                                                                                                                                                                                                                                                                                                                                                                                                                            |
| General Description:       | This project involves improvements to an existing municipal park, including, but not limited to, clearing and grubbing; existing site feature demolition; unclassified bulk excavation; erosion and sediment control measures; storm sewer installation; concrete paving; construction of a new restroom building; site feature protection; site water, sewer, and electrical work; and associated landscaping and plantings, complete in place. |
| Project Locality           | Municipality of Bethel Park                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Awarding Agency:           | Municipality of Bethel Park                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Contract Award Date:       | 7/1/2025                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Serial Number:             | 25-05468                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Project Classification:    | Building/Heavy/Highway                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Determination Date:        | 5/22/2025                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 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**

| <b>Project: 25-05468 - Building</b>                                              | <b>Effective Date</b> | <b>Expiration Date</b> | <b>Hourly Rate</b> | <b>Fringe Benefits</b> | <b>Total</b> |
|----------------------------------------------------------------------------------|-----------------------|------------------------|--------------------|------------------------|--------------|
| Asbestos & Insulation Workers                                                    | 8/1/2024              |                        | \$43.40            | \$29.51                | \$72.91      |
| Boilermakers                                                                     | 6/1/2016              |                        | \$40.90            | \$27.61                | \$68.51      |
| Bricklayer                                                                       | 6/1/2024              |                        | \$40.25            | \$25.34                | \$65.59      |
| Bricklayer                                                                       | 12/1/2024             |                        | \$41.00            | \$25.59                | \$66.59      |
| Bricklayer                                                                       | 6/1/2025              |                        | \$41.50            | \$26.09                | \$67.59      |
| 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 | 6/1/2024              |                        | \$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                                                                    | 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            | \$24.63                | \$58.64      |
| Electricians & Telecommunications Installation Technician                        | 12/22/2023            |                        | \$48.61            | \$31.80                | \$80.41      |
| Electricians & Telecommunications Installation Technician                        | 12/27/2024            |                        | \$50.86            | \$32.69                | \$83.55      |
| Electricians & Telecommunications Installation Technician                        | 12/26/2025            |                        | \$54.16            | \$32.69                | \$86.85      |
| Elevator Constructor                                                             | 1/1/2024              |                        | \$58.55            | \$43.87                | \$102.42     |
| Elevator Constructor                                                             | 1/1/2025              |                        | \$61.07            | \$40.05                | \$101.12     |
| Glazier                                                                          | 9/1/2024              |                        | \$37.06            | \$31.89                | \$68.95      |
| Iron Workers                                                                     | 6/1/2024              |                        | \$39.89            | \$36.47                | \$76.36      |
| Iron Workers                                                                     | 6/1/2025              |                        | \$41.50            | \$37.36                | \$78.86      |
| 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)                                                  | 1/1/2024              |                        | \$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)                                                  | 1/1/2024              |                        | \$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)                                                      | 1/1/2024              |                        | \$24.79            | \$18.53                | \$43.32      |
| 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)                                             | 1/1/2024              |                        | \$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                                                                | 1/1/2024              |                        | \$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      |

# BUREAU OF LABOR LAW COMPLIANCE PREVAILING WAGES PROJECT RATES

| Project: 25-05468 - Building     | Effective Date | Expiration Date | Hourly Rate | Fringe Benefits | Total   |
|----------------------------------|----------------|-----------------|-------------|-----------------|---------|
| Operators (Class 01 - see notes) | 6/1/2024       |                 | \$41.69     | \$24.39         | \$66.08 |
| Operators (Class 01 - see notes) | 6/1/2025       |                 | \$42.72     | \$24.79         | \$67.51 |
| Operators (Class 01 - see notes) | 6/1/2026       |                 | \$43.74     | \$25.29         | \$69.03 |
| Operators (Class 02 -see notes)  | 6/1/2024       |                 | \$35.62     | \$24.39         | \$60.01 |
| Operators (Class 02 -see notes)  | 6/1/2025       |                 | \$36.67     | \$24.79         | \$61.46 |
| Operators (Class 02 -see notes)  | 6/1/2026       |                 | \$37.67     | \$25.29         | \$62.96 |
| Operators (Class 03 - See notes) | 6/1/2024       |                 | \$32.83     | \$24.39         | \$57.22 |
| Operators (Class 03 - See notes) | 6/1/2025       |                 | \$33.88     | \$24.79         | \$58.67 |
| Operators (Class 03 - See notes) | 6/1/2026       |                 | \$34.88     | \$25.29         | \$60.17 |
| 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                      | 1/1/2024       |                 | \$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                       | 6/1/2024       |                 | \$33.14     | \$21.04         | \$54.18 |
| 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     | 12/1/2024      |                 | \$39.69     | \$21.61         | \$61.30 |
| Pointers, Caulkers, Cleaners     | 6/1/2025       |                 | \$40.66     | \$21.99         | \$62.65 |
| Roofers                          | 6/2/2024       |                 | \$38.00     | \$20.67         | \$58.67 |
| Sheet Metal Workers              | 7/1/2024       |                 | \$43.00     | \$33.96         | \$76.96 |
| Sign Makers and Hangars          | 7/15/2024      |                 | \$32.32     | \$25.82         | \$58.14 |
| Sprinklerfitters                 | 7/1/2024       |                 | \$45.38     | \$26.46         | \$71.84 |
| Sprinklerfitters                 | 1/1/2025       |                 | \$44.79     | \$27.05         | \$71.84 |
| Steamfitters                     | 6/1/2024       |                 | \$48.15     | \$29.57         | \$77.72 |
| Steamfitters                     | 6/1/2025       |                 | \$50.20     | \$31.02         | \$81.22 |
| Stone Masons                     | 12/1/2024      |                 | \$43.10     | \$24.22         | \$67.32 |
| Stone Masons                     | 6/1/2025       |                 | \$43.60     | \$24.72         | \$68.32 |
| Terrazzo Finisher                | 12/1/2024      |                 | \$41.04     | \$18.72         | \$59.76 |
| Terrazzo Finisher                | 6/1/2025       |                 | \$41.73     | \$19.03         | \$60.76 |
| Terrazzo Mechanics               | 12/1/2024      |                 | \$40.39     | \$21.02         | \$61.41 |
| Terrazzo Mechanics               | 6/1/2025       |                 | \$41.13     | \$21.28         | \$62.41 |
| Tile Finisher                    | 12/1/2024      |                 | \$32.51     | \$17.99         | \$50.50 |
| Tile Finisher                    | 6/1/2025       |                 | \$33.24     | \$18.36         | \$51.60 |
| Tile Setter                      | 12/1/2024      |                 | \$39.41     | \$22.44         | \$61.85 |
| Tile Setter                      | 6/1/2025       |                 | \$40.15     | \$22.80         | \$62.95 |
| 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)  | 1/1/2024       |                 | \$35.39     | \$23.02         | \$58.41 |
| Truckdriver class 2 (see notes)  | 1/1/2025       |                 | \$36.89     | \$23.52         | \$60.41 |

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

| Project: 25-05468 - Building    | Effective Date | Expiration Date | Hourly Rate | Fringe Benefits | Total   |
|---------------------------------|----------------|-----------------|-------------|-----------------|---------|
| 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: 25-05468 - Heavy/Highway                                         | Effective Date | Expiration Date | Hourly Rate | Fringe Benefits | Total   |
|---------------------------------------------------------------------------|----------------|-----------------|-------------|-----------------|---------|
| 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                                                          | 1/1/2024       |                 | \$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                                            | 1/1/2024       |                 | \$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                                                          | 1/1/2024       |                 | \$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                                                          | 6/3/2024       |                 | \$53.97     | \$31.05         | \$85.02 |
| 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) | 6/1/2024       |                 | \$39.89     | \$36.47         | \$76.36 |
| Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing) | 6/1/2025       |                 | \$41.50     | \$37.36         | \$78.86 |
| 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 |
| 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 |

# BUREAU OF LABOR LAW COMPLIANCE PREVAILING WAGES PROJECT RATES

| Project: 25-05468 - Heavy/Highway | Effective Date | Expiration Date | Hourly Rate | Fringe Benefits | Total   |
|-----------------------------------|----------------|-----------------|-------------|-----------------|---------|
| 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                        | 6/1/2024       |                 | \$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 01 - see notes)  | 1/1/2026       |                 | \$41.96     | \$24.66         | \$66.62 |
| 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 02 -see notes)   | 1/1/2026       |                 | \$41.70     | \$24.66         | \$66.36 |
| 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 03 - See notes)  | 1/1/2026       |                 | \$38.05     | \$24.66         | \$62.71 |
| 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 04 - See notes)  | 1/1/2026       |                 | \$37.59     | \$24.66         | \$62.25 |
| 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 05 - See notes)  | 1/1/2026       |                 | \$37.34     | \$24.66         | \$62.00 |
| 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-A               | 1/1/2026       |                 | \$44.96     | \$24.66         | \$69.62 |
| 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 |
| Operators Class 1-B               | 1/1/2026       |                 | \$43.96     | \$24.66         | \$68.62 |
| Painters Class 1 (see notes)      | 6/1/2022       |                 | \$34.45     | \$22.82         | \$57.27 |
| 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)      | 6/1/2024       |                 | \$40.66     | \$24.93         | \$65.59 |
| 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 |



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

| <b>Project: 25-05468 - Heavy/Highway</b>            | <b>Effective Date</b> | <b>Expiration Date</b> | <b>Hourly Rate</b> | <b>Fringe Benefits</b> | <b>Total</b> |
|-----------------------------------------------------|-----------------------|------------------------|--------------------|------------------------|--------------|
| 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                                         | 1/1/2024              |                        | \$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)                      | 1/1/2024              |                        | \$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)                     | 1/1/2024              |                        | \$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      |

## No. \_\_\_\_\_

Contract Name:

Description:

☐ Other

Title:



## Change 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:

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

|                                     |                                           |                                                |
|-------------------------------------|-------------------------------------------|------------------------------------------------|
| RECOMMENDED:                        | ACCEPTED:                                 | ACCEPTED:                                      |
| By: _____<br>Engineer (if required) | By: _____<br>Owner (Authorized Signature) | By: _____<br>Contractor (Authorized Signature) |
| Title: _____                        | Title: _____                              | Title: _____                                   |
| Date: _____                         | Date: _____                               | 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:

Engineer (Authorized Signature)

By:

Contractor (Authorized Signature)

Title:

Title:

Date:

Date:

Copy to: Owner



## SECTION 01100 - SUMMARY

## 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 the following:
  - 1. Work Covered by Contract Documents.
  - 2. Type of Contract.
  - 3. Use of Premises.
  - 4. Work Restrictions.
  - 5. Specification Formats and Conventions.

## 1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Miner's Park Restroom
  - 1. Project Location: 5440 Main Street, Bethel Park, PA 15102
- B. Owner: Municipality of Bethel Park, 5100 West Library Road, Bethel Park, PA 15102
  - 1. Owner's Representative: Kristen Denne, Municipal Manager
- C. Engineer: The Gateway Engineers, Inc., 100 McMorris Road, Pittsburgh, PA 15205
  - 1. Scott Baker – Project Manager
- D. Electrical Engineer: Sulosky Design Group, LLC, 830 Wildcat Way, Latrobe, PA 15650
  - 1. Steve Sulosky, P.E. - Principal
- E. Mechanical/Plumbing Engineer: Andelmo Engineering, 11980 Lee Drive, N. Huntingdon, PA 15642
  - 1. Don Andelmo, P.E. - Principal



- F. The Work consists of the following:

**Contract No. 1 – Base Bid - General Construction**

This project involves improvements to an existing municipal park, including, but not limited to, clearing and grubbing; existing site feature demolition; unclassified bulk excavation; erosion and sediment control measures; storm sewer installation; concrete paving; construction of a new restroom building; site feature protection; and associated landscaping and plantings, complete in place.

**Contract No. 2 – Base Bid - Electrical Construction**

This project involves electrical construction for a new restroom building including, but not limited to, site and building electrical construction, complete in place.

**Contract No. 3 – Base Bid - Plumbing Construction**

This project involves plumbing construction for a new restroom building including, but not limited to, site and building plumbing construction, complete in place.

**Contract No. 4 – Base Bid - Mechanical Construction**

This project involves mechanical construction for a new restroom building including, but not limited to, building mechanical construction, complete in place.

1.4 TYPE OF CONTRACT

- A. This project will be constructed under multiple prime unit price / lump sum contracts.

1.5 USE OF PREMISES

- A. General: Contractors shall have limited use of premises for construction operations as indicated on the Construction Drawings, Approved Permitted Limits of Disturbance and/or the Borough.
- B. Use of Site: Limit use of premises to areas indicated by the Borough and Drawings. Do not disturb portions of project site beyond areas in which the Work is indicated.
1. Limits: Confine constructions operations to public easements and rights-of-way.
  2. Driveways, Parking Lots and Entrances: Keep driveways, parking lots and entrances serving premises clear and available to the Owner, property owners and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
    - a. Schedule deliveries to minimize use of driveways, parking lots, and entrances.
    - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
  3. Site Status: The Contractor shall note the site will continue to operate as a Municipal Park and as such the Contractor shall coordinate his Work with the Municipality and their representatives to maintain access and permit Park operations to function with minimal disruption. No additional compensation or time will be considered for compliance with this requirement. In addition, required site safety measures such as temporary fence shall be placed at no additional cost to the Owner.

## 1.6 WORK RESTRICTIONS

- A. Work Hours: Work shall be generally performed within the Municipality between the hours of 7:00 a.m. to 5:00 p.m., Monday through Friday, except as otherwise indicated, or as otherwise required by the Municipality.
1. Weekend Hours: No weekend hours will be permitted without prior written approval of Borough and/or Engineer. Submit written requests for Saturday work at least forty-eight (48) hours in advance to the Municipality and/or the Engineer. Under no circumstances will Sunday or National Holiday work be permitted.
- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Borough or property owners until after arranging to provide temporary utility services according to requirements indicated below:
1. Notify Owner / Engineer / Property Owner not less than three (3) days in advance of proposed utility interruption(s).
  2. Do not proceed with utility interruption(s) without Owner and/or Engineer'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 the 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, 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 the following:
1. General Specifications.
  2. Pre-construction Conference.
  3. Construction Documentation.
  4. Notification Requirements.
  5. Federal, State and Local Requirements.
  6. Prevailing Wage and Schedule Requirements.
  7. COVID-19 Guidelines.
  8. Inspection (Engineer's Representative) Services.
  9. Suspension of Work Procedure.
  10. Liquidated Damages / Penalties.

## 1.3 GENERAL SPECIFICATIONS

- A. A **Mandatory** Pre-Bid Meeting will be held at Miner's Park, 5440 Main Street, Bethel Park, PA 15102, on July 8, 2025, at 11:00 a.m., prevailing time. Contractors who intend to bid must attend for their Bid to be considered as **responsive**. In addition, the name of the bidding entity shown on the Mandatory Pre-Bid Meeting Sign-In Sheet must match the corporate name shown on the submitted Bid. "Attendance" for the purposes of this Paragraph shall mean being **present** for the entirety of the Meeting. Signing the Register at the beginning of the Meeting and leaving immediately thereafter will not constitute attendance. Note that the Meeting start time will be strictly enforced unless there were circumstances that affected most of the prospective bidders.
- B. The Bidder shall become familiar with the work sites and submit their Bid based on this Specification and their personal knowledge of construction techniques. No additional compensation will be allowed except as may be warranted by a duly executed Change Order.

- C. The work to be performed under this Contract shall consist of providing all labor, materials, tools, and equipment that is necessary and required to complete the Work in accordance with the Contract Documents. It is understood that the Bid is a combination of a lump sum and unit price bids and that the Owner reserves the right to increase or decrease or delete in its entirety the amount of work to be performed under this Contract per applicable Contract provisions at no additional charge to the Owner. No additional compensation, including claims for lost overhead and profit, or requests for changes to the Bid Unit Prices, will be considered for items decreased or removed in their entirety.
- D. All Contractors and Subcontractors shall become familiar with the contents of this total Contract Document and the responsibilities of other Contractors, utility companies, the Engineer and Owner.
- E. Pennsylvania Prevailing Wages **must** be paid on this Contract. The Contractor shall supply the Engineer with weekly certified payrolls or with each Application for Payment. Failure to comply with this requirement may be grounds for delay in Application for Payment processing by the Municipality.
- F. Contractors shall prepare and submit a Work Schedule to the Engineer for approval within ten (10) working days after receiving Notice of Award (NOA). Contractors shall not begin work without an approved schedule. The successful bidder for "Contract No. 1 – Base Bid – General Construction" will be designated as the "Project Coordinator" and will be responsible to compile a "Master Schedule" from all other Base Bid Contractors for submittal to the Engineer and Owner prior to beginning work on the site. Updated individual Work Schedules shall be submitted with each Application for Payment to the Project Coordinator. Failure to submit updated individual Work Schedules may result in a payment processing delay by the Municipality. Note that the Project Coordinator will be required to submit an updated Master Schedule with each Application for Payment.
- G. The Contractor shall prepare and submit to the Engineer for approval a Schedule of Values for Lump Sum Bid Items per Article 2 of the General Conditions **with** the Bid Form and Proposal. The approved Schedule of Values for each Lump Sum Bid Item shall be used as a basis for preparing, reviewing, and approving the Contractor's Applications for Payment and Change Orders as required.
- H. The Owner retains the right to award Contracts to the lowest **responsive**, responsible, and qualified Bidders based on consideration of the quality of previous work; record of completing projects on time; history of payments to subcontractors and suppliers; maintenance of a permanent place of business; adequacy of equipment and plant to do the work; technical experience; a solid financial base to guarantee contract completion and all other factors deemed relative by the Owner. Bidders shall note this Paragraph may be superseded by other **specific** Municipal requirements listed on the Bid Form and Proposal (if applicable).
- I. All Work shall be done in accordance with the Details as shown on the Drawings and the requirements of the Specifications except as hereinafter modified. The Engineer shall determine which shall govern if, at any time, the Drawings, Details, Specifications, Approved Permits, Instructions to Bidders, General Conditions and Supplementary Conditions conflict. The Contractor shall observe this determination at **no additional** cost to the Owner.

- J. Any item of work, construction or material which is not specifically described in the Details, Drawings, Specifications, Approved Permits, Instructions to Bidder and/or General and Special Conditions shall be governed by the applicable Sections of the Pennsylvania Department of Highways (PennDOT) Publication 408 (latest revision). PennDOT Publication 408 time and payment provisions will **not** apply to this Contract.
- K. The Contractor shall adhere to these Specifications and PennDOT Publication 213 for work zone traffic control at no additional cost to the Owner.
- L. The Contractor shall furnish the Engineer a complete statement of the origin, composition, and manufacture of all materials to be incorporated into the work within fifteen (15) days of receiving Notice of Award. All materials shall comply with the requirements of the Contract Documents as well as the most recent applicable ASTM specification.
- M. Whenever a material or article required is specified or shown on the plans by using the name of a proprietary product or a 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. Approval of such substitutions shall be by applicable Contract provisions.
- N. The Contractor shall always conduct his operations in a neat and workmanlike manner and at the end of each day's work remove from the premises all debris and rubbish resulting from his operations. The Contractor shall secure the site at the end of every workday and provide the Owner and Engineer's Representative twenty-four (24)-hour emergency telephone numbers.
- O. The Contractor shall be fully responsible for all materials and equipment delivered and stored at the project site during the prosecution of the Work. The Contractor shall restore all staging and storage areas to pre-existing conditions at no additional cost to the Owner.
- P. The Contractor shall begin work on the site within ten (10) days after receiving Notice to Proceed (or as otherwise indicated elsewhere in the Contract Documents) and shall be fully responsible for the unfinished work as it progresses until completion and final acceptance thereof.
- Q. The Contractor's attention is called to the fact all excess (including sewer and trench spoils), demolished, cleared, or removed materials become the Contractor's property and must be transported from the site and disposed of in a completely permitted facility. Written evidence of compliance with permitting requirements shall be furnished to the Owner upon written request.
- R. The Contractor acknowledges that each Bid Lump Sum or Unit Price includes an amount considered by the Contractor to be adequate to cover the overhead and profit for each separately identified item. The Contractor acknowledges that estimated quantities shown on the Schedule of Values are not guaranteed, and are solely for comparison of Bids, and final payment for all Bid Items will be based on **actual installed** quantities, determined as provided in the Contract Documents.

- S. The Contractor acknowledges that the Municipality reserves the right to increase or decrease listed Schedule of Value quantities (including elimination of quantities in their entirety) without consideration for recovery of any or all direct or indirect costs associated with the adjusted or **eliminated** quantity subject to all applicable Sections of this Document.
- T. 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 as follows:
1. By applicable unit prices set forth in the Contract, if the quantity of the units is not increased by more than one hundred (100%) percent or
  2. If no such unit prices are set forth, or if the quantities of the units are increased by more than one hundred (100%) percent, then by unit prices or by an agreed upon lump sum amount or
  3. If no such unit prices are set forth and if no agreement can be reached upon a unit price or lump sum, then by actual net cost in money to the Contractor of the labor and materials, including insurance, taxes, equipment and plant rentals, plus the applicable percentages as outlined in the General and Supplementary Conditions as compensation for all other items or profit and costs, including administration, overhead, superintendence, small tools, additional performance bond premiums, allowances by the Contractor to the Subcontractor and materials used in temporary structures.
- U. Pennsylvania Act 287 of 1974 as amended by Act 50 of 2017, 73 P.S. 176 et. Seq. contains provisions for each stakeholder regarding the reporting of alleged violations. The report should be submitted to the Pennsylvania Public Utility Commission through the One Call System pursuant to the time frame set forth in Act 50 of 2017.
1. Facility Owner – Submit a report of alleged violation not more than thirty (30) business days after receipt of notice that the facility owner's lines have been damaged by excavation or demolition work or if the facility owner believes a violation of the Act has been committed in association with excavation or demolition work. No report may be required where the cost to repair the damage to the facility owner's lines is less than two thousand five hundred dollars (\$ 2,500.00), unless the same person damaged the facility owner's lines two (2) or more times within a six (6)-month period.
  2. Designer – Submit a report of alleged violation not more than thirty (30) business days from the time the designer becomes aware that a violation of this Act may have been committed in association with excavation or demolition work.
  3. Excavator – Submit a report of an alleged violation not more than thirty (30) business days after striking or damaging a facility owner's line during excavation or demolition or if the excavator believes a violation of this Act has been committed in association with excavation or demolition work. Excavators shall **immediately** notify the Designer and Project Owner after striking or damaging a facility owner's line. Failure to notify the Designer and Project Owner will result in the assumption of payment for all fines that may be assessed to the Designer and/or the Project Owner.
  4. Project Owner – Submit a report of alleged violation not more than thirty (30) business days after striking or damaging a facility owner's line during excavation or demolition work activities, after a project owner's contracted excavator strikes or damages a facility owner's line during excavation or demolition activities or if the project owner believes a violation of this Act has been committed in association with excavation or demolition

- V. Should it be deemed expedient by the Owner or Engineer at any time during the progress of the Work to decrease the dimensions, quantity of material or work, or alter the situation or levels, or vary in any other form the Work herein Contracted for, the Owner and the Engineer shall have the full power to order and direct such decreased work or alteration without in any way affecting the validity of said Contract or be liable for recovery for any or all direct or indirect costs associated with the decreased, adjusted or **eliminated** quantity of work.
- W. It is intended that the Contract Documents produce a **complete in place** installation and as such any work that may reasonably be inferred as being required to produce the intended result shall be supplied whether or not it is specifically called for in the Bid Form and Proposal and/or Unit Price Descriptions. Such items of work, including **all** project costs, shall be included in the bidding item considered most appropriate by the Contractor. No change in the Contract Price and/or Contract Time will be considered for compliance with this Paragraph.
- X. The Contractor shall note that sizing and supplying of proposed structures shall be his sole responsibility regardless of the callouts shown on the Drawings and the Bid Form and Proposal and as described in the Unit Price descriptions. No additional payment will be considered for upsizing or change to any required structure from the size indicated on the Drawings unless such upsizing or change was requested during the bidding process and agreed to by the Owner and Engineer. In addition, no additional payment will be considered for the use of "poured-in-place" structures in lieu of precast structures.
- Y. Adequate protection and/or shoring shall be provided for all lawns, shrubs, underground utilities, trees, buildings, houses, structures, above-ground utility poles, lines, and guy wires within the limits of work. The Contractor shall be responsible to replace all damaged items at no additional cost to the Owner. In addition, all such protection and/or shoring costs and/or utility locating costs, including delegated design and survey costs; utility pole support costs and utility locating costs (including hydroexcavation) shall be included in the bidding item considered most appropriate by the Contractor.
- Z. The Contractor shall provide all necessary and reasonable safeguards including, but not limited to, the installation of sheeting, shoring, structural supports, road plates and temporary protective fencing and barriers (including temporary chain link fence), in order to prevent damage to adjacent property or injury to persons at no additional cost to the Owner. All work shall be performed in accordance with the requirements of local building codes and the rules, regulations, and ordinances of all other governing bodies having jurisdiction. The cost to provide road plates, temporary protective fencing and/or barriers shall be included in the total cost of the Work. Costs to provide safeguards directed by the Owner to correct unanticipated deficiencies after the commencement of work shall be paid under applicable Contract provisions. Costs to provided safeguards directed by the Owner to correct deficiencies that should have been reasonably anticipated shall be the sole responsibility of the Contractor and provided at no additional cost to the Owner.
- AA. The Contractor shall be held solely responsible for any claim arising from his failure to provide adequate safeguards or for his failure to conduct his operation in a manner consistent with the rules, regulations and ordinances of all governing bodies having jurisdiction. All protective measures shall be supplied by the Contractor at no additional cost to the Owner.



- BB. All public utility lines or **private service lines** that are damaged by the result of the Contractor's actions shall be repaired at the Contractor's sole expense. The Contractor shall schedule work in order to limit interference with all on-site utility company activity or work. Additional compensation, other than time, will not be considered for delays resulting from the work of utility companies within the project limits.
- CC. The Contractor shall always control the work, provide adequate on-site supervision, and ensure the work is performed faithfully, efficiently and in full compliance with the Contract Documents. The Contractor shall always supervise the Work personally or have a competent Foreman on-site, including during work performed by Subcontractors, to receive orders and directions from the Owner and/or Engineer's Representative. The on-site Foreman shall be clothed with full authority by the Contractor to execute all given orders without delay and make all necessary arrangements for carrying out the Work.
- DD. The Contractor shall enter into the Contract with the complete understanding that he shall be solely responsible for the means and methods of construction, safety measures and the protection and quality of the Work.
- EE. 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 Owner or to any third party to inspect work within the project limits to ensure compliance with Occupational Safety Health Administration (OSHA) standards.
- FF. In the event of temporary suspension of work or during inclement weather, or whenever the Engineer shall direct, the Contractor will, and will cause his Subcontractors, to protect carefully his and their work and materials against damage or injury from the weather. Unprotected work shall be repaired at no additional cost to the Owner.
- GG. If, in the opinion of the Engineer, any work or material shall have been damaged due to failure on the part of the Contractor or any of his Subcontractors to protect the work, such work or materials shall be removed and replaced at the sole cost and expense of the Contractor.
- HH. The Engineer (or his authorized Representative) shall be designated as the Owner's Representative during construction and shall approve or reject the Work contemplated under these Contract Documents. The Engineer (or his authorized Representative) shall determine the amount, quality, acceptability and fitness of all work and materials. The Engineer's (or his authorized Representative) estimates and decisions shall be final and conclusive, except as herein otherwise expressly provided. In case questions arise between the Contractor and Engineer (or his authorized Representative) hereto relative to said Contract Documents, the determination or decision of the Engineer (or his authorized Representative) 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 question.

- II. 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, any Subcontractor, any of their agents or employees or any other person. The Engineer shall not be responsible for the construction means, methods, techniques, sequences or procedures, 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 Subcontractor, or any of the Contractor or Subcontractors agents or employees, or any other person performing any of the work.
- JJ. A final inspection shall be made by the Engineer and the representative of the Owner prior to final acceptance of the Work.
- KK. All work, all materials whether incorporated in the work or not, all processes of manufacture and all methods of construction shall be at all times and places subject to the inspection of the Engineer who shall be the final judge of the quality and suitability of the work, materials, processes of manufacture and methods of construction for the purposes for which they are used. Should they fail to meet his approval, they shall be forthwith reconstructed, made good, replaced and/or corrected by the Contractor at his sole expense. Rejected material shall be immediately removed from the site and not re-incorporated into the work.
- LL. If, in the opinion of the Engineer, it is undesirable to replace any defective or damaged materials, or to reconstruct or correct any portions of the work damaged or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor hereunder shall be reduced by such amount as in the judgment of the Engineer shall be equitable.
- MM. 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 General and Supplemental Conditions and the Drawings, from the date of commencement of the work until the expiration of the Maintenance Bond, being two (2) years from the date of **final acceptance**, regardless of the date of physical completion of the Work, issued by the Owner. It shall be understood that the issuance of final payment 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.
- NN. Should the Contractor encounter subsurface and/or latent conditions materially differing from those shown on the Plans and/or indicated in the Contract Documents, he shall **immediately** give notice to the Engineer of such conditions before they are disturbed. The Engineer shall thereupon promptly investigate the conditions and if he finds that they materially differ from those shown on the Plans or indicated in the Contract Documents, he shall as soon as practical, make such changes in the Plans and or Specifications as necessary. Any increase or decrease of cost resulting from such changes shall be adjusted in strict accordance with Article 11 of the General Conditions. No "downtime" charges will be considered for the time period from the Contractor's notification through the Engineer's investigation for determining and issuance of subsequent required changes to the Plans and/or Specifications.

- OO. Upon award of the Contract, the Contractor shall inform all public service companies, individuals and others owning or controlling any structures, utilities or tracks within the limits of the project area, of any and all items that may have to be removed, reset, reconstructed or supported. The Contractor shall give such notice to the responsible party in sufficient time to organize and perform such work in conjunction with and/or in advance of the Contractor's operations. Time extension requests caused by the Contractor's failure to give timely notice will not be considered.
- PP. Trenching, excavating, and backfilling for sanitary sewer, waterline, and gas lines shall be performed by the Plumbing Contractor. Trenching, excavating, and backfilling for electrical conduit shall be performed by the Electrical Contractor unless otherwise noted.
- QQ. The Contractor for Contract No. 1 – Base Bid – General Construction shall perform a ground penetrating radar (GPR) survey of all existing utilities (storm, sanitary, waterline, gas line, electric, etc.) within the limits of the work as outlined on the Contact Drawings as the **initial** item of the Work. Results shall be submitted to the Engineer and all other Prime Contractors.
- RR. The Contractor shall conduct work between the hours of 7:00 a.m. and 5:00 p.m., Monday through Friday, unless required to work alternate hours per the approved Highway Occupancy Permit (HOP) (as applicable) or Maintenance and Protection of Traffic (MPT) Plan. Saturday work will be considered upon written notice to the Municipality and/or Engineer no later than forty-eight (48) hours before the Saturday in question. Under no circumstances will work be permitted on Sunday or on nationally recognized holidays. All required alternate hours, including night work, shall be included in the bidding item considered most appropriate by the Contractor. No additional compensation will be considered for night work hours.
- SS. 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 **responsive** Bidder. The Owner reserves the right to request additional information during the Bid evaluation process to determine if this requirement will be met. Failure to comply with this requirement at any time during prosecution of the Work may be considered as grounds for termination by the Owner.
- TT. The Contractor's attention is called to the fact that utility lines, including, but not limited to gas, cable television, electric and water lines are on or under the site. 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 all marked lines using whatever means necessary well in advance of work in order for the Engineer to adjust the proposed construction in case of conflict. In addition, the Contractor's attention is called to the fact that overhead lines, guy wires and poles exist within the project limits. The Contractor shall be responsible for coordinating activities with the appropriate Facility Owner(s) and arrange for the replacement and/or support of overhead lines, guy wires and poles as necessary. All costs associated with full compliance with these requirements regarding replacement and/or support of overhead lines, guy wires and poles, including detailed plans and designs if required by Facility Owner(s), shall be included in the bid item(s) considered most appropriate by the Contractor. No additional compensation will be considered for any cost associated (including hydroexcavation) for full compliance with this Paragraph. The Contractor shall also be required to contact Property Owners as required to mark all private lines.

- UU. Damage caused by the Contractor to public storm or sanitary sewers (including house laterals) shall be repaired at the Contractor's sole cost and expense in accordance with the Facility Owner's most current Construction Standards.
- VV. 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. Changes to the Contract time may be considered in this event but under no circumstances will additional compensation be considered.
- WW. The Contractor agrees that he will, at his sole cost and expense, repair and/or replace all defective work and all other damages thereby, which become defective during the term of the Maintenance Bond.
- XX. The use of tracked machines on public roadways will be prohibited outside of what is required to cross said roadway within the limits of storm and sanitary sewer work shown on the Drawings. The width of disturbance for crossing the public roadways will be a maximum of ten (10') feet. Moving tracked machines on public roadways without the use of a low-boy trailer is strictly prohibited unless written permission is granted by the Owner and/or Engineer.
- YY. Machines with rubber tracks/tires shall be used when traveling over driveways, sidewalks, etc. to minimize damage.
- ZZ. Shop drawings shall be provided for review and approval by the Engineer prior to ordering materials. All materials shall meet PennDOT Specifications in addition to these Specifications. No material may be ordered or incorporated into the Work without express written approval of the Owner and/or Engineer. The Owner and/or Engineer reserve the right to direct unapproved material off-site at no additional cost to the Owner.
- AAA. Bidders shall note the following definitions and procedures:
1. Materially unbalanced bid - A bid that generates a reasonable doubt that award to the Bidder submitting a mathematically unbalanced bid will result in the lowest ultimate cost to the Borough.
  2. Mathematically unbalanced bid – A bid containing lump sum or unit price bid items that do not reflect reasonable anticipated actual costs of labor, equipment, materials, plus a reasonable proportionate share of the Bidder's anticipated profit, overhead costs, and other indirect costs.
  3. Major and minor bid items – A major bid item is a bid item whose total cost, determined by multiplying the bidding schedule quantity and bid unit price, is equal to or greater than either five (5%) percent of the total amount of the bid or fifty thousand (\$ 50,000.00) dollars. Other bid items are minor bid items.
  4. Unbalanced bid analysis – Unbalanced pricing is defined as pricing that is one hundred (100%) percent above or fifty (50%) percent below the Engineer's Opinion of Cost for major bid items and two hundred (200%) percent above or seventy-five (75%) percent below the Engineer's Opinion of Cost for minor bid items.
- BBB. The Municipality reserves the right, at its sole discretion, to reject any bid found to be unbalanced; to reject all bids; and/or to negotiate with the apparent low bidder for the limited purpose of correcting what the Municipality has indicated in writing appears to be an imbalance among bid items provided the overall bid price remains the same.

CCC. Aggregate bedding in the "pipe zone" shall not be placed until the exposed pipe has been inspected and approved by the Owner and/or the Engineer's Representative. Backfilled pipe may be subject to re-excavation to allow for inspection at no additional cost to the Owner.

DDD. No verbal or oral interpretation will be made to any Bidder as to the meaning of Contract Documents or any part thereof. All requests for such an interpretation must be posted to PennBid. Any inquiry posted to PennBid three (3) or more working 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 and posted to PennBid at least one (1) working day before bids are opened.

All posted replies shall be acknowledged according to the PennBid site requirements and shall become part of the Contract Documents, whether acknowledged or not.

Bidders shall also note that written questions will only be accepted who attended the Mandatory Pre-Bid Meeting. Questions from suppliers, subcontractors, etc. will not be given consideration.

EEE. All Bidders shall acquaint themselves, 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.

FFF. The Contractor awarded "Contract No. 1 – Base Bid General Construction" shall be considered the General Contractor and/or Project Coordinator and be responsible for the coordination and scheduling of all construction activities on the site as well as coordination with the Contractors awarded the "Contract for Electrical Work"; "Contract for Plumbing Construction"; and the "Contract for Mechanical Construction". All references to "Contractor" or "Bidder" within the Contract Documents shall apply equally to the contractor awarded the "General Construction" contract as well as all other Contracts. The General Contractor and/or Project Coordinator shall also be responsible to provide temporary facilities and all site control fencing and security; provide general control of the overall site; and provide general project management as required for the efficient and timely completion of the Work. Payment for items such as "Mobilization", "Bonds and Insurances", etc. shall not exceed ten (10%) percent of the total Contract Price (or \$ 50,000.00 whichever is smaller) and will be paid as a percentage of the total value of the work completed. Bidders shall also follow all language found in Paragraph 1.3.AAA of this Section.

- GGG. All Bidders for Contract Nos. 2, 3, and 4 shall submit with their Bid a Schedule of Values (SOV) per Article 2 of the General Conditions that allocate portions of the Bid to various items of the Work. The SOV must correspond to the Bid Amount for the Bid to be considered as **responsive**. The SOV will be used as the basis of payment for preparing, reviewing, and approving the Contractor's Applications for Payment. Payment for items such as "Mobilization", "Bonds and Insurances", etc. shall not exceed ten (10%) percent of the total Contract Price (or \$ 50,000.00 whichever is smaller) and will be paid as a percentage of the total value of the work completed. Bidders shall also follow all language found in Paragraph 1.3.AAA of this Section.
- HHH. Trenches within travel lanes not subject to complete closure will not be opened to traffic unless a temporary or permanent bituminous surface is in place. An aggregate surface at final grade will not be allowed as a travel lane. Additional compensation for compliance with this Paragraph will not be considered. Use of road plates shall in the PennDOT right-of-way will be as listed on the approved Highway Occupancy Permit (as applicable).
- III. The Contractor **shall** provide all construction surveying services, material and equipment needed to stake, mark, reference and monitor the project from survey information provided by the Owner. The Contractor **shall** employ a Professional Land Surveyor or Professional Engineer, registered in Pennsylvania, qualified in the use of plans, cross sections and specifications; and procedures for establishing line and grade, structure locations, and dimensions, as may be required. The Contractor **shall** assume full responsibility for dimensions and elevations taken from control stakes and for the setting of structure location and line and grade stakes. The Contractor **shall** provide required final construction documentation upon completion of the project. The Contractor **shall** verify provided survey information and immediately notify the Owner of any error, omission, or discrepancy upon discovery. In addition, the Contractor **shall** provide the Engineer all necessary survey and elevation information on a timely basis as required elsewhere in the Contract Documents.
- JJJ. All excavation, including trench excavation, structure excavation and subbase removal, shall be considered as unclassified. No additional compensation, other than time, will be considered in the event that rock, concrete, cobblestone, streetcar tracks, additional paving brick, muck, slag, or any other subsurface material is encountered during the performance of the Work.
- KKK. 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.
- LLL. 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
- Note that KKK and LLL above will control if the executed Agreement does not contain the updated language.

## 1.4 PRE-CONSTRUCTION CONFERENCE

- A. Conduct conference at the Municipal Building to review methods and procedures related to the Work to be completed including, but not limited to, the following:
  - 1. Review of construction methods and existing site conditions.
  - 2. Required submittals during the course of the project.
  - 3. Submittal of twenty-four (24)-hour 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 resident notification and coordination requirements.
  - 6. Review utility notification and coordination requirements.
  - 7. Review payment procedures.
  - 8. Review Work Suspension Procedures.
- B. Review and finalize protection requirements, traffic control procedures and notification requirements.

## 1.5 CONSTRUCTION DOCUMENTATION

- A. Sufficiently detailed photographs and/or videotape, of existing conditions of trees and plantings, structures and other site improvements that might be misconstrued as damaged by the Work to be completed shall be submitted to the Engineer for review and approval prior to beginning construction. No work may begin until this requirement has been met. Payment for compliance with this requirement shall be included in the bid item deemed most appropriate by the Contractor or under the listed Bid Item as applicable.
- B. Photographic or Video Documentation **must** be submitted by a professional Subcontractor with verifiable construction documentation experience. No photography or videography will be accepted **directly** from the Contractor. There will be **no** exceptions to this requirement.

## 1.6 NOTIFICATION REQUIREMENTS

- A. The Contractor shall make all necessary arrangements with property owners, the Owner and PennDOT regarding his operations, on, over, or adjacent to roads, streets, or other property.
- B. The Contractor shall complete and submit to the Engineer the PennDOT District 11 Roadwork Notification and Approval (RNA) form (if applicable) a minimum of thirty (30) days prior to beginning work. Requests for additional time or money will not be considered for compliance with this Paragraph or any delays resulting from failure to meet these requirements.
- C. The Contractor shall coordinate his activities with the local Police Department and other emergency services in the Municipality. The Contractor shall maintain safe traffic flow with minimum inconvenience to the public. Residents shall be notified in writing at least forty-eight (48) hours prior to the blocking of driveways, work on or through private property or paving operations on a given street. The Contractor shall submit to the Engineer for approval a Resident Notification Form prior to beginning Work. All residents within five hundred (500')-feet of any active work area shall be notified.

- D. The Contractor will be required to arrange with the Owner, the local School District, the Municipality's Police Department, road closures, delays, and relocation of school bus stops and routes that are necessary for the completion of the Work. The Contractor shall coordinate work with the local School District to minimize major disruptions to service.
- E. The Contractor shall strictly adhere to all listed Permit Conditions on the PennDOT Highway Occupancy Permit (HOP) (if applicable) at no additional cost the Owner.
- F. After the pre-construction meeting is held, the Contractor shall submit to the Engineer for review and approval all required resident notices. Upon approval, the Contractor shall hand deliver all approved notices to homes within the limits of work. Should the Contractor fail to notify residents in accordance with the above, a penalty of one thousand (\$ 1,000.00) dollars per home will be assessed. No exceptions to this requirement will be considered.

#### 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 Contract. 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 Owner or to third parties to inspect work areas within the project limits 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 new lines in the case of conflict. No additional compensation will be considered for realigning or relaying utilities or sewers due to conflicts with 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 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 work conducted within the State Right-of-Way (if applicable) shall be conducted under the approved Highway Occupancy Permit (HOP) Plans (as applicable). The Contractor shall be required to install all necessary traffic control devices and signage including detours; provide all required material according to PennDOT Specifications and Bulletins 14 and 15 including certifications for pipe, structures, asphalt and aggregate; furnish all necessary flagmen; perform all required PennDOT restoration and observe all working hour requirements (including night work) of the Highway Occupancy Permit (HOP) at no additional cost to the Owner. The Contractor shall note that construction within the PennDOT right-of-way shall follow the Owner's Construction Details unless otherwise specifically indicated. The Contractor shall notify the Owner and/or Engineer of conflicts between the Details shown on the PennDOT HOP Plans, the Construction Drawings, and the PennDOT RC Standards before construction for resolution by the Owner, Engineer and/or PennDOT.
- F. Bidders shall note that the project is funded in part by a Grant from the Commonwealth of Pennsylvania acting through the Commonwealth Financing Authority and that all requirements placed on the "Contractor" as listed in the "Local Share Account Grant Contract" shall be strictly adhered to at no additional cost to the Owner.
- G. The Contractor shall observe and follow the Nondiscrimination/Sexual Harassment Provision included as an Attachment in the Contract Documents.

#### 1.8 PREVAILING WAGE REQUIREMENTS AND SCHEDULE REQUIREMENTS

- A. Pennsylvania Prevailing Wage Rates **must** be paid on this Contract. The Contractor shall supply the Engineer with weekly certified payrolls or with each Application for Payment for the Application to be considered for payment. Payments may be withheld for failure to comply with this Paragraph.
- B. All Contractors shall supply the Engineer and the "Project Coordinator" with an updated Construction Schedule with each Application for Payment for the Application to be considered for payment. Payments may be withheld for failure to comply with this Paragraph. The "Project Coordinator" shall supply the Engineer with an updated "Master Schedule" with each Application for Payment.
- C. The Owner reserves the right to request an Accelerated Construction Schedule from individual Contractors if, in the Owner's sole opinion, missed time on the most current Construction Schedule was due to factors within the Contractor's control. Activities shown on the submitted Accelerated Construction Schedule shall be performed at no additional cost to the Owner. Under no circumstances will compliance with this Paragraph be considered basis for a "directed acceleration" claim.

## 1.9 COVID-19 GUIDELINES

- A. The Contractor and Subcontractor(s) shall develop and submit a Supplemental Covid-19 Safety Plan following all applicable and most current CDC, OSHA, Owner, PennDOT and Pennsylvania Department of Health guidelines prior to beginning work.
- B. No work may begin until a Supplemental Covid-19 Safety Plan is approved by the Owner and/or PennDOT.
- C. All other Conditions as listed on the Highway Occupancy Permit (HOP) (if applicable), including Supplements, regarding Covid-19 shall be strictly followed at no additional cost to the Owner.

## 1.10 INSPECTION (ENGINEER'S REPRESENTATIVE) SERVICES

- A. Inspection services furnished and paid for by the Owner are based on an eight (8) - 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 Contractor may work overtime after written approval of the Owner. The Contractor shall be aware that it is strictly at the discretion of the Owner as to the extent of inspection services provided for work within the Owner. All overtime inspection services shall be paid for by the Contractor in the form of a deduction from the most current Application for Payment at the prevailing Inspector rate.
- B. The regular hourly rate for an Inspector is the Owner's approved per diem rate. 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 every hour of inspection services rendered. The Contractor may not elect to work overtime or on a Saturday without inspection unless authorized in writing by the Engineer or Owner. All such additional costs for inspection services rendered as stated herein shall be deducted from the most current Application for Payment.
- C. The Contractor may not elect to work overtime or on a Saturday without inspection unless authorized in writing by the Engineer or Owner. Under this Contract, the Contractor may work four (4) ten (10)-hour days (forty (40) total hours) without incurring overtime charges. All overtime charges shall be deducted from the most current Application for Payment.

### 1.11 SUSPENSION OF WORK PROCEDURE

- 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 and/or the Engineer'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 being conducted, the Engineer's Representative has been directed to administer the following procedure to resolve the matter.

- B. The Engineer's Representative will first discuss non-compliance with the Specifications, damage, or work outside the limits of the project with the on-site Foreman.

If a resolution cannot be achieved through discussion, the Engineer's Representative will mark the limit of acceptable work and notify the on-site Foreman that any work beyond the marked scope of work will be at the Contractor's risk and subject to non-payment. In addition, the Contractor shall also be made aware that he will be responsible to repair any damage at his sole cost and expense.

- C. If marking the limits of acceptable work does not result in a resolution of the matter, the Engineer's Representative will notify the Engineer and/or Owner of the situation and request authorization to shut the project down.
- D. Upon receipt of project shut-down authorization from the Engineer and/or Owner, the Engineer's Representative will issue the on-site Foreman a formal Shut Down Notice; copies of which will be sent to the Contractor at his address of record and to the Owner. The Shut Down Notice will list those items that must be corrected for the project to proceed.
- E. If the Foreman defies the Shut Down Notice and continues to work, the police will be sent to the site to shut the project down and remove the Contractor's forces.
- F. The above procedure will be reviewed at the Pre-construction conference prior to the start of work. Execution of the Agreement by the Contractor shall indicate the Contractor's understanding and acceptance of this procedure.

### 1.12 LIQUIDATED DAMAGES / PENALTIES

- A. Bidders agree that the Work will be completed and ready for final payment in accordance with Article 15 of the General Conditions on or before October 31, 2025, or liquidated damages in the amount of one thousand dollars (\$1,000.00) 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 Bethel Park (Bethel) of actual damages, Contractors and their Sureties shall be liable to Bethel the sum of one thousand dollars (\$1,000.00) as fixed and agreed for each calendar 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. Contractors shall pay to Bethel without limiting Bethel's right to terminate Agreements for default as provided elsewhere herein.

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

## B. Penalty for failure to arrive for backup (as applicable):

1. Interruption of Existing Sewer Service: Any work conducted by the Contractor during execution of any part of this Contract which creates flooding or surcharge conditions to the system(s) and/or into or on public or private properties will be the responsibility of the Contractor and repaired at no expense to the Owner or property owner. The Contractor shall be responsible for any necessary cleaning required to restore the public/private property to its original condition, as well as restore any property improvements, at no cost to the Owner and/or property owner. The Contractor shall also be responsible for any insurance claims due to surcharges into property owner's homes due to his actions.
2. If any backup or damage as described above occurs, the Contractor will be required to arrive to the site within four (4) hours with sufficient manpower and equipment to address the issues that may be causing the conditions in the above paragraph. Damages in the amount of one hundred dollars (\$100.00) per hour will be charged until the Contractor arrives on site fully prepared to begin repair work.

## C. Penalty for failure to give proper notification:

1. After the pre-construction meeting is held, the Contractor shall submit to the Engineer for review and approval all required resident notices. Upon approval, the Contractor shall hand deliver all approved notices to homes within the five hundred (500)-feet of any proposed work area. Should the Contractor fail to notify residents in accordance with the above, a penalty of one thousand (\$ 1,000.00) dollars per home will be assessed. No exceptions to this requirement will be considered.

## D. Penalty for failure to work within the limits-of disturbance (LOD) and/or construction / permanent easements (as applicable):

1. The Contractor shall note that all proposed work areas are within residential areas and, as such, work, or material storage outside the LOD and/or construction / permanent easements will be strictly prohibited. Failure to adhere to this requirement will result in a five hundred (\$ 500.00) dollar per day penalty until such time the Contractor has corrected the condition as well as restored any areas damaged by work outside the LOD and/or construction permanent easements at his sole cost and expense.

## E. Penalty for failure to pave within time limits after milling completion (as applicable):

1. The Contractor shall begin to place all required bituminous surface(s) within five (5) working days after milling completion or a penalty of one thousand (\$ 1,000.00) per calendar day will be assessed until paving operations have begun.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01110

## SECTION 01125 - MULTIPLE CONTRACT SUMMARY

## 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 a summary of each Contract, including responsibilities for coordination and temporary facilities and controls.
- B. Specific requirements of each Contract are also indicated in individual Specification Sections and on Drawings.
- C. Related Sections include the following:
  - 1. Division 1 Section "Summary" for the Work covered by the Contract Documents, restrictions on use of the premises, Owner-occupancy requirements, and work restrictions.
  - 2. Division 1 Section "Project Management and Coordination" for general coordination requirements.
  - 3. Division 1 Section "Temporary Facilities and Controls" for specific requirements for temporary facilities and controls.

## 1.3 DEFINITIONS

- A. Permanent Enclosure: As determined by the Engineer, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

## 1.4 COORDINATION

- A. The Project Coordinator shall be responsible for coordination between the Contract No. 1 – Base Bid – General Construction; Contract No. 2 – Base Bid – Electrical Construction Contractor; Contract No. 3 – Base Bid – Plumbing Construction Contractor and Contract No. 4 – Base Bid – Mechanical Construction Contractor.
  - 1. The Contractor for Contract No. 1 – Base Bid – General Construction shall act as the Project Coordinator.

## 1.5 PROJECT COORDINATOR

- A. Project Coordinator: The Project Coordinator shall be experienced in administration and supervision of site construction and building construction, including electrical, plumbing, and HVAC.
1. Coordination activities of Project Coordinator include, but are not limited to, the following:
    - a. Provide overall coordination of the Work.
    - b. Coordinate shared access to workspaces.
    - c. Coordinate product selections for compatibility.
    - d. Provide overall coordination of temporary facilities and controls.
    - e. Coordinate, schedule, and approve interruptions of permanent and temporary utilities, including those necessary to make connections for temporary services.
    - f. Coordinate construction and operations of the Work with work performed by each Contractor and Owner's Contractors and employees.
    - g. Prepare Coordination Drawings to coordinate Work by more than (1) Contractor.
    - h. Coordinate sequencing and scheduling of the Work. Include the following:
      - 1) Initial Coordination Meeting: At earliest possible date, arrange and conduct a meeting with all Contractors for sequencing and coordinating the Work.
      - 2) Prepare a combined Contractor's Construction Schedule for entire Project. Provide a combined schedule based on individual Contractor's Preliminary Construction Schedule. Secure time commitments for performing critical construction activities from separate Contractors. Show activities of each Contract on a separate sheet. Prepare a simplified summary sheet indicating combined construction activities of Contracts.
      - 3) Distribute copies of schedules to Engineer, Owner, and separate Contractors.
    - i. Provide photographic documentation by a professional Subcontractor.
    - j. Provide quality-assurance and quality-control services specified in Division 1 Section "Quality Requirements."
    - k. Coordinate sequence of activities to accommodate and schedule tests and inspections.
    - l. Provide information necessary to adjust, move, or relocate existing utilities and structures affected by Work.
    - m. Locate existing permanent benchmarks, control points, and similar reference points, and establish permanent benchmarks on project site from data provided by the Owner.
    - n. Provide field surveys of in-progress construction and site work.
    - o. Provide progress cleaning of common areas and coordinate progress cleaning of areas or pieces of equipment where more than one Contractor has worked.
    - p. Coordinate cutting and patching.
    - q. Coordinate and provide protection of the Work and work site.
    - r. Coordinate firestopping.
    - s. Coordinate completion of interrelated punch list items.

- t. Coordinate preparation of Project Record Documents if information from more than one Contractor is to be integrated with information from other Contractors to form one (1) combined record.
  - u. Print and submit Record Drawings if installations by more than one Contractor are indicated on the same Contract Drawing or Shop Drawing.
  - v. Collect Record Specification Sections from other Contractors; collate Sections into numeric order and submit complete set.
  - w. Coordinate preparation of operation and maintenance manuals if information from more than one Contractor is to be integrated with information from other contractors to form one combined record.
  - x. Coordinate on-site required testing activities including providing adequate notice to other Contractors and Consultants.
  - y. Coordinate staging of equipment and materials on the site with other Contractors.
  - z. Coordinate deliveries of materials and equipment.
  - aa. Coordinate all hoists and lifts including those by other trades.
  - bb. Coordinate submission of submittals and ordering of equipment and items which are long lead time or whose delivery would have an impact on the Construction Schedule.
  - cc. Coordinate the overall schedule including updates to the schedule. Coordinate schedule with all Contractors.
  - dd. Compile and submit with the current Application for Payment a "Master Schedule" that includes work for all trades on the project.
  - ee. Coordinate work furnished by the Owner to efficiently complete all Work.
2. Responsibilities of Project Coordinator for temporary facilities and controls include, but are not limited to, the following:
- a. Provide common-use field office for meetings for use by all personnel engaged in construction activities.
  - b. Provide temporary lighting within building(s).
  - c. Provide all required on-site protection measures.

## 1.6 GENERAL REQUIREMENTS OF CONTRACTS

- A. Extent of Contract: Unless the Agreement contains a more specific description of the Work, names and terminology on Drawings and in Specification Sections determine which Contract includes a specific element of the Work.
- 1. Unless otherwise indicated, the Work described in this Section for each Contract shall be complete systems and assemblies, including products, components, accessories, and installation required by the Contract Documents.
  - 2. Local customs and trade-union jurisdictional settlements do not control the scope of the Work of each Contract. When a potential jurisdictional dispute or similar interruption of work is first identified or threatened, affected Contractors shall negotiate a reasonable settlement to avoid or minimize interruption and delays.
  - 3. Trenches and backfill for the Work of each Contract shall be provided by **each** Contractor for its own Work.
  - 4. Cutting and Patching: Provided by each Contractor for its own Work.

5. Through-penetration firestopping for the Work of each Contract shall be provided by the Contract No. 1 – Base Bid – General Construction Contractor.
  6. Within five (5) working days after the preliminary horizontal bar-chart-type construction schedule submittal has been received from the Project Coordinator, submit a matching preliminary horizontal bar-chart schedule showing construction operations sequenced and coordinated with overall construction.
  7. Project closeout requirements.
  8. All Contractors shall be responsible for providing an updated schedule with **each** Application for Payment. Schedule updates shall also be provided at any time when requested by the Owner or Owner's representative within five (5) working days of request. The Project Coordinator shall compile all other submitted schedules and provide the Owner and/or the Engineer with a Master Schedule.
- B. Substitutions: Each Contractor shall cooperate with other Contractors involved to coordinate approved substitutions with remainder of the Work.
1. The Project Coordinator shall coordinate substitutions.
- C. Temporary Facilities and Controls: In addition to specific responsibilities for temporary facilities and controls indicated in this Section and in Division 1 Section "Temporary Facilities and Controls," each Contractor is responsible for the following:
1. Installation, operation, maintenance, and removal of each temporary facility usually considered as its own normal construction activity, and costs and use charges associated with each facility.
  2. Plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting necessary exclusively for its own activities.
  3. Its own field office, complete with necessary furniture, utilities, and telephone service.
  4. Its own storage and fabrication sheds.
  5. Temporary enclosures for its own construction activities.
  6. General hoisting facilities for its own construction activities.
  7. Waste disposal facilities, including collection and legal disposal of its own hazardous, dangerous, unsanitary, or other harmful waste materials.
  8. Progress cleaning of its own areas daily.
  9. Secure lockup of its own tools, materials, and equipment.
  10. Construction aids and miscellaneous services and facilities necessary exclusively for its own construction activities.
- D. Temporary Heating, Cooling, and Ventilation: The Contractor for Contract No. 1 – Base Bid – General Construction is responsible for temporary heating, cooling, and ventilation **before** permanent enclosure of building is complete and mechanical equipment is installed. The Contractor for Contract No. 1 – Base Bid – General Construction is responsible for temporary heating, cooling, and ventilation after permanent enclosure of building is complete. The Owner will pay utility-use charges **after** permanent enclosure.



## E. Use Charges: Comply with the following:

1. Sewer Service: The Contractor for Contract No. 1 – Base Bid – General Construction shall include the cost for temporary sewer service, whether metered or otherwise, for sewage service used by its own forces and others engaged in construction activities at the work site. The Owner shall be responsible for usage fees to utility once new municipal sewer service is provided to the site.
2. Water Service: The Contractor for Contract No. 3 – Base Bid – Plumbing Construction shall include the cost for temporary water service, whether metered or otherwise, for water used by its own forces and others engaged in construction activities at the work site. The Owner shall be responsible for usage fees to utility once new municipal water service is provided to the site.
3. Electric Power Service: The Contractor for Contract No. 2 – Base Bid – Electrical Construction shall include **all** costs for temporary electric power service, whether metered or otherwise, for electricity used by its own forces and others engaged in construction activities at the work site. The Owner shall be responsible for usage fees to once new permanent electrical service is provided to the site and connected for use in the structure.

## 1.7 BASE BID – CONTRACT NO. 1 – BASE BID – GENERAL CONSTRUCTION

A. Work includes, but is not limited to, the following:

1. Site preparation, including clearing, building, utility and site feature demolition and relocations.
2. Site improvements including standard and heavy-duty asphalt paving; concrete including curb, sidewalk, and ADA ramps; site furnishings; landscaping and general seeding and mulching.
3. Unclassified bulk excavation including stripping, stockpiling and replacement of topsoil; off-site removal of excess material; bench and intermediate drains; rock excavation; fine grading; and all other actions required by the Geotechnical Report (not including trenches for work installed under other Contracts) (as applicable). Unclassified bulk excavation shall be paid on a strict lump sum basis regardless of listed Schedule of Value (SOV) quantities or actual quantities installed.
4. Installation of stormwater management infrastructure, piping, structures and backfill to five (5') from building(s)
5. Selective demolition.
6. Testing and inspections as described in these Specifications.
7. Providing field measurements and assistance to the Owner for ordering of all products purchased by Owner. Provide unloading and storage for all products purchased by Owner.
8. Foundations, including footings, foundation walls.
9. Slabs-on-grade, including earthwork, subdrainage systems, and insulation.
10. Below-grade building construction, including excavation, backfill, and thermal and moisture protection.
11. Superstructure, including wall, floor, and roof construction.
12. Exterior closure, including facades, doors, windows, and trim.

13. Roofing, including coverings, flashing, mechanical equipment screenings (including roof-top) and downspouts, gutters, downspout boots and cleanouts and connection to storm system.
14. Interior construction, including partitions, doors, finishes and fittings.
15. Fire-protection specialties.
16. Interior finishes.
17. Restroom accessories.
18. Miscellaneous items, including concrete equipment bases and painting of mechanical and electrical work.
19. Conveying systems, including cranes.
20. Testing and inspections as described in these Specifications.
21. All other activities required to produce a complete-in-place installation according to the Contract Documents as determined by the Contactor.

B. Temporary facilities and controls in this Contract include, but are not limited to, the following:

1. Temporary facilities and controls that are not otherwise specifically assigned to the other Contracts.
2. Erosion and Sediment Control (E and SC) measures
3. Un-piped sewers and drainage, including drainage ditches and ponds.
4. Stormwater control, including temporary bypass of existing stormwater piping.
5. Un-piped temporary toilet fixtures and wash facilities, including disposable supplies for all work forces (All other Contractors and Owner's Contractors and own forces).
6. Temporary access roads.
7. Dewatering facilities and drains.
8. Excavation support and protection, unless required solely for the Work of another Contract.
9. Special or unusual hoisting requirements for own construction activities, including hoisting loads in excess of two (2) tons, hoisting material or equipment into spaces below grade, and hoisting requirements outside building enclosure.
10. Project identification and temporary signs.
11. General waste disposal facilities.
12. Temporary toilet facilities for use by all Contracts
13. Pest control.
14. Temporary stairs.
15. Temporary fire-protection equipment.
16. Barricades, warning signs, and lights.
17. Site enclosure fence.
18. Security enclosure and lockup.
19. Environmental protection.
20. Restoration of Owner's existing facilities used as temporary facilities.
21. Temporary site lighting.
22. Temporary enclosure for building exterior, except as indicated.

## 1.8 CONTRACT NO. 2 – BASE BID - ELECTRICAL CONSTRUCTION

- A. Work in this Contract includes, but is not limited to, the following:
1. Demolition of site electrical.
  2. Site electrical distribution.
  3. New electrical service installation (primary service, transformer, secondary service)
  4. Site lighting for parking lot (including conduit, wires, foundations, poles, and fixtures).
  5. Site lighting for building (including conduit, wires, foundations, poles, and fixtures).
  6. Electrical service and distribution.
  7. Exterior and interior lighting.
  8. Excavation and backfill for all installed work.
  9. Electrical connections to equipment furnished by the General Construction Contractor; the Plumbing Construction Contractor and the HVAC Construction Contractor.
  10. Electric service and equipment at pavilions (if applicable).
  11. Empty conduit installation (including pull-ropes) for planned future work.
  12. Permits.
  13. All other activities required to produce a complete-in-place installation according to the Contract Documents as determined by the Contactor.
- B. Temporary facilities and controls in this Contract include, but are not limited to, the following:
1. Electric power service and distribution.
  2. Temporary electrical power for all construction forces
  3. Electrical connections to existing systems and temporary facilities and controls furnished by all other Contractors including Owner's Contractors and own forces.
  4. Temporary site lighting.
- C. Hoisting requirements for own construction activities, including hoisting equipment onto roof.

## 1.9 CONTRACT NO. 3 – BASE BID – PLUMBING CONSTRUCTION

- A. Work in the Plumbing Contract includes, but is not limited to, the following:
1. Site water supply and distribution.
    - a. Connection to water main
    - b. Proposed water meter vault (if applicable)
    - c. Water distribution line to proposed pavilion (if applicable)
    - d. Yard hydrants (if applicable)
  2. Site sanitary sewerage.
  3. Building plumbing and fixtures.
  4. Domestic water distribution.
  5. Sanitary waste.
  6. Building(s) perimeter RWL storm piping to five (5')-feet outside of building(s)
  7. Connection to storm sewer piping installed by General Construction Contractor
  8. Water supply line and sanitary connections
  9. Excavation and backfill for all installed work.

10. Plumbing connections to equipment furnished by furnished by all other Contractors including Owner's Contractors and own forces.
11. All required permits and inspections

B. Temporary facilities and controls in the Plumbing Contract include, but are not limited to, the following:

1. Plumbing connections to existing systems and temporary facilities and controls furnished by all other Contractors including Owner's Contractors and own forces.
2. Temporary plumbing connections to permanent system for use by other Contractors for construction activities once permanent system is in place.
3. Temporary bypass and/or pumping of existing sanitary sewers.
4. Hoisting requirements for own construction activities, including hoisting equipment onto roof.

1.10 CONTRACT NO. 5 – BASE BID – HVAC CONSTRUCTION

A. Work in this Contract includes, but is not limited to, the following:

1. HVAC systems and equipment.
2. HVAC instrumentation and controls.
3. HVAC testing, adjusting, and balancing.
4. Louvers for exhaust fans.
5. HVAC control systems
6. Mechanical connections to equipment furnished by all other Contractors including Owner's Contractors and own forces.

B. Temporary facilities and controls in the Mechanical Contract include, but are not limited to, the following:

1. Mechanical connections to existing systems and temporary facilities and controls furnished by all other Contractors including Owner's Contractors and own forces.
2. Hoisting requirements for own construction activities, including hoisting equipment onto roof.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01125

## SECTION 01210 - ALLOWANCES

## 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 governing allowances.
  - 1. Certain items are specified in the Contract Documents by allowances (as applicable). Allowances have been established to account for unforeseen or additional work required for successful completion of the project that are not shown or specified on the Contract Documents. If necessary, additional requirements will be issued by Change Order.
- B. Types of allowances include the following:
  - 1. Contingency allowances.
- C. Related Sections include the following:
  - 1. Division 1 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders for allowances.
  - 2. Division 1 Section "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.
  - 3. Divisions 2 through all other Sections for items of Work covered by allowances.

## 1.3 SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.
- B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

## 1.4 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

## 1.5 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Engineer for the Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for work completed under the contingency allowances are to be included in the Contractor's submitted bid and shall be clearly identified in the Contractor's schedule of values as separate line items. These costs include delivery, installation, taxes, insurance, equipment rental, and all other costs necessary to complete the work.
- C. The Engineer shall have the right to reject the Contractor's stated allowance value on the Schedule of Values at the sole discretion of the Engineer. The Contractor's allowance shall be fair and reasonable for the work being performed.
- D. Payment for work completed under a Contingency Allowance shall be paid for as a percentage of the units of work completed relative to the units as part of the Contingency. The quantity of work completed shall be verified by the Engineer.
- E. An executed Change Order shall be authorized prior to the use of funds beyond the contingency amount.
- F. At project closeout, credit unused amounts remaining in the contingency allowance to the Owner by Change Order.

## PART 2 - EXECUTION

## 2.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

## 2.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

## 2.3 SCHEDULE OF ALLOWANCES

- A. Allowances for Base Bids and Additional Bids (if applicable) will be developed as necessary and issued by Addendum **prior** to bidding.

END OF SECTION 01210

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01210 ALLOWANCES

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## SECTION 01250 - CONTRACT MODIFICATION PROCEDURES

## 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 specifies administrative and procedural requirements for handling and processing Contract modifications.

## 1.3 MINOR CHANGES IN THE WORK

- A. The 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: The Owner 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 the Owner are for information only. The Contractor shall not consider them instructions either to stop the work in progress or to execute the proposed change.
  - 2. Within five (5) working days after receipt of Proposal Request, the Contractor shall submit a Proposal including adjustments to the Contract Sum and the Contract Time as required to perform the change. The Proposal shall include, but be not limited to, the following:
    - a. A summary of items required or eliminated with unit costs calculated according to all applicable General and Supplemental Conditions listing additions or deletions to the Contract Sum. If requested, the Contractor shall furnish survey data to substantiate listed quantities.
    - b. An updated Construction Schedule indicating the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship.
  - 3. All applicable Contract language, including approval of submitted Proposals, shall apply to this Paragraph. If a price cannot be agreed upon **prior** to beginning work, the directed work shall be performed as Constructive Change Directive work.

- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, the Contractor may request changes by submitting a written request to the Owner and/or Engineer. All time requirements must be met by the Contractor for the Owner and/or Engineer to consider the Proposal. The Proposal shall include, but be not limited to, the following:
1. A statement providing a detailed description of the reason for the change and the effect of the change on the Contract Sum and/or the Contract Time.
  2. A summary of items required or eliminated with unit costs calculated according to all applicable General and Supplemental Conditions listing additions or deletions to the Contract Sum. If requested, the Contractor shall furnish survey data to substantiate listed quantities.
  3. An updated Construction Schedule indicating the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship.

#### 1.5 CHANGE ORDER PROCEDURES

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

#### 1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: The Construction Change Directive will be issued by the Owner and/or Engineer and will instruct the Contractor to proceed with a change in the Work for subsequent inclusion in a Change Order.
1. The Construction Change Directive will contain a complete description of changes in the Work. It will also designate the method to be followed to determine changes in the Contract Sum and/or the Contract Time.
- B. Documentation: The Contractor shall maintain detailed records on a time and material basis of the work required by the Construction Change Directive.
1. After completion of work required by the Construction Change Directive, the Contractor shall submit to the Owner and/or the Engineer an itemized account with all necessary supporting data to **fully** substantiate cost and time adjustments to the Contract.
  2. Submitted supporting documentation shall be reviewed and approved by the Engineer **prior** to inclusion as a Change Order. All other applicable Contract provisions shall apply in the event the Engineer does **not** approve the submitted documentation.

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, 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 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 APPLICATIONS FOR PAYMENT

- A. The Contractor shall utilize Contractor's Application for Payment (Section 00620) to request payments for completed work. Estimates on other forms will **not** be accepted or considered for payment. Section 00620 will be sent electronically to the Contractor upon written request.
- B. The Contractor shall submit a "pencil copy" of the most current Application for Payment to the Owner and/or Engineer (or his authorized Representative) for review prior to submittal for payment. All quantities shall be agreed to prior to any action by the Owner and/or Engineer. Disputed quantities shall **not** be included on submitted Applications.
- C. Each Application for Payment shall be consistent with previous applications and payments as certified by the Engineer and paid by the Owner.
- D. Payment Application Times: The date for each progress payment shall be indicated in the Agreement between the Owner and the Contractor and/or mutually agreed upon. The period of Work covered by each Application for Payment shall be indicated in the Agreement or mutually agreed upon. "General Conditions" requirements regarding payment times will not apply to this Contract.
- E. Transmittal: Submit three (3) signed original copies of each Application for Payment to the Engineer. One copy shall include Waivers of Liens and all other required attachments.
- F. Certified Payrolls: Each Application for Payment **must** be accompanied by the corresponding Certified Payrolls for all Contractors and Subcontractors. Failure to submit Certified Payrolls will result in the Owner delaying consideration of payment until the submittal of all required Payrolls.

- G. Updated Schedules: Each Application for Payment **must** be accompanied by an updated schedule for all Contractors and Subcontractors. Failure to submit an updated schedule will result in the Owner delaying consideration of payment until the submittal of all required Schedules.
- H. Waivers of Mechanic's Lien: Submit a Waiver of Mechanic's Lien from every entity who is lawfully entitled to file a Mechanic's Lien on the Contract and related to the Work covered by the payment with **each** Application for Payment. Failure to submit a Waiver of Mechanic's Lien will result in a delay of payment processing by the Municipality. The Contractor may submit a "Partial or Conditional Waiver and Release of Mechanics Lien Claims", on a form acceptable to the Owner, indicating that all Subcontractors and Suppliers entitled to payment for work performed under the current Application for Payment have been or will be paid. The form shall clearly state that any action taken by Subcontractors and Supplies against the Owner will be defended and indemnified in full by the Contractor.
- I. Accelerated Schedule: The "Base Bid – General Construction" Contractor shall submit an Accelerated Schedule if requested by the Owner and/or Engineer. No "directed acceleration claim" will be considered if, in the Owner's sole opinion, work was delayed by factors within the Contractor's control. All work under the Accelerated Schedule shall be performed at no additional cost to the Owner.
- J. Initial Application for Payment: Actions and submittals that must precede the initial Application for Payment include, but are not limited to, the following:
1. List of Subcontractors.
  2. Construction Schedule.
  3. Schedule of Values for all Lump Sum bid items.
  4. Pre-construction Photography and/or Videography by a professional Subcontractor.
  5. All Required Submittals including Schedule of Values (SOV) for lump sum items.
  6. Certificates of Insurance.
  7. Performance and Payment Bonds.
- K. 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. All final documentation called for in the Contract Documents.
  2. Updated Final Payment Application accounting for all changes to the Contract Sum and Contract Time.
  3. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims".
  4. AIA Document G706A, "Contractor's Affidavit of Release of Liens".
  5. AIA Document G707, "Consent of Surety to Final Payment".
  6. Satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to the Owner free and clear of any Liens or other title defects that will pass upon Final Payment.
  7. A list of all disputes (if any) the Contractor believes are unsettled.
  8. Complete and legally effective releases or waivers (satisfactory to the Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
  9. Final Completion Photography and/or Videography.
  10. As-built drawings following all requirements listed elsewhere in the Contract Documents.
  11. All applicable product and manufacturers warranties.

12. Post-construction NASSCO CCTV of all installed piping (as applicable).
13. A two (2) year Maintenance Bond in the amount of fifty percent (50%) of the Final Contract Sum on a form acceptable to the Owner dated from the day of final **acceptance** of the work by the Owner regardless of the time of completion of the physical work.
14. An acknowledgment letter from the Contractor agreeing to perform required NASSCO televising of all installed sewer prior to the release of the two (2) year Maintenance Bond. This letter shall also indicate the Surety's consent to this requirement.
15. Evidence of compliance with all start-up, testing and permitting requirements.
16. An acknowledgement letter from the Contractor agreeing to perform required NASSCO televising of all installed sanitary and storm sewers prior to the release of the two (2) year Maintenance Bond (if applicable). This Letter shall also indicate the Surety's consent to this requirement

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01290

## SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION

## 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 provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. Coordination Drawings.
  - 2. Administrative and supervisory personnel.
  - 3. Project meetings.
  - 4. Requests for Interpretation (RFIs).
- B. Each Contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific Contractor.
- C. Related Sections include the following:
  - 1. Division 1 Section "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule.
  - 2. Division 1 Section "Closeout Procedures" for coordinating closeout of the Contract.

## 1.3 DEFINITIONS

- A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

## 1.4 COORDINATION

- A. The Owner relies upon the organization, management, skill, cooperation, and efficiency of the Contractor to supervise, direct, control and manage the Work and the efforts of his/her employees and all Sub-Contractors. The Contractor is required to have a competent Foreman on-site at all times, including during work performed by Subcontractors, to receive orders and directions from the Owner and/or the Owner's Representative. The on-site Foreman shall be clothed with full authority by the Contractor to execute all given orders without delay and make all necessary arrangements for carrying out the Work.

- B. Coordination: The Contractor shall coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  2. Coordinate installation of different components with other entities to ensure maximum accessibility for required maintenance, service, and repair.
  3. Make adequate provisions to accommodate items scheduled for later installation.
  4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components.
- C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner and other entities, if coordination of their Work is required.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other entities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's Construction Schedule.
  2. Preparation of the Schedule of Values (for lump sum items).
  3. Installation and removal of temporary facilities and controls.
  4. Delivery and processing of submittals.
  5. Progress meetings.
  6. Pre-construction conferences.
  7. Project closeout activities.
  8. Adjustment of facilities.
  9. As-Built Preparation.
  10. Project closeout activities.
- E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

## 1.5 SUBMITTALS

- A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:
    - a. Indicate functional and spatial relationships of components.
    - b. Indicate required installation sequences.
    - c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Engineer for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
  2. Sheet Size: At least eight and one-half (8.5") inches by eleven (11") inches but no larger than thirty (30") inches by forty (40") inches.
  3. Number of Copies: Submit two (2) opaque copies of each submittal. Engineer will return one (1) stamped copy.
  4. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.
- B. Key Personnel Names: Prior to starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to project.
1. Keep list current at all times.

## 1.6 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. General: In addition to on-site Project Foreman, provide other administrative and supervisory personnel as required for proper performance of the Work.
1. Include special personnel required for coordination of operations with other entities.

## 1.7 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at project site, unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify the Owner and Engineer of scheduled meeting dates and times.
  2. Agenda: The Contractor shall prepare the Meeting Agenda. Distribute the Agenda to all invited attendees.
  3. Minutes: The Contractor shall record significant discussions and agreements achieved. Distribute the Meeting Minutes to all interested parties, including the Owner and Engineer, within three (3) days of the Meeting.
- B. Pre-construction Meeting: Schedule a Pre-construction Meeting **before** starting construction, at a time convenient to the Owner and Engineer but no later than five (5) days after execution of the Agreement. Hold the Meeting at the Municipal Building. Conduct the Meeting to review responsibilities and personnel assignments.
1. Attendees: Authorized representatives of the Owner, the Engineer and their Consultants; the Contractor and its foreman; major Subcontractors; Suppliers; Washington County Conservation District Representatives; PennDOT Representatives (as applicable); Utility Representatives and all other concerned parties shall attend the Meeting. All participants at the Meeting shall be familiar with the project and authorized to conclude matters relating to the Work.
  2. Agenda: Discuss items of significance that could affect progress, including, but not limited to, the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Procedures for processing field decisions and Change Orders.
    - f. Procedures for RFIs.
    - g. Procedures for testing and inspecting.
    - h. Procedures for processing Applications for Payment.
    - i. Distribution of the Contract Documents.
    - j. Submittal procedures.
    - k. Preparation of Record Documents.
    - l. Use of the premises.
    - m. Work restrictions.
    - n. Owner's occupancy requirements.
    - o. Responsibility for temporary facilities and controls.
    - p. Construction waste management and recycling.
    - q. Parking availability.
    - r. Office, work, and storage areas.
    - s. Equipment deliveries and priorities.
    - t. Safety.
    - u. Site security.
    - v. Progress cleaning.
    - w. Working hours.

3. Minutes: The Engineer will record and distribute meeting minutes.
- C. Pre-installation Conferences: Conduct a Pre-installation Conference at the project site before each construction activity that requires coordination with other construction or other entities.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the Conference. Advise the Engineer of scheduled meeting dates.
  2. Agenda: Review progress of other construction activities and preparations for the activity under consideration, including requirements for the following:
    - a. Contract Documents.
    - b. Options.
    - c. Related RFIs.
    - d. Related Change Orders.
    - e. Purchases.
    - f. Deliveries.
    - g. Submittals.
    - h. Review of mockups.
    - i. Possible conflicts.
    - j. Compatibility problems.
    - k. Time schedules.
    - l. Weather limitations.
    - m. Manufacturer's written recommendations.
    - n. Warranty requirements.
    - o. Compatibility of materials.
    - p. Acceptability of substrates.
    - q. Temporary facilities and controls.
    - r. Space and access limitations.
    - s. Regulations of authorities having jurisdiction.
    - t. Testing and inspecting requirements.
    - u. Installation procedures.
    - v. Coordination with other work.
    - w. Required performance results.
    - x. Protection of adjacent work.
    - y. Protection of construction and personnel.
  3. The Contractor shall record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  4. Reporting: Distribute minutes of the Conference to each party present and to parties who should have been present.
  5. Do not proceed with installation if the Conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to the performance of the Work and reconvene the conference at the earliest feasible date.



- D. Progress Meetings: Conduct Progress Meetings at weekly (or as otherwise required or designated) intervals. Coordinate dates of meetings with preparation of payment requests.
1. Attendees: In addition to representatives of the Owner and the Engineer; the Contractor; all Subcontractors, Suppliers, and all other entities concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the Meeting shall be familiar with the project and authorized to conclude matters relating to the Work.
  2. Agenda: Review and correct or approve Minutes of previous Progress Meetings. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of Project.
    - a. Contractor's Construction Schedule: Review progress from the last Meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time. Provide an Accelerated Schedule if requested.
      - 1) Review schedule for next period.
    - b. Review the present and future needs of each entity present, including the following:
      - 1) Interface requirements.
      - 2) Sequence of operations.
      - 3) Status of submittals.
      - 4) Deliveries.
      - 5) Off-site fabrication.
      - 6) Access.
      - 7) Site utilization.
      - 8) Temporary facilities and controls.
      - 9) Work hours.
      - 10) Hazards and risks.
      - 11) Progress cleaning.
      - 12) Quality and work standards.
      - 13) Status of correction of deficient items.
      - 14) Field observations.
      - 15) RFIs.
      - 16) Status of proposal requests.
      - 17) Pending changes.
      - 18) Status of Change Orders.
      - 19) Pending claims and disputes.
      - 20) Documentation of information for payment requests.
  3. Minutes: The Engineer will record and distribute the Meeting Minutes.

4. Reporting: Distribute Meeting Minutes to each party present and to all parties who should have been present.
  - a. Schedule Updating: Revise Contractor's Construction Schedule after each Progress Meeting where revisions to the schedule have been made or recognized. Issue revised Schedule concurrently with the report of each Meeting.
- E. Coordination Meetings: Conduct Project Coordination Meetings weekly or as required by the Contractor. Project Coordination Meetings are in addition to specific meetings held for other purposes, such as Progress Meetings and Pre-installation Conferences.

#### 1.8 REQUESTS FOR INTERPRETATION (RFIs)

- A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project Meeting, prepare and submit an RFI in the form specified.
  1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
  2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of Subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
  1. Project name.
  2. Date.
  3. Name of Contractor.
  4. Name of Engineer
  5. RFI number, numbered sequentially.
  6. Specification Section number and title and related paragraphs, as appropriate.
  7. Drawing number and detail references, as appropriate.
  8. Field dimensions and conditions, as appropriate.
  9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  10. Contractor's signature.
  11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
    - a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.
- C. Hard-Copy RFIs:
  1. Identify each page of attachments with the RFI number and sequential page number.

- D. Software-Generated RFIs: Software-generated form with substantially the same content as indicated above.
1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- E. Engineer/Owner Action: Engineer/Owner will review each RFI, determine action required, and return it. Allow five (5) working days for Engineer/Owner's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for coordination information already indicated in the Contract Documents.
    - d. Requests for adjustments in the Contract Time or the Contract Sum.
    - e. Requests for interpretation of Engineer's actions on submittals.
    - f. Incomplete RFIs or RFIs with numerous errors.
  2. The Engineer's action may include a request for additional information, in which case the Engineer's time for response will start again.
  3. The Engineer's action on RFIs that may result in a change to the Contract Time, or the Contract Sum may be eligible for the Contractor to submit Change Proposal according to Division 1 Section "Contract Modification Procedures."
    - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer and Owner in writing within five (5) working days of receipt of the RFI response.
- F. On receipt of Engineer/Owner's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify the Engineer/Owner within five (5) working days if Contractor disagrees with response.
- G. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number.
1. Project name.
  2. Name and address of Contractor.
  3. Name and address of Engineer/Owner
  4. RFI number including RFIs that were dropped and not submitted.
  5. RFI description.
  6. Date the RFI was submitted.
  7. Date Engineer/Owner's response was received.
  8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
  9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01310

## 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 SCHEDULE AND DAILY CONSTRUCTION REPORTS

- A. Construction Schedule: The Contractor shall submit three (3) copies of their proposed Construction Schedule to the Engineer a maximum of five (5) working days after Notice of Award (NOA). No work may begin until the Construction Schedules have been reviewed and approved by the Engineer. The Contractor for "Base Bid – Essential Site Infrastructure" shall compile all Subcontractors' schedules and submit a "Master Schedule" for the project.
- 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 the initial Schedule with first set of submittals or as listed elsewhere in these Specifications; an updated Schedule with each Application for Payment for payment consideration; and an Accelerated Schedule as requested by the Owner.
- F. Accelerated Schedule: Submit Accelerated Schedule as requested by Owner. No “directed acceleration claim” will be considered if, in the Owner’s opinion, work was delayed by factors within the Contractor’s control. All work under the Accelerated Schedule shall be performed at no additional cost to the Owner.
- G. Schedule Coordination and Development: The Contractor for “Base Bid – General Construction” shall act as the “Project Coordinator” compile all Subcontractors’ schedules and develop and submit a “Master Schedule” at no additional cost to the Owner.

END OF SECTION 01320

## SECTION 01322 – PHOTOGRAPHIC OR VIDEO 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 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 DEFINITIONS

- A. Contractor: "Contractor" shall be taken to be an experienced Subcontractor with verifiable construction documentation experience for purposes of this Section. Other outlined requirements, such as staking limits of photography, shall be performed by the successful Bidder (Contractor) prior to performing construction documentation activity. No documentation will be accepted directly from the successful Bidder (Contractor) unless indicated otherwise in the Contract Documents or agreed to in writing by the Owner.
- B. Successful Bidder: "Successful Bidder" shall be taken to be the Contractor awarded the Contract for Contract No. 1 – Base Bid – General Construction.

## 1.4 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 twelve (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 unsatisfactory 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 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 all other pertinent information.



- C. Camera: The color video camera used in the recording system shall have a horizontal resolution of three hundred (300) lines at center, a luminance signal to noise ratio of 45db, and a minimum illumination requirement of twenty-five (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 should 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 a product acceptable to the Owner. The Owner may direct the Contractor re-video the site (or portion thereof) at no additional cost if, in the sole opinion of the Owner, the video is deemed unacceptable.
- 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 ensure 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 Limits of Disturbance (LOD) and/or permanent easements and/or construction easements 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 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 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 LOD and/or construction easements and/or permanent easements before taking construction photographs. Notify Owner and Engineer a minimum of forty-eight (48)-hours in advance of beginning pre-construction photography. All residents affected 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 Engineer for approval prior to beginning work. Do not begin construction without Owner and/or Engineer 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) days' 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 Engineer for approval prior to beginning work. Do not begin construction without Owner and/or Engineer approval of photography.
- I. Payment for photography other than pre-construction and final completion 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 Limits of Disturbance (LOD) and/or permanent easements and/or construction easements 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 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 should 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 a video of the project site and surrounding properties, including existing items to remain during construction, from different vantage points.
1. Flag and or mark LOD and/or construction easements and/or permanent easements before taking pre-construction video. Notify Owner and Engineer a minimum of forty-eight (48)-hours in advance of beginning pre-construction recording. All residents affected 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 Engineer for approval prior to beginning work. Do not begin construction without Owner and/or Engineer 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 videos 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 Engineer for approval prior to beginning work. Do not begin construction without Owner and/or Engineer approval of video.
- I. Payment for video other than pre-construction and final completion video will be paid under applicable Contract provisions.

END OF SECTION 01322

## SECTION 01330 - SUBMITTAL PROCEDURES

## 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 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. Divisions 2 Sections and all other Sections for specific requirements for submittals in those Sections.

## 1.3 DEFINITIONS

- A. Informational Submittals: Written information that does not require Borough responsive action. Submittals may be rejected for not complying with requirements.

## 1.4 SUBMITTAL PROCEDURES

- A. Submit each submittal with fabrication, purchasing, delivery, other submittals, and related activities that require sequential activity.
- B. Processing Time: Allow sufficient time for submittal review, including time for re-submittals, as follows. Time for review shall commence on the Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals in advance of the Work to permit processing, including re-submittals. Transmit required submittals a maximum of ten (10) working days after Notice of Award (NOA).
  - 1. Initial Review: Allow ten (10) working days for initial review.
  - 2. Intermediate Review: Process intermediate reviews in the same manner as initial reviews.
  - 3. Re-submittal Review: Allow ten (10) working days for review of each re-submittal.

- C. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate the name of firm or entity that prepared each submittal on label or title block.
  2. Provide a space approximately three (3") inches by four (4") inches on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
  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 and installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- G. Number: Submit at least three (3) copies of each submittal to Engineer for review. Request actual total number of required submittals from Engineer prior to initial submittal.
- H. Use for Construction: Do not order material prior to receiving submittals marked as "Accepted" or "Supply as Noted" by the Engineer. Materials ordered prior to acceptance will not be allowed to be incorporated into the Work. Costs for materials ordered prior to acceptance or replacement costs for said materials will not be considered for payment. "Supply as Noted" submittals do not require a resubmittal.

## PART 2 - PRODUCTS

## 2.1 MANDATORY SUBMITTALS

- A. The following items, at a minimum, shall be submitted to the Engineer for approval a maximum of ten (10) working days after Notice of Award and prior to ordering or installing materials. Note that this List is not meant to be all inclusive and shall be project dependent and as applicable:

1. Construction Schedule
2. Schedule of Values for all Lump Sum Items
3. Twenty-four (24)-hour Emergency Contact List
4. Resident Notification Letters
5. Subcontractor List
6. Pre-construction Photography and/or Videography by a professional Subcontractor
7. Erosion and Sedimentation Controls Materials
8. Concrete Mix Designs
9. Bituminous Mix Designs
10. Wall Material and Designs
11. Aggregate Material
12. Expansion Material
13. Concrete Sealant
14. Reinforcement and Rebar Material including chairs / supports
15. Bituminous Sealants
16. Geotextile Material
17. Storm and Sanitary Pipe, Fittings and Connectors
18. Non-shrink Grout
19. Storm Manholes, Inlets, Outlet Structures, Headwalls, and Appurtenances
20. Sanitary Manholes and Appurtenances (as applicable)
21. Waterline and Appurtenances (as applicable)
22. Seed Mix including Mulch and Supplements
23. Fencing and Railing Materials (as applicable)
24. Plant and Sod Materials
25. Playground Materials (as applicable)
26. Electrical Materials and Appurtenances
27. Plumbing Materials and Appurtenances
28. Mechanical Materials and Appurtenances
29. Building Materials and Designs
30. Line Striping, Signs and Wheel Stops
31. Any and All Additional Items As Requested By the Owner, the Architect and/or Engineer



## PART 3 - EXECUTION

## 3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for coordination with other work 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 OWNER'S / ENGINEER'S ACTION

- A. General: The Owner and/or Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Informational Submittals: the Owner and/or Engineer will review each informational submittal, take appropriate action and forward each submittal to the appropriate parties.
- C. Material Submittals: the Owner and/or Engineer will review and mark each material submittal with the result of the review. The Contractor shall revise and re-submit if necessary, within the specified time limits. Do not order or incorporate into the work material not marked as "Accepted" or "Supply As Noted".
- D. Installed unapproved material will be subject to removal or non-payment at the Owner's and/or Engineer's sole discretion.
- E. Partial submittals will be considered non-responsive and returned without review.
- F. Submittals not required by the Contract Documents will be discarded.

END OF SECTION 01330

## SECTION 01400 - QUALITY REQUIREMENTS

## 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 quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for the Contractor to provide quality-assurance and -control services required by Engineer, Owner, Construction Manager, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections include the following:
  - 1. Division 1 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
  - 2. All other Divisions and Sections for specific test and inspection requirements.

## 1.3 DEFINITIONS

- A. Quality Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by the Engineer or Construction Manager.
- C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation. Mock-ups are not samples.
- D. Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.
- E. Pre-construction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- F. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
- G. Source Quality Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- H. Field Quality Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- J. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
  - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that specified requirements apply exclusively to tradespeople of the corresponding generic name.
- K. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five (5) previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

#### 1.4 CONFLICTING REQUIREMENTS

- A. General: If compliance with two (2) or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to the Engineer for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to the Engineer for a decision before proceeding.

#### 1.5 SUBMITTALS

- A. Qualification Data: For testing agencies specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
  - 1. Specification Section number and title.
  - 2. Description of tests and inspection.
  - 3. Identification of applicable standards.
  - 4. Identification of test and inspection methods.
  - 5. Number of tests and inspections required.
  - 6. Time schedule or time span for tests and inspections.
  - 7. Entity responsible for performing tests and inspections.
  - 8. Requirements for obtaining samples.
  - 9. Unique characteristics of each quality-control service.
- C. Reports: Prepare and submit certified written reports that include the following:
  - 1. Date of issue.
  - 2. Project title and number.
  - 3. Name, address, and telephone number of testing agency.
  - 4. Dates and locations of samples and tests or inspections.
  - 5. Names of individuals making tests and inspections.
  - 6. Description of the Work and test and inspection method.
  - 7. Identification of product and Specification Section.
  - 8. Complete test or inspection data.
  - 9. Test and inspection results and an interpretation of test results.
  - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  - 12. Name and signature of laboratory inspector.
  - 13. Recommendations on retesting and reinspecting.

- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

## 1.6 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products like those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- E. Professional Engineer Qualifications: A Professional Engineer who is legally qualified to practice in the jurisdiction where the Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are like those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy the qualification requirements indicated and shall be engaged for the activities indicated.
  - 1. Requirement for specialists shall not supersede building codes and regulations governing the Work.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
  - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

- H. Pre-construction Testing: Where testing agency is indicated to perform pre-construction testing for compliance with specified requirements for performance and test methods, comply with the following:
1. Contractor responsibilities include the following:
    - a. Provide test specimens representative of proposed products and construction.
    - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
    - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
    - d. Build site-assembled test assemblies and mockups using installers who will perform the same tasks for Project.
    - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
    - f. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.
  2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Engineer, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

#### 1.7 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as the Owner's responsibility, the Owner will engage a qualified testing agency to perform these services.
1. The Owner will furnish the Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
  3. Costs for re-testing and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

- B. Tests and inspections not explicitly assigned to Owner are the Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
  2. Notify testing agencies at least twenty-four (24) hours in advance of time when Work that requires testing or inspecting will be performed.
  3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section "Submittal Procedures."
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with the Engineer, Construction Manager, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify the Engineer, Construction Manager, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform any duties of the Contractor.

- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  4. Facilities for storage and field curing of test samples.
  5. Delivery of samples to testing agencies.
  6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 15 days of date established for commencement of the Work.
1. Distribution: Distribute schedule to Owner, Engineer, Construction Manager, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

## 1.8 OWNER PROVIDED TESTS AND INSPECTIONS

- A. Tests and Inspections: The Owner will engage a qualified testing agency and/or special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:
1. Geotechnical Inspection of backfill including:
    - a. On-site backfill inspection.
    - b. Compaction density testing of material placed by Contractor.
    - c. Testing of existing on-site material used as backfill.
  2. All other tests listed elsewhere in these Specifications as the **specific** responsibility of the Owner. Tests not listed as the **specific** responsibility of the Owner shall be performed by the Contactor at no additional cost to the Owner.



## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

## 3.1 TEST AND INSPECTION LOG

- A. Prepare a record of tests and inspections. Include the following:
  - 1. Date test or inspection was conducted.
  - 2. Description of the Work tested or inspected.
  - 3. Date test or inspection results were transmitted to Engineer.
  - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Engineer's and Construction Manager's reference during normal working hours.

## 3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  - 1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are the Contractor's responsibility, regardless of the assignment of responsibility for quality control services.

END OF SECTION 01400

## SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

## 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 requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Sections include the following:
  - 1. Division 1 Section "Summary" for limitations on utility interruptions and other work restrictions.
  - 2. Division 1 Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.

## 1.3 DEFINITIONS

- A. Permanent Enclosure: As determined by the Engineer permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

## 1.4 USE CHARGES

- A. General: Cost or use charges, including permitting, for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the Owner's construction forces, the Engineer, testing agencies, Subcontractors and authorities having legal control.
- B. Sewer Service: Pay sewer service use charges for sewer usage by all entities for construction operations.
- C. Water Service: Owner's existing water service will not be available for use.
- D. Electric Power Service: Pay electric power service use charges for electricity used by all entities for construction operations. Pay all permitting and service charges including **all** costs for temporary installations.

## 1.5 SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

## 1.6 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

## 1.7 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before the Owner's acceptance, regardless of previously assigned responsibilities.

# PART 2 - PRODUCTS

## 2.1 MATERIALS

- A. Pavement: Comply with Division 2 Section "Asphalt Paving".
- B. Portable Chain-Link Fencing: Minimum 2-inch, 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide galvanized steel bases for supporting posts.

## 2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

## 2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

## PART 3 - EXECUTION

## 3.1 INSTALLATION - GENERAL

- A. Locate facilities where they will serve the project adequately and result in minimum interference with the performance of the Work. Relocate and modify facilities as required by progress of the Work.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

## 3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
  - 1. Arrange with utility companies, the Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for the use of construction personnel. Comply with authorities having legal control for type, number, location, operation, and maintenance of fixtures and facilities.
- D. Heating: Provide temporary heating required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient conditions required and minimize energy consumption.
- F. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

### 3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide incombustible construction for offices, shops, and sheds located within construction area or within thirty (30') feet of building lines. Comply with NFPA 241.
2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities under conditions acceptable to Owner.

B. Traffic Controls: Comply with the requirements of authorities having legal control.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

C. Parking: Provide temporary parking areas for construction personnel.

D. Dewatering Facilities and Drains: Comply with the requirements of authorities having legal control. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding project or adjoining properties nor endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulation.

E. Project Identification and Temporary Signs: Provide Project Identification and other required signs. Install signs where indicated to inform public and individuals seeking entrance to Project. Unauthorized signs are not permitted.

1. Provide temporary, directional signs for construction personnel and visitors.
2. Maintain and touchup signs so they are always legible.

F. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with the requirements of authorities having legal control. Comply with Division 1 Section "Execution Requirements" for progress cleaning requirements.

G. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and are not temporary facilities.

## 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
  - 1. Comply with work restrictions specified in Division 1 Section "Summary."
- B. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to adjacent properties and walkways, according to requirements of authorities having legal control and approved permits.
  - 1. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- C. Stormwater Control: Comply with authorities having legal control. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- D. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- E. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from entering the site except by entrance gates. Provide sketch of area to be enclosed prior to installation for review and approval.
  - 1. Extent of Fence: As required to enclose **entire** project site or portion determined sufficient to accommodate construction operations and protect the public.
  - 2. Maintain security by limiting the number of keys and restricting distribution to authorized personnel. Provide the Owner with one (1) set of keys.
  - 3. Provide Site Enclosure Fence at no **additional** cost to the Owner.
- F. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
- G. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having legal control for erecting structurally adequate barricades, including warning signs and lighting. Provide barriers adequate to prevent vehicles and pedestrians from entering open areas.
- H. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

### 3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Maintenance: Maintain facilities in good operating condition until removal.
  - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- B. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facilities. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
  - 1. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of all Project identification signs.
  - 2. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
  - 3. At Substantial Completion (or Final Completion if applicable) clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 1 Section "Closeout Procedures."

END OF SECTION 01500

## SECTION 01524 - CONSTRUCTION WASTE MANAGEMENT

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings, Approved Permits, 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 administrative and procedural requirements for the following:
  - 1. Salvaging non-hazardous demolition waste.
  - 2. Recycling non-hazardous demolition waste.
  - 3. Disposing of non-hazardous demolition waste.
- B. Related Sections include the following:
  - 1. Division 1 Section "Selective Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements.
  - 2. Division 2 Section "Site Clearing and Preparation" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

## 1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, cleaning, or repair operations. Construction waste includes packaging. All construction waste shall become the Contractor's property, removed from the site, and disposed of at a fully permitted facility at no additional cost to the Owner. Excess trench material from sanitary sewer; storm sewer; waterline; electrical and data conduit and all other utility installations shall be considered as construction waste. Provide evidence of legal disposal upon Owner's request. Failure to provide evidence of legal disposal will result in delays of payment.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations. All demolition waste shall become the Contractor's property, removed from the site, and disposed of at a fully permitted facility at no additional cost to the Owner. Debris resulting from sewer cleaning operations and asphalt millings shall be considered as demolition waste. Provide evidence of legal disposal upon Owner's request. Failure to provide evidence of legal disposal will result in delays of payment.
- C. Disposal: Removal off-site of construction and/or demolition waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having legal control. Do not sell demolition waste without Owner's written permission.



- D. Recycle: Recovery of construction and/or demolition waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of construction and/or demolition waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of construction and/or waste and subsequent incorporation into the Work.
- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices. Provide landfill and incinerator disposal records upon Owner's request. Failure to provide landfill and incinerator disposal records will result in a delay of payment processing.
- H. Qualification Data: For refrigerant recovery technician.
- I. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerants that were present were recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

#### 1.4 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having legal control.
- C. Waste Management Conference: Conduct conference at project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
  - 1. Review requirements for documenting quantities of each type of waste and its disposition.
  - 2. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
  - 3. Review procedures for periodic waste collection and transportation to disposal facilities.
  - 4. Review waste management requirements for each trade.

## 1.5 WASTE MANAGEMENT PLAN

- A. General: Develop plan including waste identification. Indicate quantities by weight or volume but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of construction and demolition waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be disposed of in a landfill or incinerator. Include points of waste generation, total quantity of each type of waste and handling and transportation procedures.
  - 1. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
  - 2. Handling and Transportation Procedures: Include methods that will be used for handling and transporting waste.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 PLAN IMPLEMENTATION

- A. General: Implement Waste Management Plan as approved by Engineer and Owner. Provide handling, containers, storage, signage, transportation, and other items as required to implement Waste Management Plan during the entire duration of the Contract.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at project site.
  - 1. Distribute Waste Management Plan to all concerned within three (3) days of submittal return.
  - 2. Distribute Waste Management Plan to all on-site entities before they begin on-site work. Review plan procedures and locations established for disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

## 3.2 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, all construction and/or demolition waste materials shall become the Contractor's property; removed from the project site and legally disposed of in a landfill or incinerator acceptable to authorities having jurisdiction at no additional cost to the Owner. Provide evidence of legal disposal upon Owner's request. Failure to provide evidence of legal disposal will result in payment delays.
1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
  2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials on-site.
- C. Burial: Do not bury waste materials on-site.
- D. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION 01524

## SECTION 01600 - PRODUCT REQUIREMENTS

## 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 selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.

## 1.3 DEFINITIONS

- A. Products: Items purchased for incorporation into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, current as of date of the Contract Documents.
  - 2. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by the Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

## 1.4 SUBMITTALS

- A. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include the manufacturer's name and proprietary product names for each product.
1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
  2. Form: Tabulate information for each product under the following column headings:
    - a. Specification Section number and title.
    - b. Generic name used in the Contract Documents.
    - c. Proprietary name, model number, and similar designations.
    - d. Manufacturer's name and address.
    - e. Supplier's name and address.
    - f. Installer's name and address.
    - g. Projected delivery date or time span of delivery period.
    - h. Identification of items that require early submittal approval for scheduled delivery date.
  3. Initial Submittal: Within ten (10) days after the Notice of Award (NOA), submit three (3) copies of the initial product list. Include a written explanation for omissions of data and for variations from Contract requirements.
    - a. At the Contractor's option, initial submittal may be limited to product selections and designations that must be established early in Contract period.
  4. Completed List: Within ten (10) working days after the date of commencement of the Work, submit three (3) copies of the complete product list. Include a written explanation for omissions of data and for variations from Contract requirements.
  5. Engineer's Action: The Engineer will respond in writing to the Contractor within ten (10) working days of receipt of the complete product list. The Engineer's response will include a list of unacceptable product selections and a brief explanation of the reasons for this action. The Engineer's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.

- B. Substitution Requests: Submit three (3) copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Substitution Request Form: Use CSI Form 13.1A.
  2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified material or product cannot be provided.
    - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, which will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
    - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    - e. Samples, where applicable or requested.
    - f. List of similar installations for completed projects with project names and addresses and names and addresses of engineers and owners.
    - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    - h. Research/evaluation reports evidencing compliance with the building code in effect for Project, from a model code organization acceptable to authorities having legal control.
    - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
    - j. Cost information, including a proposal of change, if any, in the Contract Sum.
    - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
    - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
    - m. Form of Acceptance: Change Order.
    - n. Use product specified if the Engineer cannot decide on use of a proposed substitution within time allocated.
- C. Comparable Product Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
- a. Form of Approval: As specified in Division 1 Section "Submittal Procedures."
  - b. Use product specified if the Engineer cannot decide on use of a comparable product request within time allocated.

- D. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section "Submittal Procedures." Show compliance with requirements.

## 1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If the Contractor is given option of selecting between two (2) or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.
1. Each Contractor is responsible for providing products and construction methods compatible with products and construction methods of other Contractors.
  2. If a dispute arises between Contractors over concurrently selectable but incompatible products, Engineer will determine which products shall be used.

## 1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with the manufacturer's written instructions. Note that payment for "stored" material will **not** be considered by the Owner.
- B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at project site and to prevent overcrowding of construction spaces.
  2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
  3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
  4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
- C. Storage:
1. Store products to allow for inspection and measurement of quantity or counting of units.
  2. Store materials in a manner that will not endanger Project structure.
  3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
  4. Store cementitious products and materials on elevated platforms.
  5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
  6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
  7. Protect stored products from damage and liquids from freezing.
  8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

## 1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturers' disclaimers and limitations on product warranties do not relieve the Contractor of obligations under requirements of the Contract Documents.
1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
  2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
  2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
  3. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

## PART 2 - PRODUCTS

### 2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, which are undamaged and, unless otherwise indicated, that are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
  2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
  3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
  4. Where products are accompanied by the term "as selected," Engineer will make selection.
  5. Where products are accompanied by the term "match sample," sample to be matched is Engineer's.
  6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
  7. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in Part 2 "Comparable Products" Article to obtain approval for use of an unnamed product.
  8. For RACP projects, all steel shall meet the requirements of TAB 17 and the PA Steel Procurement Act.



## B. Product Selection Procedures:

1. Product: Where Specifications name a sole product and manufacturer, provide the named product that complies with requirements.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
5. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, which complies with requirements. Comply with the provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
6. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, which complies with requirements. Comply with the provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
7. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.
8. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.

## 2.2 PRODUCT SUBSTITUTIONS

- A. Timing: The Engineer will consider requests for substitution if received within ten (10) working days after the Notice to Proceed. Requests received after that time may be considered or rejected at the discretion of the Engineer.
- B. Conditions: The Engineer will consider the Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, the Engineer will return requests without action, except to record noncompliance with these requirements:
1. Requested substitution offers the Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities the Owner must assume. The Owner's additional responsibilities may include compensation to the Engineer for redesign and evaluation services, increased cost of other construction by the Owner, and similar considerations.
  2. Requested substitution does not require extensive revisions to the Contract Documents.
  3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  4. The substitution request is fully documented and properly submitted.
  5. The requested substitution will not adversely affect Contractor's Construction Schedule.
  6. The requested substitution has received necessary approvals from authorities having legal control.
  7. Requested substitution is compatible with other portions of the Work.
  8. Requested substitution has been coordinated with other portions of the Work.
  9. Requested substitution provides specified warranty.
  10. If the requested substitution involves more than one Contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all Contractors involved.

## 2.3 COMPARABLE PRODUCTS

- A. Conditions: The Engineer will consider the Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, the Engineer will return requests without action, except to record non-compliance with these requirements:
1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
  2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
  3. Evidence that the proposed product provides specified warranty.
  4. List of similar installations for completed projects with project names and addresses and names and addresses of engineers and owners, if requested.
  5. Samples, if requested.

END OF SECTION 01600

## SECTION 01700 - EXECUTION REQUIREMENTS

## 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 general procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Field engineering
  - 2. General installation of products.
  - 3. Progress cleaning.
  - 4. Starting and adjusting.
  - 5. Protection of installed construction.
  - 6. Correction of the Work.
- B. Related Sections include the following:
  - 1. Division 1 Section "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
  - 2. Division 1 Section "Submittal Procedures" for submitting surveys.
  - 3. Division 1 Section "Closeout Procedures" for submitting final as-built survey (if required) with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

## PART 2 - EXECUTION

## 2.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work. Verify the location and points of connection of utility services.
- B. Existing Utilities: The existence and location of the underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work. Perform all necessary subsurface investigation as required and as indicated to fully determine the position of all underground utilities including laterals. Conduct a SUE Quality Type B (QL-B) GPR survey to the quality level indicated in the Contract Documents. Payment for this requirement shall be considered incidental to the Bid or as listed on the Bid Form and Proposal.
  - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical, gas, and data services.
  - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  - 1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
    - a. Description of the Work.
    - b. List of detrimental conditions, including substrates.
    - c. List of unacceptable installation tolerances.
    - d. Recommended corrections.
  - 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
  - 3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  - 4. Examine the walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  - 5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

## 2.2 PREPARATION

- A. Existing Utility Information: Furnish information to the Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having legal control.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to the Engineer. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on CSI Form 13.2A, "Request for Interpretation."

## 2.3 FIELD ENGINEERING

- A. Identification: The Owner will identify or otherwise establish benchmarks, control points, and property corners.
- B. Reference Points: Locate existing or established permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
  - 1. Do not change or relocate existing benchmarks or control points without prior written approval of the Engineer. Report lost or destroyed permanent benchmarks or control points promptly. Report on the need to relocate permanent benchmarks or control points to the Engineer before proceeding.
  - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points. Replacement of lost or destroyed permanent benchmarks and control points shall be at the Contractor's sole cost and expense.

## 2.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize the space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
- B. Comply with the manufacturer's written instructions and recommendations for installing products in the applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading more than that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties' involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
  - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Engineer.
  - 2. Allow for building movement, including thermal expansion and contraction.
  - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, which are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- H. Joints: Make joints of uniform width. Where joint locations in the exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

## 2.5 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
  - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 2. Do not hold materials for more than seven (7) days during normal weather or three (3) days if the temperature is expected to rise above 80° Fahrenheit.
  - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Remove liquid spills promptly.
  - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Burning or burying waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

## 2.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial (or Final) Completion. Replace damaged Work at no additional cost to the Owner regardless of the reason for damage or deterioration.
- B. Comply with manufacturers' written instructions for temperature and relative humidity.

## 2.7 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
  - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.
- F. Provide all necessary corrections at no additional cost to the Owner.

END OF SECTION 01700



## SECTION 01770 - CLOSEOUT PROCEDURES

## 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 contract closeout, including, but not limited to, the following:
  - 1. Substantial and Final Completion.
  - 2. Maintenance Bond and Contract Final Requirements.
  - 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.
  - 2. Division 1 Section "Photographic and Video Documentation" for submitting Final Completion construction photographs and/or video.
  - 3. Divisions 2 Sections for specific closeout and special cleaning requirements for the Work in those Sections.
  - 4. All other Divisions for specific closeout requirements for the work in those Sections.

## 1.3 SUBSTANTIAL COMPLETION (IF APPLICABLE)

- A. Preliminary Procedures: Before requesting inspection to determine the date of Substantial Completion, complete the following:
  - 1. Prepare a list of items to be completed and corrected including a total value for all listed items.
- B. Inspection: Submit a written request for Substantial Completion inspection (if applicable). Upon receipt of request, the Owner will either proceed with an inspection or notify the Contractor of items that need to be completed or corrected prior to conducting the Substantial Completion inspection. The Owner will prepare the Certificate of Substantial Completion after inspection has proven satisfactory or will notify the Contractor of items that must be completed or corrected before the Certificate is issued.
  - 1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

## 1.4 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting a final inspection to determine the date of Final Completion, complete the following:
1. Prepare and submit a draft final Application for Payment according to Division 1 Section "Payment Procedures."
  2. Submit evidence of continuing insurance coverage complying with insurance requirements.
  3. Prepare a list of items to be completed or corrected including a total value for all listed items.
- B. Inspection: Submit a written request for Final Completion inspection. On receipt of request, the Owner will either proceed with an inspection or notify Contractor of items that need to be completed or corrected prior to a final inspection. The Owner will prepare a Final Completion Certificate for after inspection has proven satisfactory or will notify Contractor of items that must be completed or corrected before the Certificate is issued.
1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

## 1.5 MAINTENANCE BOND AND FINAL CONTRACT REQUIRMENTS

- A. The Contractors shall provide a two (2) year Maintenance Bond in the amount of fifty (50%) percent of the final Contract Value of the Contract on a form meeting the Owner's approval upon completion and final **acceptance** of the work by the Owner regardless of the date of physical work completion. Final payment, including retainage, will not be released until the Owner is in receipt of approved Maintenance Bonds.
- B. All required releases, liens, warranties, start-up results, permits, and documentation as outlined elsewhere in the Contract Documents.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

## 3.1 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. Cleaning: As follows:
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire project or for a portion of project:
    - a. Clean project site, yard, and grounds of rubbish, waste material, litter and other foreign substances in areas disturbed by construction activities, including landscaped areas.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Remove tools, construction equipment, machinery, and surplus material from project site.
    - d. Remove debris and surface dust from limited access spaces, including trenches, equipment vaults, manholes, and similar spaces.
  - 2. Complete building cleaning to industry standards using industry accepted means and methods.
- C. Comply with safety standards for cleaning. Do not bury debris, waste or excess materials on Owner's or property owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from project site and dispose of lawfully. Provide evidence of lawful disposal upon request.

## 3.2 START UP AND TRAINING

- A. General: Provide all required start up and training at **no** additional cost to the Owner.

END OF SECTION 01770

## SECTION 02080 - PIPED UTILITIES - BASIC MATERIALS AND METHODS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings, Approved Permits, 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. ABS: Acrylonitrile-butadiene-styrene plastic.
- C. PE: Polyethylene plastic.
- D. 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.

## PART 2 - PRODUCTS

## 2.1 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. ABS Piping: ASTM D 2235.
  - 2. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
  - 3. PVC to ABS Piping Transition: ASTM D 3138.

## 2.2 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 Non-pressure Drainage Piping:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
    - a. Fernco, Inc.
  - 2. Description: ASTM C 1173 with elastomeric sleeve, ends same size as piping to be joined, stainless steel shear ring and two nut and bolt take-up points per band. Couplings **shall** be Fernco Strong Back RC 5000 Series Coupling (or approved equal).

## 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 them 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. Plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on the Coordination Drawings.
- 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.
- G. Refer to equipment specifications in other Sections for roughing-in requirements.

## 3.3 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 2 Sections specifying piping systems.
- B. Ream the 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. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 appendixes.
  3. 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.
  4. PVC Non-pressure Piping: Join according to ASTM D 2855.
  5. PVC to ABS Non-pressure Transition Fittings: Join according to ASTM D 3138 Appendix.
- E. Plastic Non-pressure Piping Gasketed Joints: Join according to ASTM D 3212.
- F. Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.

END OF SECTION 02080

## SECTION 02220 – TRAFFIC CONTROL AND NOTIFICATIONS

## 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 the following:
  - 1. Signs, Traffic Control Devices, Flaggers and Work Coordination.
  - 2. Traffic Control and/or Detour Plan – Township Roads
  - 3. Notifications.
  - 4. PennDOT District 11 Roadwork Notification and Approval (if applicable)
- B. Related Sections include the following:
  - 1. Division 1 Section “General Project Requirements”.

## 1.3 DEFINITIONS

- A. PennDOT.: Pennsylvania Department of Transportation

## PART 2 - PRODUCTS

## 2.1 SIGNS AND OTHER TRAFFIC CONTROL DEVICES

- A. All traffic control signs, and warning devices shall meet the specifications set forth in the most current editions of PennDOT Publication 236.



## PART 3 - EXECUTION

## 3.1 SIGNS, TRAFFIC CONTROL DEVICES, FLAGGERS AND WORK COORDINATION

- A. The Contractor shall install and maintain all required signs and traffic control devices to maintain proper traffic control for the duration of the work. All signs and devices shall be installed in accordance with the most current edition of PennDOT Publication 213.
- B. The Contractor shall furnish, erect, and maintain at closures, intersections and throughout the project all necessary standard or approved barricades; suitable and sufficient red lights; torches; approved reflectors; danger signals; and warning and closure signs. All barricades, danger signals, warning signs and obstructions shall be illuminated at night and remain illuminated from sunset to sunrise.
- C. The Contractor shall furnish certified flaggers in accordance with the most current edition of PennDOT Publication 234. The Contractor shall assure that flaggers carry a valid wallet-sized training card containing the name of the flagger, training source, date of successful completion of training, and signature; or provide a roster of trained flaggers to the Owner before the start of flagging operations that contain the names of flaggers, training source, and date of successful completion of training. Flaggers stationing shall be in strict accordance with the most current applicable PATA drawing in Publication 213 for the work being performed.
- D. The Contractor will be responsible for installing and maintaining pedestrian information, detour signs and traffic control signs as required by the Owner and/or PennDOT.
- E. The Contractor shall be responsible for coordinating his work schedule with affected property owners and businesses as well as practical. The Owner reserves the right to revise the Contractor's schedule and hours of work at no additional cost to the Owner.
- F. The Contractor shall install and remove the traffic control signs at the end of every workday unless the Owner approves a posted detour.
- G. The Contractor shall coordinate his activities with the Police Department to maintain safe traffic flow with minimum inconvenience to the public.
- H. The Contractor shall be required to coordinate the work with property owners; the Police Department; the School District; the Owner; the Engineer; other contracted municipal and emergency services; and all other entities that may be affected by the work to minimize disruption to the listed parties' schedules and services.
- I. The Contractor shall note that at no time will the roadway be allowed to be fully closed to emergency traffic. The Contractor shall have available at all times all measures necessary, such as road plates, to meet this requirement.

- J. All work conducted in the State Right-of-Way (if applicable) shall be conducted using the approved Highway Occupancy Permit (HOP) Plan. The Contractor shall be required to install all necessary traffic control devices and signage, furnish all necessary flagmen, perform all required PennDOT restoration and observe all working hour requirements (including night work) of the Highway Occupancy Permit (HOP) at no additional cost to the Owner. The Contractor shall note that construction within the PennDOT right-of-way shall follow the Owner's Construction Details. The Contractor shall notify the Owner and/or Engineer of conflicts between the Details shown on the PennDOT Plans, the Construction Drawings, and the PennDOT RC Standards before construction for resolution by the Owner, Engineer and/or PennDOT.

### 3.2 TRAFFIC CONTROL AND/OR DETOUR PLAN – MUNICIPAL ROADS

- A. The Contractor shall prepare and submit a traffic control and/or detour plan for Municipal road closures to the Owner and/or Engineer for review and approval prior to beginning work (as applicable). No work will be allowed to begin until the Contractor has obtained an approved Township traffic control and/or detour plan.
- B. The Contractor shall install and maintain all required signs and devices in accordance with the approved Municipal Traffic Control and/or Detour Plan at no additional cost to the Owner.

### 3.3 NOTIFICATIONS

- A. The Contractor shall prepare and submit a Resident and/or Business Notification Form to the Owner and/or Engineer for review and approval prior to beginning work. The Form shall include an approximate start date(s) and a twenty-four (24)-hour emergency Contractor contact telephone number. No work will be allowed to begin until the Contractor has obtained an approved Resident and/or Business Notification Form from the Owner and/or Engineer.
- B. Residents and/or businesses adjacent to the work on both sides of the street shall be notified in writing a minimum of seventy-two (72) hours prior to beginning work. In addition, all residents, and/or businesses within five hundred (500')-feet in any direction of any proposed work shall be notified.
- C. The Contractor shall notify the Engineer and/or Owner and/or all other effected entities **daily** of the proposed work area(s) for projects with multiple sites (CIPP lining contracts; point repair contracts; etc.).
- D. The Contractor shall be assessed a one thousand (\$1,000.00) dollar per resident penalty for failure to comply with the above Paragraphs. Monies assessed under this Paragraph will be deducted from the most current Application for Payment or from available Retainage in the event the most current Application sum is not sufficient.

## 3.4 PENNDOT DISTRICT 11 ROADWORK NOTIFICATION AND APPROVAL (RNA)

- A. The Contractor shall complete and submit the PennDOT District 11 Roadway Notification and Approval (RNA) (if applicable) to the Engineer a minimum of thirty (30) days prior to beginning work.
- B. No additional monetary compensation or time allowances will be considered as a result of the Contractor's failure to comply with the above requirement.
- C. The Contractor will be required to notify PennDOT as required per the approved Highway Occupancy Permit (HOP) (if applicable).

END OF SECTION 02220

## SECTION 02225 - TEMPORARY TREE AND PLANT PROTECTION

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings, Approved Permits, 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 protection and trimming of existing trees that interfere with, or are affected by, execution of the Work, whether temporary or permanent construction.
- B. Related Sections include the following:
  - 1. Division 2 Section "Site Clearing and Preparation" for removal limits of trees, shrubs, and other plantings affected by new construction.
  - 2. Division 2 Section "Earthwork" for excavation, backfilling, compacting and grading requirements, and soil materials.

## 1.3 DEFINITIONS

- A. Tree Protection Zone: Area surrounding individual trees or groups of trees to remain during construction and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

## 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Tree Pruning Schedule: Written schedule from Arborist detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.
- C. Qualification Data: For tree service firms and Arborist.
- D. Certification: From Arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.
- E. Maintenance Recommendations: From Arborist, for care and protection of trees affected by construction during and after completing the Work.

## 1.5 QUALITY ASSURANCE

- A. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed tree protection and trimming work like that required for this project and that will assign an experienced, qualified Arborist to project site during execution of tree protection and trimming.
- B. Arborist Qualifications: An Arborist certified by ISA or licensed in the area where project is located.
- C. Tree Pruning Standard: Comply with ANSI A300 (Part 1), "Tree, Shrub, and Other Woody Plant Maintenance--Standard Practices (Pruning)."
- D. Pre-installation Conference: Conduct conference at project site.
  - 1. Before tree protection and trimming operations begin, meet with representatives of authorities having legal control, Owner, Arborist, consultants, and other concerned entities to review tree protection and trimming procedures and responsibilities.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Drainage Fill: Selected crushed stone, ASTM D 448, Size 24, with ninety (90) to one hundred (100%) percent passing a two and one-half (2 1/2")-inch sieve and not more than ten (10%) percent passing a three quarter (3/4")-inch sieve.
- B. Topsoil: Topsoil furnished by the Contractor shall consist of a natural friable surface soil without admixtures of undesirable subsoil, refuse, or foreign materials. It shall be shredded and free from roots, hard clay, rocks larger than one (1")-inch in any dimension, noxious weeds, tall grass, brush, sticks, stubble, or other litter, and shall be free-draining and non-toxic. Topsoil shall not contain more than ten (10%) percent gravel by dry weight of total sample. For the purposes of this Paragraph, gravel is defined per ASTM D422 modified to include only material passing one (1")-inch and retained on the No. 4 sieve.

Topsoil shall conform to the following requirements, as tested using the procedures included in ASTM D422, ASTM D2974 and AASHTO T267. The topsoil shall be tested by the Contractor and inspected by the Engineer before approval will be granted for its use.

| Category         | Topsoil Mix                          | Athletic / Sports Field                       | Sports Field / Infield Loam |
|------------------|--------------------------------------|-----------------------------------------------|-----------------------------|
| Organic Material | 15-25% by dry weight of total sample | Not less than 15% nor more than 25% by volume | 0.0%                        |
| Silt             | 25% to 45% by dry weight             | Not less than 20% nor more than 35% by volume | 80% by volume               |
| Sand             | 35% to 55% by dry weight             | Not less than 50% nor more than 55% by volume | 20% by volume               |

Required field depth: six (6")-inches after settling or as otherwise listed.

Organic material is to be determined by loss-on-ignition of oven-dried material in accordance with ASTM D2974.

- C. Filter Fabric: Manufacturer's standard, nonwoven, pervious, geotextile fabric of polypropylene, nylon, or polyester fibers.
- D. Chain-Link Fence: Metallic-coated steel chain-link fence fabric of 0.120-inch- diameter wire; a minimum of 48 inches high; with 1.9 inch- diameter line posts; 2-3/8-inch- diameter terminal and corner posts; 1-5/8-inch- diameter top rail; an 0.177-inch- diameter bottom tension wire; with tie wires, hog ring ties, and other accessories for a complete fence system.
- E. Organic Mulch: Shredded hardwood free of deleterious materials.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Temporary Fencing: Install temporary fencing around tree protection zones to protect remaining trees and vegetation from construction damage. Maintain temporary fence and remove when construction is complete.
  - 1. Install chain-link fence according to ASTM F 567 and manufacturer's written instructions.
- B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

- C. Mulch areas inside tree protection zones and within drip line of trees to remain and other areas indicated.
  - 1. Apply three (3")-inch average thickness of organic mulch. Do not place mulch within six (6")-inches of tree trunks.
- D. Do not store construction materials, debris, or excavated material inside tree protection zones. Do not permit vehicles or foot traffic within tree protection zones; prevent soil compaction over root systems.
- E. Maintain tree protection zones free of weeds and trash.
- F. Do not allow fires within tree protection zones.

### 3.2 EXCAVATION

- A. Install shoring or other protective support systems to minimize sloping or benching of excavations.
- B. Do not excavate within tree protection zones, unless otherwise indicated.
- C. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks and comb soil to expose roots.
  - 1. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately three (3")-inches back from new construction.
  - 2. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.
- D. Where utility trenches are required within tree protection zones, tunnel under or around roots by drilling, auger boring, pipe jacking, or digging by hand at no additional cost to the Owner.
  - 1. Root Pruning: Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots with sharp pruning instruments; do not break or chop.

### 3.3 REGRADING

- A. Grade Lowering: Where a new grade is indicated below existing grades around trees, slope grade away from trees as recommended by arborist, unless otherwise indicated.
  - 1. Root Pruning: Prune tree roots exposed during grade lowering. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots with sharp pruning instruments; do not break or chop.
- B. Minor Fill: Where existing grade is six (6'')-inches or less below elevation of finish grade, fill with topsoil. Place topsoil in a single uncompacted layer and hand grade to required finish elevations.
- C. Moderate Fill: Where existing grade is more than six (6'')-inches but less than twelve (12'')-inches below elevation of finish grade, place drainage fill, filter fabric, and topsoil on existing grade as follows:
  - 1. Carefully place drainage fill against tree trunk approximately two (2'')-inches above elevation of finish grade and extend not less than eighteen (18'')-inches from tree trunk on all sides. For balance of area within drip-line perimeter, place drainage fill up to six (6'')-inches below elevation of grade.
  - 2. Place filter fabric with edges overlapping six (6'')-inches minimum.
  - 3. Place fill layer of topsoil to finish grade. Do not compact drainage fill or topsoil. Hand grade to required finish elevations.

### 3.4 TREE PRUNING

- A. Prune trees to remain to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by Arborist.
- B. Pruning Standards: Prune trees according to ANSI A300 Part 1.
- C. Cut branches with sharp pruning instruments. Do not break or chop.
- D. Chip removed tree branches and dispose of off-site.



## 3.5 TREE REPAIR AND REPLACEMENT

- A. Promptly repair trees damaged by construction operations within twenty-four (24) hours. Treat damaged trunks, limbs, and roots according to arborist's written instructions.
- B. Remove and replace trees indicated to remain that die or are damaged during construction operations that arborist determines are incapable of restoring to normal growth pattern.
  - 1. Provide new trees of six (6")-inch caliper size and of a species selected by Owner when damaged trees more than six (6")-inches in caliper size, measured twelve (12")-inches above grade, are required to be replaced.
- C. Aerate surface soil, compacted during construction, ten (10')-feet beyond drip line and no closer than thirty-six (36")-inches to tree trunk. Drill two (2")-inch diameter holes a minimum of twelve (12")-inches deep at twenty-four (24")-inches on center. Backfill holes with an equal mix of augered soil and sand.

## 3.6 DISPOSAL OF WASTE MATERIALS

- A. On-site burning or burial is not permitted.
- B. Disposal: Remove excess excavated material and displaced trees from Owner's and property owner's property at a fully permitted facility.

END OF SECTION 02225

## SECTION 02230 - SITE CLEARING AND PREPARATION

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings, Approved Permits, 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. Removing above- and below-grade site improvements.
  - 2. Erosion and sedimentation control measures.
- B. Related Sections include the following:
  - 1. Division 2 Section "Earthwork" for soil materials, excavating, backfilling, and site grading.

## 1.3 DEFINITIONS

- A. Topsoil: Topsoil furnished by the Contractor shall consist of a natural friable surface soil without admixtures of undesirable subsoil, refuse, or foreign materials. It shall be shredded and free from roots, hard clay, rocks larger than one (1")-inch in any dimension, noxious weeds, tall grass, brush, sticks, stubble, or other litter, and shall be free-draining and non-toxic. Topsoil shall not contain more than ten (10%) percent gravel by dry weight of total sample. For the purposes of this Paragraph, gravel is defined per ASTM D422 modified to include only material passing one (1")-inch and retained on the No. 4 sieve.

Topsoil shall conform to the following requirements, as tested using the procedures included in ASTM D422, ASTM D2974 and AASHTO T267. The topsoil shall be tested by the Contractor and inspected by the Engineer before approval will be granted for its use.

| Category         | Topsoil Mix                          | Athletic / Sports Field                       | Sports Field / Infield Loam |
|------------------|--------------------------------------|-----------------------------------------------|-----------------------------|
| Organic Material | 15-25% by dry weight of total sample | Not less than 15% nor more than 25% by volume | 0.0%                        |
| Silt             | 25% to 45% by dry weight             | Not less than 20% nor more than 35% by volume | 80% by volume               |
| Sand             | 35% to 55% by dry weight             | Not less than 50% nor more than 55% by volume | 20% by volume               |

Required field depth: six (6")-inches after settling or as otherwise listed.

Organic material is to be determined by loss-on-ignition of oven-dried material in accordance with ASTM D2974.

- B. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.
- C. Contractor: Shall be the Contractor for Base Bid – General Construction unless specifically designated elsewhere in the Contract Documents.

#### 1.4 MATERIAL OWNERSHIP

- A. Except for stripped topsoil needed for restoration or other materials specifically indicated to remain Owner's property and hauled to the designated "Stockpile Site" (or as directed by Owner), cleared, removed, or demolished materials shall become the Contractor's property and be removed from the project site at no additional cost to the Owner. On-site burial of any material will not be permitted.

#### 1.5 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-preparation operations.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from the Owner and authorities having legal control.
- B. Improvements on Adjoining Property: Authority for performing site preparation indicated on property adjoining Owner's property will be obtained, in writing by the Owner.
  - 1. Do not proceed with work on adjoining property until directed by the Owner or Owner's Representative.

- C. Keep dirt, dust, mud, noise, and other objectionable nuisances to a minimum. Use temporary enclosures, calcium chloride, coverings and sprinkling, or combinations thereof, as necessary to limit dust to lowest practicable level, except do not use water to the extent that it causes flooding, contaminated runoff, or icing. All dust and mud control measures shall be provided by the Contractor and considered incidental to the Bid. Provide power-brooming equipment and water to remove mud and/or dust from roadways at no additional charge to the Owner.
- D. Salvable Improvements: Carefully remove items indicated to be salvaged and store them on Owner's premises where indicated.
- E. Do not commence site preparation operations until temporary erosion and sedimentation control measures are in place.

## PART 2 - PRODUCTS

### 2.1 GEOTEXTILES FOR EROSION AND SEDIMENTATION CONTROL

- A. Silt Fence Material: Non-biodegradable, sunlight stabilized, woven polypropylene fabric, type which will retain sediment and reduce water runoff velocity meeting the specifications for Class 3 geotextile, Type A or B as set forth in Section 735 in the current edition of PennDOT Publication 408.
- B. Slope Stabilization Geotextile: Non-biodegradable, sunlight stabilized, woven polypropylene fabric, type which will retain sediment and reduce water runoff velocity meeting the specifications set forth in Section 806 in the current edition of PennDOT Publication 408. All slope stabilization geotextile shall be NAG SC150 (or approved equal).
- C. Compost Filter Sock: Shall meet all requirements for compost filter sock as listed in the Pennsylvania Department of Environmental Protection (PA DEP) Erosion and Sediment Pollution Control Program Manual (March 2012).
- D. Inlet Filter Bag: Shall meet all requirements for inlet filter bags as listed in the Pennsylvania Department of Environmental Protection (PA DEP) Erosion and Sediment Pollution Control Program Manual (March 2012).

## PART 3 - EXECUTION

### 3.1 GENERAL REQUIREMENTS

- A. Structures, piping, manholes, inlets, obstructions, utilities, walls, fences, trees, and shrubs shown on the Construction Drawings are those known to exist, but their location is not guaranteed to be exact, nor is it guaranteed that all structures, piping, manholes, inlets, obstructions, utilities, walls, fences, trees, and shrubs are shown. The Contractor shall, however, be responsible for the protection of all structures, piping, manholes, inlets, obstructions, utilities, walls, fences, trees, and shrubs, whether shown on the Construction Drawings or not.

- B. The Contractor shall, at his own expense, repair or replace all ground surfaces, pavements, sidewalks, curbs, etc., which are to remain, and which become disturbed or damaged due to his operations. Said repair or replacement shall be made at the Contractor's sole expense, be satisfactory to the Engineer and in accordance with the requirements of all governing bodies having jurisdiction.
- C. The Contractor shall maintain all roads and driveways adjacent to the site as well as those used during the prosecution of the Work in a manner satisfactory to the Agency or Owner having jurisdiction over those roads and driveways. This shall include, but not be limited to, manual sweeping, power sweeping and/or high pressure washing to prevent excessive tracking of dust and mud onto other public highways and streets. Payment for compliance with this Paragraph shall be considered incidental to the Bid. In addition, all Highway Occupancy Permit (HOP) Conditions (if applicable) regarding road maintenance shall be strictly followed at no additional cost to the Owner.
- D. The Contractor shall prevent movement and settlement of adjacent structures by installing temporary barriers, fences, guard rails, enclosures, shoring, bracing, planking, barricades, lights, warning signs and other protections required to protect structures, utilities, landscaping, and other items that are to remain in place. Payment for compliance with this Paragraph, including costs for delegated design, shall be considered incidental to the Bid.
- E. The Contractor shall be required to clear and grub the site including the disposal of material that is cleared and/or grubbed within the limits of disturbance (LOD) or construction easements as shown on the Plans. Clearing shall include, but not be limited to, the removal and disposal of all trees (regardless of size), brush, stumps, grass, weeds, decayed vegetative matter, loose boulders of two (2) cubic yards or less, downed trees, or other material resting or protruding through the ground surface. Grubbing shall include but not be limited to the removal and disposal of all objectionable material defined above under clearing, which is embedded in the underlying soil. The removal of trees, shrubs, and other vegetation shall include their complete root system to a depth of at least eighteen (18")-inches below the existing surface. No burning or on-site burial of the resulting trash, timber, stumps, and other vegetation shall be allowed on site. The Contractor shall be responsible for the off-site disposal of all material removed and/or demolished under this item. The Contractor shall review the limits of disturbance, construction easements and clearing with the Owner and/or Engineer's Representative prior to the start of clearing and grubbing. Once the limits of clearing within the limits of disturbance and/or construction easements have been approved by the Owner and/or the Engineer's Representative, the Contractor shall not damage trees, other vegetation, structures, access roads, etc. beyond the established limits. All damage shall be repaired to the Owner and/or Engineer's Representative's complete satisfaction at the Contractor's sole expense. Temporary chip pile locations may be approved by the Owner and/or Engineer's Representative. Payment for this item shall include review of limits of clearing, off-site removal of all trees, stumps, logs, shrubs, temporary chip piles and other vegetation, and all other items required to be removed. All items shall be disposed of at a fully permitted off-site facility.

### 3.2 PREPARATION

- A. Protect existing site improvements to remain from damage during construction.
  - 1. Restore damaged improvements to their original condition, as acceptable to Owner and/or property owner.
- B. The Contractor shall remove and dispose (or store for replacement) those existing structures, utilities and obstructions which interfere with the proposed construction as shown on the Plans, and as determined in the field by the Engineer or his Representative. This shall include, but not necessarily be limited to, fences, guard rails, walls, poles, pole bases, vaults, tanks, sheds, conduit, and appurtenances, floor slabs, pavements, sidewalks, curbs, traffic poles, signs and sign-supporting structures. The Contractor will be held responsible for any claim arising from his removal of any existing item or structure without the required authorization specified herein.
- C. In removing portions of pavements, curbs, sidewalks, driveways, and related items where other portions of such items are to remain, removal shall be to an existing joint or to a vertical face cut with a power-driven concrete saw or by other approved mechanical line cutting methods.

### 3.3 EROSION AND SEDIMENTATION CONTROL

- A. All erosion and sedimentation controls shall be installed as per the approved Plans. Approved Plans must always remain on-site. Payment for the installation and maintenance of all erosion and sedimentation control measures shall be per the applicable Unit Price item(s) or Lump Sum (LS) item.
- B. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways in accordance with PA Code 25, Chapter 102 and the attached Plans and Permits.
- C. The Contractor shall maintain the work area and access road-ways free of mud and take all necessary measures to prevent the accumulation and tracking of mud. The wheels of vehicles shall be cleaned so that no mud is carried onto walks, drives, streets, or roads.
- D. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established. Payment for maintenance shall be considered incidental to the Bid.
- E. Remove temporary erosion and sedimentation controls after construction has been completed and accepted by the Owner. Restore and stabilize areas disturbed during removal. Payment for control removal shall be considered incidental to the Bid.
- F. Plan and execute construction by methods to control surface drainage from cut, fill, borrow and grading areas.
  - 1. Minimize the amount of bare soil exposed at one time.
  - 2. Schedule operations so the ground surface will be disturbed for the shortest possible time before permanent construction is installed.
  - 3. Maintain large areas as flat as practicable to minimize soil transport through surface flow.

- G. Repair washed and eroded areas; reestablish grades to required density, elevations, profiles, and contours.
- H. Temporary erosion control measures shall be used to correct conditions which develop during construction that are needed prior to installation of permanent control features, or that are temporarily needed to control erosion that develops during normal construction practices, but which are not associated with permanent control features on the Project. All slopes and stockpile areas which will remain undisturbed and seeded for a period of thirty (30) days shall be temporarily seeded with annual rye grass.
- I. Pollutants such as fuels, lubricants, bitumens, raw sewage and other harmful materials shall not be discharged into or near rivers, streams, and impoundments or into natural or manmade channels leading thereto. Wash water or waste from concrete mixing operations shall not be allowed to enter live streams.
- J. The Contractor shall be required to become a Co-Permittee for Chapter 102 Permits (as applicable) and assume all responsibilities as outlined at no additional cost to the Owner.

### 3.4 UTILITIES

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by the 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 the Facility Owner, property owners, and the Owner not less than three (3) days in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without the Facility Owner's and Municipality's written permission.
- B. Excavate for and remove underground utilities indicated to be removed.
- C. All existing gas and water lines, telephone and electric poles, wires, conduits, storm and sanitary sewers, drains, culverts, fire hydrants and other utilities which are to remain shall be carefully supported according to Facility Owner requirements, maintained in operation, and protected from injury or damage by the Contractor. Compliance with this Paragraph shall be considered incidental to the Bid.
- D. All existing gas and water lines, telephone and electric poles, wires, conduits, storm and sanitary sewers, drains, culverts, fire hydrants and other utilities intercepted, disconnected, or otherwise damaged shall be restored and/or rebuilt to the complete satisfaction of the Owner, the Owner's Representative and/or the Facility Owner at no additional cost to the Owner.

### 3.5 SITE IMPROVEMENTS

- A. Remove existing above and below grade improvements as indicated and as necessary to facilitate new construction.
- B. Remove existing site features including fencing, posts, fabric, and footings; trees, shrubs, and bushes; piping; structures; pavements; and all other elements in areas indicated on the Plans.

## 3.6 DISPOSAL

- A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.
  - 1. Separate recyclable materials produced during site preparation from other non-recyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.
- B. All waste material obtained from the removal of structures and obstructions, including, but not limited to, concrete matted together by reinforcing, plaster, wood, paper, asphalt shingles, tanks, metal, broken pavements, brick and concrete block and miscellaneous debris, shall be disposed of legally offsite in a fully permitted facility. Evidence of legal disposal shall be provided to the Owner upon request. Failure to provide the requested evidence of legal disposal will result in payment delays.
- C. Remove and promptly dispose of contaminated, vermin infested, or dangerous materials encountered.
- D. Do not burn or bury materials on site.
- E. Remove tools, equipment, and protections when work is complete and when authorized to do so by local authorities having legal control, Owner, and Engineer's Representative.

END OF SECTION 02230



## SECTION 02235 – SELECTIVE DEMOLITION

## 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 the following:
  - 1. Demolition and removal of selected site elements.
  - 2. Salvage of existing items to be reused or recycled.
- B. Related Sections include the following:
  - 1. Division 2 Section "Site Clearing and Preparation" for site clearing and removal of above- and below-grade improvements.

## 1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed, and salvaged, or removed and reinstalled.

#### 1.4 MATERIALS OWNERSHIP

- A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered during selective demolition remain Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Owner.
  - 1. Coordinate with the Owner's Representative, who will establish special procedures for removal and salvage.
- B. All other demolished items shall become the Contractor's property, removed from the site, and disposed of in a fully permitted facility at no additional cost to the Owner.

#### 1.5 SUBMITTALS

- A. Qualification Data: Supply a list of previous demolition projects similar in nature with references completed in the previous five (5) years.
- B. Schedule of Selective Demolition Activities: Provide the following:
  - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
  - 2. Length of utility service interruptions.
  - 3. Coordination for shutoff, capping, and continuation of utility services.
  - 4. Means for dust- and noise-control measures.
- C. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.
- D. Pre-demolition Documentation: Show existing conditions of adjoining construction and site improvements which might be misconstrued as damage caused by selective demolition operations.
- E. Landfill Records: Indicate receipt and acceptance of waste and hazardous wastes (if any) by a landfill facility licensed to accept wastes and hazardous wastes (if any). Provide records upon Owner's request. Failure to provide records will result in a delay of payment processing.

## 1.6 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that specializes in demolition work similar in material and to the extent indicated for this project.
- B. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.
- C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Standards: Comply with ANSI A10.6 and NFPA 241.
- E. Pre-demolition Conference: Conduct conference at project site. Review methods and procedures related to selective demolition including, but not limited to, the following:
  - 1. Inspect and discuss the condition of construction to be selectively demolished.
  - 2. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
  - 3. Review requirements of work performed by other Contractors that rely on the completion of selective demolition operations.
  - 4. Review areas where existing construction is to remain with protection.

## 1.7 PROJECT CONDITIONS

- A. Conditions existing at time of inspection for Bidding will be maintained by the Owner as far as practical.
  - 1. The Owner will remove any items it wishes to save before selective demolition begins.
- B. Notify Engineer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Hazardous Materials (as applicable):
  - 1. Refer to Owner's Hazardous Materials Report (if any). Gateway assumes no liability for the information contained in the above-mentioned Report.
  - 2. Do not disturb any other suspected hazardous materials that are not referenced in the above Report or listed on Contract Drawings. Immediately notify the Engineer and Owner for direction for removal.
  - 3. Follow Contract Drawing notes for disposition of hazardous materials as applicable.
- D. Storage or sale of removed items or materials on-site is not permitted.

- E. Utility Service: Maintain existing utilities indicated to remain in service. Protect existing utilities against damage during selective demolition operations.

## PART 2 - PRODUCTS – NOT USED

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. Survey of Existing Conditions: Record existing conditions by use of Pre-construction photographs or videography.
- E. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

### 3.2 UTILITY SERVICES

- A. Service Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services serving areas to be selectively demolished.
  - 1. Owner will arrange to shut off indicated services when requested by Contractor.
  - 2. Provide temporary services that bypass area of selective demolition.

### 3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent facilities to remain.
  - 1. Provide protection to ensure safe passage of people around selective demolition areas.
  - 2. Provide temporary weather protection during interval between selective demolition of existing construction and start of new construction.

### 3.4 SELECTIVE DEMOLITION - GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations.
- B. Existing Items to Remain: Protect construction indicated to remain against damage during selective demolition. When permitted by Engineer, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

### 3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.

### 3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from project site and legally dispose of them in a Pennsylvania Department of Environmental (DEP)-approved landfill.
  - 1. Do not allow demolished materials to accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning and Burial: Burning and/or on-site burial of demolished materials will not be permitted.

### 3.7 CLEANING

- A. Clean adjacent improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 02235

## SECTION 02300 - EARTHWORK

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings, Approved Permits, 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, but is not limited to, the following:
  - 1. Preparing subgrades for pavements, lawns, grasses, and landscaping.
  - 2. Excavating trenches for sewers and utilities.
  - 3. Excavating for walls, structures, and site improvements.
  - 4. Bulk excavation and backfill.
- B. Related Sections include the following:
  - 1. Division 2 Section "Temporary Tree and Plant Protection" for protecting and trimming trees to remain.
  - 2. Division 2 Section "Site Clearing and Preparation" for temporary erosion and sedimentation control measures, site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
  - 3. Division 2 Section "Dewatering" for lowering and disposing of ground water during construction.
  - 4. Division 2 Section "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.
  - 5. Division 2 Section "Site Restoration" for finish grading, including preparing and placing topsoil and planting soil for lawns.
  - 6. Division 2 Section "Trench Excavation and Backfill for Sewers and Utilities" for additional and supplemental information regarding excavation and backfill of trenches for sewers and utilities.

## 1.3 DEFINITIONS

- A. Backfill: Soil material or approved aggregate material used to fill a bulk excavation or trench excavation.
  - 1. Initial Backfill ("Pipe Zone"): Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe. This area shall be defined from the invert of pipe to one (1')-foot above the crown of the pipe for the full width (12"-mimum either side of the pipe) and length of the trench.
  - 2. Final Backfill: Approved soil or aggregate material used to fill a trench to final limits.
- B. Base Course: Course placed between the subbase and sidewalks, concrete pavement and hot mix asphalt paving.
- C. Bedding Course: Six (6")-inches (minimum) of approved AASHTO No. 57 limestone placed over the excavated subgrade in a trench for the full width and length of the trench before placing pipe.
- D. Borrow Soil: Satisfactory soil, free of organic or other deleterious material imported from off-site for use as backfill.
- E. Bulk Excavation: Completion of all excavation ("cuts") and structural fills to the lines and grades as shown on the approved Plans.
  - 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Owner. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
  - 2. Open Excavation: Excavation more than ten feet (10') in width and pits more than thirty feet (30') in either length or width. Tank excavations shall be considered open excavations as well as subject to all requirements for full depth aggregate backfill.
  - 3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Owner. Unauthorized excavation, as well as remedial work directed by Owner, shall be without additional compensation.
  - 4. 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.
- F. Fill: Soil materials used to raise existing grades.
- G. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement.
- H. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- I. Sewers and Utilities: On-site underground pipes, conduits, ducts, and cables within the project limits.

- J. Topsoil: Topsoil furnished by the Contractor shall consist of a natural friable surface soil without admixtures of undesirable subsoil, refuse, or foreign materials. It shall be shredded and free from roots, hard clay, rocks larger than one (1")-inch in any dimension, noxious weeds, tall grass, brush, sticks, stubble, or other litter, and shall be free-draining and non-toxic. Topsoil shall not contain more than ten (10%) percent gravel by dry weight of total sample. For the purposes of this Paragraph, gravel is defined per ASTM D422 modified to include only material passing one (1")-inch and retained on the No. 4 sieve.

Topsoil shall conform to the following requirements, as tested using the procedures included in ASTM D422, ASTM D2974 and AASHTO T267. The topsoil shall be tested by the Contractor and inspected by the Engineer before approval will be granted for its use.

| Category         | Topsoil Mix                          | Athletic / Sports Field                       | Sports Field / Infield Loam |
|------------------|--------------------------------------|-----------------------------------------------|-----------------------------|
| Organic Material | 15-25% by dry weight of total sample | Not less than 15% nor more than 25% by volume | 0.0%                        |
| Silt             | 25% to 45% by dry weight             | Not less than 20% nor more than 35% by volume | 80% by volume               |
| Sand             | 35% to 55% by dry weight             | Not less than 50% nor more than 55% by volume | 20% by volume               |

Required field depth: six (6")-inches after settling or as otherwise listed.

Organic material is to be determined by loss-on-ignition of oven-dried material in accordance with ASTM D2974.

- K. PennDOT: Pennsylvania Department of Transportation.
- L. AASHTO: American Association of State Highway and Transportation Officials.
- M. ASTM: American Society for Testing and Materials.
- N. OSHA: Occupational Safety and Health Administration.



## 1.4 SUBMITTALS

- A. Product Data: For the following:
  - 1. Geotextile.
- B. Samples: Twelve (12")-inch by twelve (12")-inch sample of subdrainage and/or separation geotextile.
- C. Pre-excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earthwork operations. Submit before earthwork begins.

## 1.5 QUALITY ASSURANCE

- A. Pre-excavation Conference: Conduct conference at project site.

## 1.6 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Owner and then only after arranging to provide temporary utility services according to requirements indicated.
  - 1. Notify Facility Owner, property owners, and the Owner not less than three (3) days in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without Facility Owner's and the Owner's written permission.
  - 3. Contact utility-locator service for area where project is located before excavating.
  - 4. Conduct GPR survey before excavating. Provide results to the Engineer and the Owner.
- 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.
- C. Project Site Information (If Applicable): A Geotechnical Engineering Investigation Report and/or Boring Logs have been prepared for this Project and is intended for Engineer design purposes only and is made available to Bidders only that they may have access to identical subsurface information available to the Owner. It is presented in good faith and is not intended as a substitute for the personal investigations, interpretations, or judgements of the Contractor. The Owner and/or Engineer expressly deny all responsibility for interpretations drawn from or judgements made on this data.
  - 1. The Contractor shall be allowed to make additional test borings and conduct reasonable exploratory operations necessary for bulk excavation and utility installations upon written request to the Owner within time frames referenced elsewhere in these Specifications.
- D. The Geotechnical Engineering Investigation Report and/or Boring Logs are referenced elsewhere in these Specifications (if applicable).

## PART 2 - PRODUCTS

## 2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, GC, SW, SP, and SM, SC, ML and CL free of rock or gravel larger than eight (8")-inches in any dimension when using as bulk fill and three (3")-inches in any dimension when being placed in utility trenches and within three (3')-feet of final subgrade level, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil Classification Groups OL, CH, MH, OH, and PT according to ASTM D 2487.
  - 1. Unsatisfactory soils also include: a) satisfactory soils not maintained within three (3%) percent of optimum moisture content at time of compaction or b) expansive or carbonaceous materials. Carbonaceous material shall be mixed with limestone at a one (1) to one (1) ratio. It shall not be placed within five (5') feet, both vertically and horizontally, of structures (including foundations), pavements, field surfaces, courts, and fill embankment faces. Therefore, segregation and temporary stockpiling of both materials will be required during bulk grading operations performed at no additional cost to the Owner.
- D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least ninety (90%) percent passing a 1-1/2-inch sieve and not more than twelve (12%) percent passing a No. 200 sieve.
- E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least ninety-five (95%) percent passing a 1-1/2-inch sieve and not more than eight (8%) percent passing a No. 200 sieve.
- F. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with one hundred (100%) percent passing a 1-inch sieve and not more than eight (8%) percent passing a No. 200 sieve.
- G. Drainage Course: Narrowly graded mixture of washed crushed stone or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading AASHTO No. 57; with one hundred (100%) percent passing a 1-1/2-inch sieve and zero (0%) to five (5%) percent passing a No. 8 sieve.
- H. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading AASHTO No. 67; with one hundred (100%) percent passing a one (1")-inch sieve and zero (0%) to five (5%) percent passing a No. 4 sieve.
- I. Sand: ASTM C 33; fine aggregate, natural, or manufactured sand.
- J. Impervious Fill: Clay or silty clay mixture capable of compacting to a dense state.

## 2.2 ENGINEERING FABRICS (GEOTEXTILES)

- A. General: Provide from a manufacturer listed in Bulletin 15 (Pennsylvania).
- B. Fabric: Use fabric consisting of long chain polymeric filaments or yarns such as polyethylene, polyamide, polyvinylene-chloride, polypropylene, or polyester formed into a stable network so that the filaments or yarns retain their relative position to each other. For Class 1, Class 2, and Class 3 Geotextiles, use woven or non-woven fabric. For Class 4 Separation Geotextiles, use a needle-punch "felt like" non-woven fabric. For Class 4 Stabilization and Reinforcement Geotextiles, use a high strength woven fabric. Use fabric inert to commonly encountered construction chemicals or substances. During periods of shipment and storage, protect the fabric from direct sunlight, ultra-violet rays, temperatures greater than 140 F, mud, dirt, dust and debris. To the extent possible, wrap the fabric in a heavy-duty covering or shield from direct sunlight. Geotextiles will be rejected at the time of installation if any defects, deterioration, or damage was incurred during manufacture, transportation, or storage.
- C. Physical requirements: See Table A for indicated construction class and type.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, walls, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by excavation operations using Contractor-determined methods at no additional cost to the Owner.
- B. Preparation of subgrade for bulk excavation and trenching operations including removal of vegetation, topsoil, pavement and base course, debris, obstructions, and deleterious materials from ground surface is specified in Division 2 Section "Site Clearing and Preparation".
- C. Protect and maintain erosion and sedimentation controls, which are specified in Division 2 Section "Site Clearing and Preparation," during earthwork operations.
- D. Provide protective insulating materials to protect subgrades against freezing temperatures or frost.

## 3.2 DEWATERING AND BYPASS

- A. Prevent surface water and ground water from entering bulk and trench excavations, from ponding on prepared subgrades, and from flooding project site and surrounding area. All Bidders should note that the proposed Work will require management of existing surface and conduit water at all times during the course of the work. Methodology to control said water will be at the Contractor's discretion and cost and be considered incidental to the bid item(s) deemed most appropriate by the Contractor.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
  - 1. 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.
  - 2. Install a dewatering system specified in Division 2 Section "Dewatering," to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

## 3.3 EXCAVATION

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include **rock**, soil materials, concrete, slag, timbers, trees, debris, rubbish, and other obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of any encountered material. The Owner will provide the Contractor with a Geotechnical Engineering Report for informational purposes only. The Contractor shall review the provided information and determine his bid on the information contained therein subject to his own interpretation and/or judgement. Trench excavation shall also be considered as unclassified.
  - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace them with satisfactory soil materials.
  - 2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:
    - a. Six (6")- inches beneath pipe in trenches, and the greater of twenty-four (24")- inches wider than pipe or forty-two (42")- inches wide.
- B. All fill embankments shall be supported with a drained keyway at the embankment toe and drained benches at each ten (10')-foot vertical interval above the keyway. The keyway and benches shall be a minimum of fifteen (15') feet wide extending to competent residual soil or bedrock. The slope on the keyway shall be at least six (6) horizontal to one (1) vertical. Minimum three (3')-feet wide notches shall be excavated into the existing slopes at vertical intervals no greater than three (3') feet. All drained keyways shall be placed as directed by the Owner's Geotechnical Representative.
- C. The Contractor shall excavate all materials as required to the dimensions and grades indicated on the Plans.

- 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. The Contractor shall prepare and submit to the Engineer a Construction Schedule including bulk excavation prior to beginning work. No work may begin until an approved Construction Schedule is returned by the Engineer to the Contractor.
- F. The Contractor shall be responsible for the offsite disposal of all non-competent, excavated, surplus, or excess trenched material at no additional cost to the Owner. Prior to bid placement, the Contractor shall advise the Owner of the quantity of surplus material, if any, he estimates will be disposed of offsite. The Contractor shall provide the Owner with a copy of the approved grading permit, Property Owner liability releases and the approved Erosion and Sedimentation Control Plan for the offsite disposal site. All offsite facilities shall be fully permitted at no additional cost to the Owner.
- G. In the event the Contractor disposes of too much excavated material, he shall replace the material as necessary and required at his sole 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 Owner.
- H. The Contractor shall provide all necessary measures to control dust and mud using water, calcium chloride, or other material approved by the Owner and power brooming equipment at such locations and during such periods as directed or as be required by the Owner.
  - 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 of the water shall be provided for positive control by the operator.
  - 3. The Owner will advise the Contractor of any unsatisfactory procedures used for dust and mud control. If the unsatisfactory procedures are not corrected promptly, the Owner may suspend the performance of any or all construction until the condition has been corrected.
- I. Payment for dust and mud control shall be considered incidental to bulk and trench excavation.
- J. Blasting will not be permitted under any circumstances.
- K. Exposed Carbonaceous Material: All carbonaceous material exposed in trench bottoms and sidewalls as well as in any other excavations underlying movement sensitive structures, pavements, or fields / courts, shall be cleaned and sealed as described in the Geotechnical Engineering Investigation Report (as applicable).

- L. Pennsylvania Act 287 of 1974 as amended by Act 50 of 2017, 73 P.S. 176 et. Seq. contains provisions for each stakeholder regarding the reporting of alleged violations. The report should be submitted to the Pennsylvania Public Utility Commission through the One Call System pursuant to the time frame set forth in Act 50 of 2017.
1. Facility Owner – Submit a report of alleged violation not more than thirty (30) business days after receipt of notice that the facility owner's lines have been damaged by excavation or demolition work or if the facility owner believes a violation of the Act has been committed in association with excavation or demolition work. No report may be required where the cost to repair the damage to the facility owner's lines is less than two thousand five hundred dollars (\$ 2,500.00), unless the same person damaged the facility owner's lines two (2) or more times within a six (6)-month period.
  2. Designer – Submit a report of alleged violation not more than thirty (30) business days from the time the designer becomes aware that a violation of this Act may have been committed in association with excavation or demolition work.
  3. Excavator – Submit a report of an alleged violation not more than thirty (30) business days after striking or damaging a facility owner's line during excavation or demolition or if the excavator believes a violation of this Act has been committed in association with excavation or demolition work. Excavators shall **immediately** notify the Designer and Project Owner after striking or damaging a facility owner's line. Failure to notify the Designer and Project Owner will result in the assumption of payment for all fines that may be assessed to the Designer and/or the Project Owner.
  4. Project Owner – Submit a report of alleged violation not more than thirty (30) business days after striking or damaging a facility owner's line during excavation or demolition work activities, after a project owner's contracted excavator strikes or damages a facility owner's line during excavation or demolition activities or if the project owner believes a violation of this Act has been committed in association with excavation or demolition

### 3.4 FLOOR SLAB, PAVEMENT, AND FIELD / COURT SURFACES SUBGRADE PREPARATION CONSIDERATIONS (AS APPLICABLE)

- A. To prepare for floor slab on-grade and pavement construction or the field / court surfaces, all subgrade areas not overlying engineered fill or bedrock shall be proof-rolled as described in the Geotechnical Engineering Investigation Report (as applicable). Unacceptably soft or loose zones delineated by the proof-rolling shall be undercut to a depth of at least two (2') feet or to competent material, whichever first occurs. Subgrade areas remaining unsuitable shall then be stabilized by "punching" AASHTO No. 1 into the subgrade to create a working surface deemed adequate by the on-site Geotechnical Representative. The AASHTO No. 1 aggregate shall be capped with a minimum six (6")-inch thick layer of inert AASHTO No. 57 aggregate. The remaining vacated volumes and all other areas requiring fill shall then be raised to the final subgrade level with properly compacted, suitable, inert, on- or off-site borrow.
- B. Floor slab, pavement, or field /court surface areas overlying non-carbonaceous bedrock shall be overexcavated one (1')-foot and then backfilled with properly compacted, suitable, inert borrow to provide a cushion above the bedrock.

- C. Floor slab, pavement, or field / court surface areas overlying carbonaceous soil or bedrock shall be over excavated two (2') feet. The exposed subgrade shall be cleaned with brooms and/or air compressors and sealed with at least twelve (12") inches of properly compacted, suitable, inert, low porosity and low permeability clay or silty clay, within forty-eight (48) hours of initial exposure. The silt/clay layer shall be spread ahead of the work in a manner that avoids operating equipment on - and thereby disturbing - the cleaned surface to be sealed. Any disturbed subgrade areas must be re-cleaned and addressed to the satisfaction of the on-site Geotechnical Representative before completing the seal. Any exposed vertical carbonaceous faces shall be cleaned and sealed as described in the Geotechnical Engineering Investigation Report (as applicable). The vacated volume shall then be backfilled to the final subgrade level with properly compacted, inert borrow.

### 3.5 EXCAVATION FOR SEWER AND UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations. Excavation for trenches shall be considered as unclassified excavations and subject to all requirements thereof.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to twelve (12") - inches higher than top of pipe or conduit, unless otherwise indicated.
1. Side Clearance: Twelve (12")-inches each side (minimum) of pipe or conduit.
  2. Bottom Depth: Six (6")-inches below (minimum) of pipe or conduit.
  3. Width: As shown on the Standard Details or as recommended by the pipe manufacturer whichever is greater.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrades to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
1. For pipes and conduit six (6")-inches or larger in nominal diameter, shape bottom of trench to support bottom ninety (90)-degrees of pipe circumference. Fill depressions with tamped sand backfill.
  2. Excavate trenches six (6")-inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course. Immediately notify Owner and/or Owner's Representative of unacceptably soft or loose zones if discovered.
  3. Unacceptably soft or loose zones shall be stabilized by "punching" approved AASHTO No. 1 limestone aggregate into the subgrade to create a "working surface" until the subgrade is deemed adequate by the Owner's Representative. Payment for creating a "working surface" shall be by applicable Contract provisions.
- D. Exposed Carbonaceous Material: All carbonaceous material exposed in trench bottoms and sidewalls underlying movement sensitive structures, pavements, or fields, shall be cleaned and sealed as described in the Geotechnical Engineering Investigation Report (as applicable).
- E. Surplus Excavated Material: Surplus material created by placement of pipe and aggregate bedding and/or aggregate backfill in the trench shall become the Contractor's property and be removed from the site at no additional cost to the Owner.

### 3.6 SUBGRADE INSPECTION

- A. Notify Owner when excavations have reached required subgrade.
- B. If Owner determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade with minimum ten-ton (static weight) vibratory roller compactor to identify soft pockets and areas of excessive yielding. Do not proof-roll wet or saturated subgrades.
  - 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to three (3) miles per hour (mph).
  - 2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Owner and replace with compacted backfill or fill as directed.
  - 3. Unacceptably soft or loose zones delineated by proof-rolling shall be stabilized by “punching” AASHTO No. 1 limestone aggregate into the subgrade to create a “working surface” until the subgrade is deemed adequate by the Owner’s Representative. Payment for creating a “working surface” shall be by applicable Contract provisions.
- D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Owner, without additional compensation.

### 3.7 STORAGE OF SOIL MATERIALS

- A. “On-site” stockpiles: stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust. Do not place material in “on-site” stockpiles without written permission from individual property owners.
  - 1. Stockpile soil materials away from the edge of excavations. Do not store within drip line of remaining trees.
  - 2. Place topsoil and excess materials in proposed stockpiles in horizontal lifts. Some compactive effort should be applied to each lift to help achieve some degree of relative consistency and stability within the stockpiles.
  - 3. Remove “on-site” stockpiles from the project site at the conclusion of the project at no additional cost to the Owner.

### 3.8 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
  - 1. Surveying locations of underground utilities for Record Documents.
  - 2. Testing and inspecting underground utilities.
  - 3. Removing trash and debris.
  - 4. Removing temporary shoring and bracing, and sheeting.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.



### 3.9 SEWER AND UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Place and compact initial backfill of subbase material free of particles larger than one (1")- inch in any dimension, to a height of twelve (12")-inches over the utility pipe or conduit.
  - 1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- D. Backfill voids with subbase material while installing and removing shoring and bracing.
- E. Place and compact final backfill of subbase material to final subgrade elevation.
- F. Follow applicable Details and Specifications for material type, depths, and compaction.

### 3.10 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within three (3%) percent of optimum moisture content.
  - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
  - 2. Remove and replace or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by three (3%) percent and is too wet to compact to specified dry unit weight.

### 3.11 COMPACTION OF COHESIVE FILL MATERIAL

- A. All cohesive fill materials placed as general fill to backfill trenches shall be placed in horizontal layers. All cohesive fill materials shall be placed in maximum twelve (12")-inch thick loose lifts and compacted with a sheepfoot, segmented wheel roller or other mechanical means until the in-place density is equal to or greater than ninety-five percent (95%) of the maximum modified Proctor dry density as determined by ASTM D1557-12 methods. Lift thicknesses shall be adjusted depending on the available compaction equipment. All fill materials shall be moisture conditioned to within three (3%) percent of the optimum moisture content at the time of placement. The moisture content of the fill materials shall be maintained as deemed necessary to aid in attaining the required compaction and to maintain overall stability (minimal pumping, yielding and/or rutting).

## 3.12 COMPACTION OF GRANULAR FILL MATERIAL AND/OR SUBBASE MATERIALS

- A. Predominately granular fill material and/or subbase materials shall be placed in layers not exceeding twelve (12")-inches in loose thickness. Each lift of granular fill shall be compacted with a vibratory roller or large plate tamper until the in-place density of the material is equal to or greater than seventy (70%) percent relative density as determined by ASTM D-4523 and D-4254 methods. Where a representative density test cannot be obtained, each lift shall be compacted to a visually observable stable condition as determined by the Owner and/or Owner's Representative.

## 3.13 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.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
1. Unpaved Areas: Plus, or minus one (1")-inch.
  2. Pavements: Plus, or minus one-half (1/2")-inch.
  3. Turf Fields: As directed by Field Consultant or indicated on Field Plans
  4. Courts: As directed by the Engineer or indicated on Court Plans

## 3.14 SUBBASE AND BASE COURSES

- A. Place subbase and base course on subgrades free of mud, frost, snow, or ice.

## 3.15 DRAINAGE COURSE

- A. Place drainage courses on subgrades free of mud, frost, snow, or ice.

## 3.16 FIELD QUALITY CONTROL

- A. Testing Agency: The Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing. The Contractor shall engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing to meet the conditions of the PennDOT HOP (if applicable) at no additional cost to the Owner.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. Testing agency will test compaction of soils in place according to ASTM D 2922, as applicable.

- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained. Perform remedial work at no additional cost to the Owner.

### 3.17 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 when completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
  - 1. Scarify or remove and replace soil material to depth as directed by Owner; reshape and re-compact.
- C. Remove finished surfacing, backfill with additional soil and/or aggregate material, compact, and reconstruct surfacing when settling occurs before project correction period has elapsed.
  - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

### 3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Transport surplus (including excess trench material) and suitable waste materials that cannot be placed to a fully permitted facility off the project site at no additional cost to the Owner.

**TABLE A**  
**Geotextile Physical Requirements<sup>(1)(2)</sup>**

| Fabric Properties                             | Test Method  | Construction Class                                   |                                                      |                                                      |                                |                                                     |
|-----------------------------------------------|--------------|------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|--------------------------------|-----------------------------------------------------|
|                                               |              | Class 1                                              | Class 3                                              |                                                      | Class 4                        |                                                     |
|                                               |              | Subsurface Drainage                                  | Sediment Control                                     |                                                      | Separation and Erosion Control | Stabilization and GRS Abutments                     |
|                                               |              |                                                      | Type A                                               | Type B                                               | Type A                         | Type C                                              |
| Fabric Structure                              | N/A          | Woven Monofilament                                   | Woven Slit Film                                      | Woven Slit Film                                      | Non-woven Needle Punched       | Woven Polypropylene                                 |
| Weight, oz/sy                                 | ASTM D5261   | N/A                                                  | N/A                                                  | N/A                                                  | 12.0 min                       | N/A                                                 |
| Grab Tensile Strength, lbs. <sup>(3)</sup>    | ASTM D4632   | 365 min MD x 190 min XD                              | 185 min MD and XD                                    | 115 min MD and XD                                    | 305 min MD and XD              | N/A                                                 |
| Grab Tensile Elongation, % <sup>(3),(5)</sup> | ASTM D4632   | 22 to 34 MD x 9 to 26 XD                             | 13 to 31 MD and XD                                   | 13 to 31 MD and XD                                   | 50 min MD and XD               | N/A                                                 |
| Ultimate Wide Width Tensile Strength, lb/ft   | ASTM D4595   | N/A                                                  | N/A                                                  | N/A                                                  | N/A                            | 4,800 min MD and XD                                 |
| Wide Width Tensile Strength@ 2% Strain, lb/ft | ASTM D4595   | N/A                                                  | N/A                                                  | N/A                                                  | N/A                            | Design Specific <sup>(4)</sup>                      |
| Puncture, lbs. (2-in flat- end rod)           | ASTM D6241   | 660 min                                              | 700 min                                              | 440 min                                              | 830 min                        | 1,700 min                                           |
| Trapezoid Tear Strength, lbs.                 | ASTM D4533   | 95 min MD x 75 min XD                                | 70 min MD and XD                                     | 50 min MD and XD                                     | 110 min MD and                 | 170 min MD and XD                                   |
| Apparent Opening Size, mm (Sieve No.)         | ASTM D4751   | 0.30 to 0.60 (No. 50 to No. 30 sieve) <sup>(5)</sup> | 0.21 to 0.43 (No. 70 to No. 40 sieve) <sup>(5)</sup> | 0.30 to 0.60 (No. 50 to No. 30 sieve) <sup>(5)</sup> | 0.15 max                       | 0.425 to 0.85 (No 40 to No 20 sieve) <sup>(5)</sup> |
| Percent Open Area, %                          | COE CW-02215 | 9.0 to 12.0 <sup>(5)</sup>                           | N/A                                                  | N/A                                                  | N/A                            | N/A                                                 |
| Permittivity, sec <sup>-1</sup>               | ASTM D4491   | 1.9 min                                              | 0.05 min <sup>(5)</sup>                              | 0.05 min <sup>(5)</sup>                              | 0.70 min                       | 0.40 min <sup>(5)</sup>                             |
| Water Flow Rate,                              | ASTM D4491   | 130 min                                              | N/A                                                  | N/A                                                  | N/A                            | 25 min                                              |
| Ultraviolet Resistance Strength Retention, %  | ASTM D4355   | 90 @ 500 hrs min                                     | 70 @ 500 hrs min                                     | 70 @ 500 hrs min                                     | 70 @ 500 hrs                   | 70 @ 500 hrs min                                    |

- (1) The numerical values indicate the required minimum or maximum (as indicated) average values for ten test specimens. No more than 20% of the individual specimens may have a value less than the required minimum value or greater than the required maximum value (as indicated), except as noted (see Note 5).
- (2) MD = Machine Direction, XD = Cross Machine Direction
- (3) Test conducted using 1/32 inch thick neoprene pads on grip faces having a Shore A durometer value of 70±5.
- (4) Wide width tensile strength at 2% strain in both the machine and cross machine directions (MD x XD), must be greater than or equal to required design tensile strength.
- (5) The numerical values indicate the allowable range or required minimum (as indicated) based upon the numerical average of all test specimens from a sample.

END OF SECTION 02300

**02300 EARTHWORK**

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## SECTION 02305 - DEWATERING

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings, Approved Permits, and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Gateway Engineers, Inc. Geotechnical Engineering Investigation Report (April 2, 2024).

## 1.2 SUMMARY

- A. The section includes requirements for dewatering.
- B. Related Sections:
  - 1. Division 2 Section "Earthwork" for preparing subgrades for pavements, lawns, grasses and landscaping.
  - 2. Division 2 Section "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.
  - 3. Division 2 Section "Trench Excavation and Backfill for Sewers and Utilities" for trench excavation and backfill requirements for sewers and utilities.

## 1.3 PERFORMANCE REQUIREMENTS

- A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed in dry, stable trenches and subgrades.
  - 1. Delegated Design: Design dewatering system, including comprehensive engineering analysis by a registered Pennsylvania Professional Engineer, using performance requirements and design criteria indicated.
  - 2. Continuously monitor and maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
  - 3. Prevent surface water from entering excavations by grading, dikes, or other means.
  - 4. Accomplish dewatering without damaging existing buildings, structures, and site improvements adjacent to the excavation.
  - 5. Remove dewatering system when no longer required for construction.

#### 1.4 SUBMITTALS

- A. Shop Drawings: For dewatering system. Show arrangement, locations, and details of wells and well points; locations of risers, headers, filters, pumps, power units, and discharge lines; and means of discharge, control of sediment, and disposal of water.
  - 1. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.
  - 2. Include a written plan for dewatering operations including control procedures to be adopted if dewatering problems arise.
- B. Delegated Design Submittal: For dewatering system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the registered Pennsylvania Professional Engineer responsible for their preparation.
- C. Field quality control reports.
- D. Other Informational Submittals:
  - 1. Photographs: Show existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by dewatering operations.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer that specializes in the design and installation of dewatering systems and dewatering work.
- B. Regulatory Requirements: Comply with governing DEP notification regulations before beginning dewatering. Comply with hauling and disposal regulations of authorities having legal control.
- C. Pre-installation Conference: Conduct conference at project site.
  - 1. Review methods and procedures related to dewatering including, but not limited to, the following:
    - a. Inspection and discussion of condition of site to be dewatered including coordination with temporary erosion control measures and temporary controls and protections.
    - b. Proposed site clearing and excavations.
    - c. Existing utilities and subsurface conditions.
    - d. Coordination for interruption, shutoff, capping, and continuation of utility services.
    - e. Construction schedule: verify availability of Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
    - f. Testing and monitoring of dewatering system.

## 1.6 PROJECT CONDITIONS

- A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by the Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to the requirements indicated:
1. Notify the Owner and Facility Owner no fewer three (3) days in advance of proposed interruption of utility.
  2. Do not proceed with interruption of utility without Owner's and/or Facility Owner's written permission.
- B. Survey Work: Engage a registered Pennsylvania Land Surveyor or Professional Engineer to survey adjacent existing buildings, structures, and site improvements, establishing exact elevations at fixed points to function as benchmarks. Clearly identify benchmarks and record existing elevations.
1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Owner if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.
- C. Project Site Information (If Applicable): A Geotechnical Engineering Investigation Report and/or Boring Logs have been prepared for this Project and is intended for Engineer design purposes only and is made available to Bidders only that they may have access to identical subsurface information available to the Owner. It is presented in good faith and are not intended as a substitute for the personal investigations, interpretations, or judgements of the Contractor. The Owner and/or Engineer expressly deny all responsibility for interpretations drawn from or judgements made on this data.
- D. The Contractor shall be allowed to make additional test borings and conduct reasonable exploratory operations necessary for bulk excavation and utility installations upon written request to the Owner within time periods referenced elsewhere in these Specifications.

## PART 2 - PRODUCTS (Not Used)

## 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 dewatering operations.
  - 1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding area.
  - 2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
- B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having legal control. Provide alternate routes around closed or obstructed traffic ways if required by authorities having legal control.
- C. Provide temporary grading to facilitate dewatering and control of surface water.
- D. Monitor dewatering systems continuously.
- E. Promptly repair damage to adjacent facilities caused by dewatering.
- F. Protect and maintain temporary erosion and sedimentation controls, which are specified in Division 2 Section "Site Clearing and Preparation" during dewatering operations.

## 3.2 INSTALLATION

- A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.
  - 1. Space well points or wells at intervals required to provide sufficient dewatering.
  - 2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.
- B. Before excavating below ground-water level, place the system into operation to lower water to specified levels. Operate the system continuously until drains, sewers, and structures have been constructed and the fill materials have been placed or until dewatering is no longer required.



- C. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.
  - 1. Do not permit open sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
- D. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.
  - 1. Maintain piezometric water level a minimum of twenty-four (24")-inches below surface of excavation.
- E. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having legal control.
- F. Provide standby equipment on site, installed and available for immediate operation, to maintain dewatering on a continuous basis if any part of the system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to Owner.
  - 1. Remove dewatering system from project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of thirty-six (36")-inches below overlying construction.
- G. Damages: Promptly repair damage to adjacent facilities caused by dewatering operations.

### 3.3 FIELD QUALITY CONTROL

- A. Observation Wells: Provide, take measurements, and maintain at least the minimum number of observation wells or piezometers indicated; additional observation wells may be required by authorities having legal control.
  - 1. Observe and record daily elevation of ground water and piezometric water levels in observation wells.
  - 2. Repair or replace, within twenty-four (24) hours, observation wells that become inactive, damaged, or destroyed. In areas where observation wells are not functioning properly, suspend construction activities until reliable observations can be made. Add or remove water from observation-well risers to demonstrate that observation wells are functioning properly.
  - 3. Fill observation wells, remove piezometers, and fill holes when dewatering is completed.
- B. Provide continual observation to ensure that subsurface soils are not being removed by the dewatering operation.

END OF SECTION 02305

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#### 02305 DEWATERING

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## SECTION 02310 – TRENCH EXCAVATION AND BACKFILL FOR SEWERS AND UTILITIES

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings, Approved Permits, 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 requirements for trench excavation and backfill for sewer and utility trenches.
- B. Related Sections include the following:
  - 1. Division 1 Section “General Project Requirements” for all general project requirements that apply to the Work to be completed.
  - 2. Division 1 Section “Earthwork” for additional requirements.
  - 3. Division 2 Section “Storm Drainage” for installation of storm sewer systems.
  - 4. Division 2 Section “Asphalt Paving” for installation of bituminous asphalt pavement.

## 1.3 DEFINITIONS

- A. PennDOT: Pennsylvania Department of Transportation
- B. Backfill: Soil material or approved aggregate material used to fill a bulk excavation or trench excavation.
  - 1. Initial Backfill (“Pipe Zone”): Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe. This area shall be defined from the invert of pipe to one (1’)-foot above the crown of the pipe for the full width (12”-minimum either side of the pipe) and length of the trench.
  - 2. Final Backfill: Approved soil or aggregate material used to fill a trench to final limits.
- C. Bedding Course: Six (6”)-inches (minimum) of approved AASHTO #57 limestone placed over the excavated subgrade in a trench for the full width and length of the trench before placing pipe.
- D. Borrow Soil: Satisfactory soil, free of organic or other deleterious material imported from off-site for use as backfill.

- E. Trench Excavation: Removal of all material encountered above subgrade elevations and to lines and dimensions indicated regardless of the type of material encountered.
1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by the Owner and/or Owner's Representative. Authorized additional excavation and replacement material will be paid for according to applicable Contract provisions.
  2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Owner and/or Engineer. Unauthorized excavation, as well as remedial work directed by the Owner's Representative or Owner to correct unauthorized excavation, shall be at the Contractor's sole cost and expense.
- F. Fill: Soil materials used to raise existing grades.
- G. Pipe Zone: The area from the bedding course to one (1') foot above the top of the pipe for the full width and length of the trench.
- H. Sewers and Utilities: On-site underground pipes, conduits, ducts and cables within the project limits.

#### 1.4 SUBMITTALS

- A. Product Data: For the following:
1. PennDOT 2A limestone
  2. AASHTO #57 limestone
  3. Masonry sand

#### 1.5 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Facility Owner, property owners, and the Owner or others unless permitted in writing by the Facility Owner and the Owner and then only after arranging to provide temporary utility services according to requirements indicated.
1. Notify the Facility Owner, property owners, and the Owner not less than three (3) days in advance of proposed utility interruptions.
  2. Do not proceed with utility interruptions without Owner's written permission.
  3. Contact utility-locator service for area where project is located before excavating.
  4. Perform a GPR survey to the level indicated 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.

- C. Project Site Information (if applicable) A Geotechnical Engineering Investigation Report and/or Boring Logs have been prepared for this Project and is intended for Engineer design purposes only and is made available to Bidders only that they may have access to identical subsurface information available to the Owner. It is presented in good faith and is not intended as a substitute for the personal investigations, interpretations, or judgements of the Contractor. The Owner and/or Engineer expressly deny all responsibility for interpretations drawn from or judgements made on this data.
1. The Contractor shall be allowed to make additional test borings and conduct reasonable exploratory operations necessary for bulk excavation and utility installations upon written request to the Owner within time periods referenced elsewhere in these Specifications.
- D. The Geotechnical Engineering Investigation Report and/or Boring Logs (if applicable) are referenced elsewhere in these Specifications.

## PART 2 - PRODUCTS

### 2.1 AGGREGATE MATERIALS

- A. PennDOT 2A limestone and/or AASHTO #57 limestone: Meet specifications set forth in PennDOT Publication 408 (most current edition), Section 703. Suppliers must be listed on PennDOT Bulletin 14.
- 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 Owner's Representative and/or the Owner.
- 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 Owner's Representative and/or the Owner.
- C. Surplus Excavated Material: Surplus material created by placement of pipe and aggregate bedding and/or aggregate backfill in the excavated trench shall become the Contractor's property and be removed from the site at no additional cost to the Owner.

## PART 3 - EXECUTION

## 3.1 GENERAL REQUIREMENTS

- A. Where the location and depth of existing utilities are of concern in maintaining proposed line and grade, the Contractor may be directed to make exploratory excavations to verify that the design lines and grades can be achieved or for making adjustments as approved by the Owner and/or Engineer. Payment for exploratory excavation shall be applicable Contract provisions.
- B. The Contractor shall be responsible for the protection of all sewers and utilities in the trench and pipe zone using Contractor-determined methods at no additional cost to the Owner. Any damage to gas, water, telephone, power, cable, or sewer lines shall be repaired immediately to the complete satisfaction of the Facility Owner. In no event shall any sewer or utility service remain interrupted overnight.
- C. The Contractor shall protect structures, sidewalks, pavements, walls, and other facilities and objects from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by trenching operations using Contractor-determined methods at no additional cost to the Owner.
- D. Pennsylvania Act 287 of 1974 as amended by Act 50 of 2017, 73 P.S. 176 et. Seq. contains provisions for each stakeholder regarding the reporting of alleged violations. The report should be submitted to the Pennsylvania Public Utility Commission through the One Call System pursuant to the time frame set forth in Act 50 of 2017.
  - 1. Facility Owner – Submit a report of alleged violation not more than thirty (30) business days after receipt of notice that the facility owner's lines have been damaged by excavation or demolition work or if the facility owner believes a violation of the Act has been committed in association with excavation or demolition work. No report may be required where the cost to repair the damage to the facility owner's lines is less than two thousand five hundred dollars (\$ 2,500.00), unless the same person damaged the facility owner's lines two (2) or more times within a six (6)-month period.
  - 2. Designer – Submit a report of alleged violation not more than thirty (30) business days from the time the designer becomes aware that a violation of this Act may have been committed in association with excavation or demolition work.
  - 3. Excavator – Submit a report of an alleged violation not more than thirty (30) business days after striking or damaging a facility owner's line during excavation or demolition or if the excavator believes a violation of this Act has been committed in association with excavation or demolition work. Excavators shall **immediately** notify the Designer and Project Owner after striking or damaging a facility owner's line. Failure to notify the Designer and Project Owner will result in the assumption of payment for all fines that may be assessed to the Designer and/or the Project Owner.
  - 4. Project Owner – Submit a report of alleged violation not more than thirty (30) business days after striking or damaging a facility owner's line during excavation or demolition work activities, after a project owner's contracted excavator strikes or damages a facility owner's line during excavation or demolition activities or if the project owner believes a violation of this Act has been committed in association with excavation or demolition

### 3.2 DEWATERING AND BYPASS

- A. Prevent surface water and ground water from entering trench excavations, from ponding on prepared subgrades, and from flooding project site and surrounding area. All Bidders should note that the proposed Work will require management of existing surface and conduit water at all times during the course of the work. Methodology to control said water will be at the Contractor's discretion and cost and be considered incidental to the bid item(s) deemed most appropriate by the Contractor.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
  - 1. Reroute surface water runoff away from trenching areas. Do not allow water to accumulate in trenches. Do not use excavated trenches or existing piping as temporary drainage ditches or conduits.
  - 2. Install a dewatering system specified in Division 2 Section "Dewatering," to keep subgrades and trenches dry and convey surface water away from excavations. Maintain until dewatering is no longer required.

### 3.3 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 as shown on the Plans and according to manufacturer's minimum recommended trench widths.
- C. All excavations shall be kept free from water, snow, and ice during construction.
- D. Mats shall be placed for excavation equipment where damage could be caused to existing pavements.
- E. The minimum trench width shall be the outside diameter of the pipe plus twelve (12")-inches on each side of the pipe to ensure proper compaction of the bedding and backfill or as recommended by the pipe manufacturer, whichever is greater. The maximum trench width shall conform to current ASTM and OSHA requirements predetermined by the depth of the excavation and pipe size or as required by site conditions. No additional compensation will be considered for required trench widths caused by existing site conditions or necessary to meet ASTM, OSHA, or pipe manufacturer requirements.
- F. 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 taken to ensure that pipes, when installed, will not rest on rock, masonry or any other material that would present a non-uniform foundation. The Contractor shall excavate the trench so that all pipes are laid in conformance with the applicable Detail when two (2) or more pipes are laid in the same trench.
- G. All trench excavations shall be considered as unclassified excavation subject to all requirements listed elsewhere in these Specifications.

- H. Excavation below Required Grade: Excavation below the grade of pipes or subsurface structures shown on the Drawings necessitated by changes in grades in accordance with the directions of the Owner and/or Owner's Representative will be paid for under "Authorized Additional Excavation", as herein defined. Excavation carried below the required level without authorization by the Owner and/or Engineer shall be backfilled at the Contractor's expense with aggregate material as approved by the Owner and/or Engineer. Compaction of such backfill material shall be as specified elsewhere herein.
- I. Excavation in Paved Areas: When excavations are to be made in paved surfaces, the paved surfaces shall be neatly cut one (1') foot beyond each side of the trench and ahead of the excavation by means of pneumatic tool, saw cutting or other approved tools to provide a clean, uniform edge, with minimum disturbance of remaining pavements. The pavements so removed shall not be used for trench backfill but shall be disposed of off-site in an approved manner.
- J. Surplus Excavated Material: The Contractor shall remove all excess excavated material, including material removed from the trench due to the placement of pipe and aggregate bedding and backfill, from the site or haul it to an on-site Owner-approved stockpile for removal before project completion at no additional cost to the Owner.
- K. Authorized Changes and/or Alterations: The Owner and/or Owner's Representative may, because of unforeseen conditions arising during the progress of the work, order the grade or location of any pipe or other structure changed from that established on the Plans.
- L. Credit to Owner: Should such changes or alterations result in a reduction in the quantity of earth excavation, a credit to the Owner for the reduction in the amount of earth trench excavation occasioned by such change shall be made.
- M. Payment for trench excavation, aggregate bedding/backfill, select on-site backfill and off-site removal of surplus excavated material, including material caused by placement of pipe and aggregate bedding and backfill, shall be included in the pipe and manhole Bid Price Unit Item.

### 3.4 TRENCH BEDDING

- A. Aggregate Bedding: Trench bedding shall consist of a minimum of six (6")-inches of approved AASHTO #57 limestone installed for the entire length and width of the trench. Bedding shall be compacted using mechanical compaction equipment to compaction requirements listed on the Details and manufacturer's recommendations.

### 3.5 TRENCH BACKFILL FOR SEWERS AND SEWER STRUCTURES

- A. Backfill in the pipe zone shall consist of approved AASHTO #57 limestone placed a minimum of six (6")-inches below the pipe (trench bedding) and a minimum of twelve (12")-inches above the crown of the pipe compacted in six (6")-inch layers to compaction requirements listed on the Details and manufacturer's recommendations.
- B. In Non-Critical Settlement Areas, the backfill shall be select on-site backfill (as defined elsewhere in these Specifications) to within six (6")-inches from the final elevation to allow for topsoil placement and compaction.

## C. In Critical Settlement Areas:

1. The backfill shall be full depth aggregate backfill to below the elevation of the proposed impervious surface. The aggregate backfill shall be approved PennDOT 2A limestone above the pipe zone placed in six (6")-inch layers and mechanically compacted to the required densities.
  2. All excavations under and within four (4') feet of any roadway edge, curbing, paved or aggregate surface, structure, wall or other improved surface shall be backfilled with approved compacted PennDOT 2A limestone to suitable tolerances from the final elevation to allow for placement of final surface (bituminous paving, concrete, aggregate, etc.). Excavations for tanks and tanking will be subject to the above conditions.
- D. All backfill material shall be compacted using mechanical compaction equipment to the listed densities.
- E. Backfilled areas which settle prior to the expiration of the warranty period shall be repaired at the Contractor's sole expense to the complete satisfaction of the Owner.

## 3.6 UNSUITABLE MATERIALS

- A. If unsuitable material, as determined by the Owner and/or Owner's Representative, is found at the trench bottom, the Contractor shall be required to excavate below grade and stabilize the trench by "punching" AASHTO #1 crushed limestone into the subgrade to create a "working surface" deemed adequate by the Owner's Representative using limestone meeting the specifications set forth in the current Edition of the Pennsylvania Department of Transportation's Publication 408, Section 703.2(c), and Table C. Payment for excavation and placement of such material shall be by applicable Contract provisions. No payment for unsuitable replacement will be allowed unless specifically directed by the Owner and/or Engineer.

## 3.7 COMPACTION OF COHESIVE FILL MATERIAL

- A. All cohesive fill materials placed as general fill to backfill trenches should be placed in horizontal layers. All cohesive fill materials should be placed in maximum twelve (12")-inch thick loose lifts and compacted with a sheepsfoot, segmented wheel roller or other mechanical means until the in-place density is equal to or greater than ninety-five percent (95%) of the maximum modified Proctor dry density as determined by ASTM D1557-12 methods. Lift thicknesses should be adjusted depending on the available compaction equipment. All fill materials should be moisture conditioned to within three (3%) percent of the optimum moisture content at the time of placement. The moisture content of the fill materials should be maintained as deemed necessary to aid in attaining the required compaction and to maintain overall stability (minimal pumping, yielding, and/or rutting).



### 3.8 COMPACTION OF GRANULAR FILL MATERIAL AND/OR SUBBASE MATERIALS

- A. Predominately granular fill material and/or subbase materials should be placed in layers not exceeding twelve (12'')-inches in loose thickness. Each lift of granular fill should be compacted with a vibratory roller or large plate tamper until the in-place density of the material is equal to or greater than seventy (70%) relative density as determined by ASTM D-4523 and D-4254 methods. Where a representative density test cannot be obtained, each lift should be compacted to a visually observable stable condition as determined by the Owner and/or Owner's Representative.

### 3.9 FIELD QUALITY CONTROL

- A. Testing Agency: The Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing. The Contractor shall engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing to meet the conditions of the PennDOT HOP (if applicable) at no additional cost to the Owner.
- B. Allow the Testing Agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. The Testing Agency will test compaction of soils in place according to ASTM D 2922, as applicable.
- D. When the Testing Agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify, and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

### 3.10 TRENCH BACKFILL FOR UTILITIES

- A. The Contractor shall backfill trenches for utilities in accordance with the requirements of the Facility Owner having authority for the utility being installed at no additional cost to the Owner.

END OF SECTION 02310

## SECTION 02315 - EXCAVATION SUPPORT AND PROTECTION

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

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

## 1.2 SUMMARY

- A. The Section includes temporary excavation support and protection systems.
- B. Related Sections:
  - 1. Division 2 Section "Dewatering" for dewatering system for excavations.

## 1.3 PERFORMANCE REQUIREMENTS

- A. The Contractor shall design, furnish, install, monitor, and maintain an excavation support and protection system capable of supporting excavation sidewalls, resisting soil and hydrostatic pressure and superimposed and construction loads to all adjacent existing buildings, structures, site improvements and utilities. It shall be the Contractor's sole responsibility to determine all instances where an excavation support and protection system is necessary. All damage to any unsupported existing building, structure, site improvement or utility shall be repaired by the Contractor to the Facility Owner's and/or property owner's complete satisfaction at no additional cost to the Owner.
  - 1. Delegated Design: Design excavation support and protection system, including comprehensive engineering analysis by a registered Pennsylvania Professional Engineer, using performance requirements and design criteria indicated.
  - 2. Prevent surface water from entering excavations by grading, dikes, or other means.
  - 3. Install excavation support and protection systems without damaging existing buildings, structures, site improvements and utilities adjacent to excavation.
  - 4. Monitor vibrations, settlements, and movements.

## 1.4 SUBMITTALS

- A. Shop Drawings: For excavation support and protection system.
- B. Delegated Design Submittal: For excavation support and protection system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by a registered Pennsylvania Professional Engineer responsible for their preparation.
- C. Other Informational Submittals:
  - 1. Photographs and/or Videos: Clearly show existing exterior and interior conditions of adjacent construction, buildings, houses, site improvements and utilities that may be construed as damaged because of the absence of, the installation of, or the performance of excavation support and protection systems. The Contractor shall submit all documentation to the Owner and/or Engineer for approval prior to beginning work.
  - 2. Record Drawings: Identify and locate capped utilities and other subsurface structural, electrical, or mechanical conditions.
    - a. Note locations and capping depth of wells and well points.

## 1.5 QUALITY ASSURANCE

- A. Pre-installation Conference: Conduct conference at project site.
  - 1. Review methods and procedures related to excavation support and protection system including, but not limited to, the following:
    - a. Existing utilities and subsurface conditions.
    - b. Facility Owner requirements.
    - c. Proposed excavations.
    - d. Proposed equipment.
    - e. Monitoring of excavation support and protection system.
    - f. Working area location and stability.
    - g. Abandonment or removal of excavation support and protection system.

## 1.6 PROJECT CONDITIONS

- A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by the Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to the requirements indicated:
1. Notify Owner and/or Facility Owner no fewer than three (3) days in advance of proposed interruption of utility.
  2. Do not proceed with interruption of utility without Owner's or Facility Owner's written permission.
- B. Survey Work: The Contractor shall engage a registered Pennsylvania Land Surveyor or Professional Engineer to survey adjacent existing buildings, structures, and site improvements to establish exact elevations as fixed points to act as benchmarks. The established benchmarks shall clearly be identified and shown on the record drawing.
1. During installation of excavation support and protection systems, the Contractor shall regularly re-survey benchmarks and maintain an accurate log of surveyed elevations and positions for comparison with original elevations and positions. The Contractor shall promptly notify the Owner and/or Owner's Representative if changes in elevations or positions occur or if cracks, sags, or other damage becomes evident in adjacent construction.
- C. Project Site Information (as applicable): A Geotechnical Investigation Report and/or Boring Logs have been prepared for this Project and are intended for Engineer design purposes only and are made available to Bidders only that they may have access to identical subsurface information available to the Owner. They are presented in good faith and are not intended as a substitute for the personal investigations, interpretations, or judgements of the Contractor. The Owner and/or Engineer expressly deny all responsibility for interpretations drawn from or judgements made on this data.
1. The Contractor shall be allowed to make additional test borings and conduct reasonable exploratory operations necessary for bulk excavation and utility installations upon written request to the Owner within time frames referenced elsewhere in these Specifications.
- D. The Geotechnical Investigation Report and/or Boring Logs are referenced elsewhere in these Specifications (as applicable).

## PART 2 - PRODUCTS

## 2.1 MATERIALS

- A. General: Provide materials that are either new or in serviceable condition.
- B. Structural Steel: ASTM A 36/A 36M, ASTM A 690/A 690M, or ASTM A 992/A 992M.
- C. Steel Sheet Piling: ASTM A 328/A 328M, ASTM A 572/A 572M, or ASTM A 690/A 690M; with continuous interlocks.
  - 1. Corners: Site fabricated mechanical interlock
- D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness of size and strength required for application.
- E. Cast-in-Place Concrete: ACI 301, of compressive strength required for application.
- F. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- G. Tiebacks: Steel bars, ASTM A 722/A 722M.
- H. Tiebacks: Steel strand, ASTM A 416/A 416M.

## PART 3 - EXECUTION

## 3.1 PREPARATION

- A. Protect existing structures, utilities, sewers, sidewalks, pavements, walls, buildings, houses and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
  - 1. Shore, support, and protect encountered structures, utilities, sewers, sidewalks, pavements, walls, buildings, houses, and other facilities according to the Facility Owners' requirements at no additional cost to the Owner.
- B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having legal control. Provide alternate routes around closed or obstructed traffic ways if required by authorities having legal control.
- C. Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces are not impeded.

- D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.
- E. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

### 3.2 SOLDIER PILES AND LAGGING

- A. Install steel soldier piles before starting excavation. Extend soldier piles below excavation grade level to depths adequate to prevent lateral movement. Space soldier piles at regular intervals not to exceed allowable flexural strength of wood lagging. Accurately align exposed faces of flanges to vary not more than two (2")- inches from a horizontal line and not more than 1:120 out of vertical alignment.
- B. Install wood lagging within flanges of soldier piles as excavation proceeds. Trim excavation as required to install lagging. Fill voids behind lagging with soil, and compact.
- C. Install wales horizontally at locations indicated on the developed drawings and secure to soldier piles.

### 3.3 SHEET PILING

- A. Before starting excavation, install one-piece sheet piling lengths and tightly interlock to form a continuous barrier. Accurately place the piling, using templates and guide frames unless otherwise recommended in writing by the sheet piling manufacturer. Limit vertical offset of adjacent sheet piling to sixty (60')-inches. Accurately align exposed faces of sheet piling to vary not more than two (2") inches from a horizontal line and not more than 1:120 out of vertical alignment. Cut tops of sheet piling to uniform elevation at top of excavation.

### 3.4 TIEBACKS

- A. Tiebacks: Drill, install, grout, and tension tiebacks. Test load-carrying capacity of each tieback and replace and retest deficient tiebacks.
  - 1. Test loading shall be observed by a qualified professional engineer responsible for the design of excavation support and protection system.
  - 2. Maintain tiebacks in place until permanent construction can withstand lateral soil and hydrostatic pressures.

## 3.5 REMOVAL AND REPAIRS

- A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.
1. Remove excavation support and protection systems to a minimum depth of forty-eight (48")-inches below overlaying construction and abandon remainder.
  2. Fill voids immediately with approved backfill compacted to density specified in Division 2 Section "Earthwork."
  3. Repair or replace, as approved by Owner, adjacent work damaged or displaced by removing excavation support and protection systems.

END OF SECTION 02315

## SECTION 02510 WATER DISTRIBUTION

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings, Approved Permits, 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 water distribution piping and related components for water service.

## 1.3 DEFINITIONS

- A. DIP: Ductile iron pipe.
- B. PVC: Polyvinyl chloride plastic.
- C. PE: Polyethylene pipe.
- D. PEX: Crosslinked polyethylene
- E. ACHD: Allegheny County Health Department (if applicable).
- F. PAWC: Pennsylvania American Water Company (if applicable).

## 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Submit to Engineer, PAWC, and ACHD as applicable for approval prior to ordering material. Do not order or incorporate into the Work any unapproved material.
- B. Operation and Maintenance Data: For water valves and specialties to include in emergency, operation, and maintenance manuals.



## 1.5 QUALITY ASSURANCE

## A. Regulatory Requirements:

1. Comply with all standards of PAWC and ACHD (if applicable) for potable-water-service piping, including materials, installation, testing, and disinfection.
2. Comply with all requirements of ACHD's Rules and Regulations for Plumbing and Building Drainage (if applicable).

## B. Piping materials shall bear label, stamp, or other markings of specified testing agency.

## C. Comply with ASTM F 645 for selection, design, and installation of thermoplastic water piping.

## D. NFPA Compliance: Comply with NFPA 24 for materials, installations, tests, flushing, and valve and hydrant supervision for fire-service-main piping for fire suppression.

## E. NSF Compliance:

1. Comply with NSF 14 for plastic potable-water-service piping.
2. Comply with NSF 61 for materials for water-service piping and specialties for domestic water.

## 1.6 DELIVERY, STORAGE, AND HANDLING

## A. Preparation for Transport: Prepare valves, including fire hydrants, according to the following:

1. Ensure that valves are dry and internally protected against rust and corrosion.
2. Protect valves against damage to threaded ends and flange faces.
3. Set valves in best position for handling. Set valves closed to prevent rattling.

## B. During Storage: Use precautions for valves, including fire hydrants, according to the following:

1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
2. Protect from weather. Store indoors and maintain temperature higher than ambient dew-point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.

## C. Handling: Use sling to handle valves and fire hydrants if size requires handling by crane or lift. Rig valves to avoid damage to exposed parts. Do not use hand wheels or stems as lifting or rigging points.

## D. Deliver piping 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.

## E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.

## F. Protect flanges, fittings, and specialties from moisture and dirt.

## G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

## 1.7 PROJECT CONDITIONS

- A. Interruption of Existing Water Distribution 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 water distribution service according to requirements indicated:
  - 1. Notify Facility Owner, property owners, the Owner, and the Engineer no fewer than three (3) days in advance of the proposed interruption of service.
  - 2. Do not proceed with interruption of water distribution service without Facility Owner's, the Owner's and the Engineer's written permission.
- B. Project Site Information (if applicable): A Geotechnical Engineering Investigation Report and/or Boring Logs have been prepared for this Project and is intended for Engineer design purposes only and is made available to Bidders only that they may have access to identical subsurface information available to the Owner. It is presented in good faith and is not intended as a substitute for the personal investigations, interpretations, or judgements of the Contractor. The Owner and/or Engineer expressly deny all responsibility for interpretations drawn from or judgements made on this data.
  - 1. The Contractor shall be allowed to make additional test borings and conduct reasonable exploratory operations necessary for bulk excavation and utility installations upon written request to the Owner within time periods referenced elsewhere in these Specifications.
- C. The Geotechnical Engineering Investigation Report and/or Boring Logs are referenced elsewhere in these Specifications (if applicable).

## 1.8 COORDINATION

- A. Coordinate connection to water main with Facility Owner and Owner.

## PART 2 - PRODUCTS

## 2.1 DUCTILE IRON PIPE, FITTINGS AND APPURTENANCES

- A. Push-on-Joint, Ductile Iron Pipe: AWWA/ANSI C151/A21.51, Thickness Class 52 with push-on-joint bell and plain spigot end unless grooved or flanged ends are indicated. All pipe shall be cement mortar lined. One-eighth (1/8")-inch (double thickness) on the inside and coal tar coated on the outside; lining and coating to comply with ANSI A21.50.
1. Mechanical Joint Ductile Iron Fittings: AWWA/ANSI C153/A21.53. Ductile iron mechanical joint fittings 3" through 24" shall be rated for 350 psi working pressure. All fittings shall be cement mortar lined. Fittings shall have an asphaltic outside coating in accordance with ANSI/AWWA C153/A21.53.
  2. Rubber Gaskets: AWWA/ANSI C111/A21.11. All joints and fittings must be restrained by use of Field-Loc gaskets, Meg-a-lugs, and/or thrust blocking.
  3. Thickness Design: AWWA/ANSI C150/A21.50.
  4. Cement Mortar Lining: AWWA/ANSI C104/A21.
  5. Restraining Glands: AWWA/ANSI C110/A21.20. The devices shall have a working pressure rating of 350 psi for three (3")-inch to sixteen (16")-inch and 250 psi for eighteen (18")-inch to forty-eight (48")-inch. Ratings are for water pressure and must include a minimum safety factor of 2 to 1 in all sizes. Gland body, wedges and wedge actuating components shall be cast form Grade 65-45-12 ductile iron material in accordance with ASTM A536. Ductile iron gripping wedges shall be heat treated within a range of 370 to 470 BHN. Mechanical joint restraint for DIP shall be Megalug Series 1100 as manufactured by EBBA Iron, Inc. (or approved equal).
  6. Transition and Repair Couplings: Center rings shall be ductile cast iron meeting or exceeding ASTM 536 (latest revision). Gaskets shall be natural or synthetic rubber compounded for potable water use. End rings shall be ductile cast iron meeting or exceeding ASTM A536 (latest revision). Bolts and nuts shall be high strength steel track head, natural course roll thread with heavy hex nuts electro-galvanized with di-chromate seal.
- B. Class: All ductile iron pipe shall be thickness class 52.
- C. Polywrap: Polyethylene wrap shall be virgin polyethylene material conforming to the requirements of ANSI/ASTM D 1248. The minimum nominal thickness shall be eight (8) mils.
- D. Warning Tape: Warning tape shall be electronically locatable brightly colored plastic tape displaying the printed notation "Water". Tape shall be laid between backfilling lifts over the pipe, not less than two (2) feet above the pipe or less than two (2) feet below finished ground surface. In no event shall the tape be more than four (4) feet below the finished surface.
- E. Submittals: Submit to Engineer, PAWC and ACHD as applicable prior to ordering material. Do not incorporate material into the Work without written approval from Engineer, PAWC and ACHD (if applicable). Unapproved material incorporated into the Work may be subject to removal and replacement at no additional cost to the Owner.

## 2.2 COPPER TUBE, FITTINGS AND APPURTENANCES

- A. Soft Copper Tube: ASTM B 88, Type K, water tube, annealed temper.
  - 1. Copper tubing shall be “soft annealed” and shall conform to the standards for “Type K”, prescribed in ANSI/AWWA C800-89 Section A.2 for “Copper Water Tubing” and to ASTM, designation B42 and B 88-99, and current revisions thereof. It shall be free from grooving cracks, indentations, flaws and other defects. At intervals of not greater than one and one-half (1.5)-feet, the tubing shall bear clear permanent markings indicating the type and manufacturer.
- B. Fittings: “Flared” type fittings shall be used. Unions shall be extra heavy three-part unions. Each fitting shall bear a clear, permanent marking indicating the manufacturer. Fittings shall be of cast brass meeting the requirements of ASTM B62. They shall be well made to ensure uniformity in wall thickness and strength and shall be free from any defect which may affect their serviceability.
- C. Polywrap: Polyethylene wrap shall be virgin polyethylene material conforming to the requirements of ANSI/ASTM D 1248. The minimum nominal thickness shall be eight (8) mils.
- D. Submittals: Submit to Engineer, PAWC and ACHD as applicable prior to ordering material. Do not incorporate material into the Work without written approval from Engineer, PAWC and ACHD (if applicable). Unapproved material incorporated into the Work may be subject to removal and replacement at no additional cost to the Owner.

## 2.3 GATE VALVES

- A. AWWA, Cast-Iron Gate Valves:
  - 1. Non-rising-Stem, Resilient-Seated Gate Valves:
    - a. Description: Gray- or ductile-iron body and bonnet; with bronze or gray- or ductile-iron gate, resilient seats, bronze stem, and stem nut.
      - 1) Standard: AWWA C509.
      - 2) Minimum Pressure Rating: 250 psig.
      - 3) End Connections: Mechanical joint.
      - 4) Interior Coating: Complying with AWWA C550.
  - 2. O.S. & Y, Rising-Stem, Resilient-Seated Gate Valves:
    - a. Description: Cast- or ductile-iron body and bonnet, with bronze or gray- or ductile-iron gate, resilient seats, and bronze stem.
      - 1) Standard: UL 262 and FM 1120/1130
      - 2) Minimum Pressure Rating: 200 psig (1380 kPa).
      - 3) End Connections: Flanged.
      - 4) Interior Coating: Complying with AWWA C550.
  - 3. Submittals: Submit to Engineer, PAWC and ACHD (IF APPLICABLE) as applicable prior to ordering material.

## 2.4 GATE VALVE ACCESSORIES AND SPECIALTIES

### A. Tapping Sleeve Assemblies:

1. Description: Sleeve and valve compatible with tapping machine.
  - a. Standard: ANSI B16.1, class 125 and MSS SP-60.
  - b. Tapping Sleeve: Stainless-steel, two-piece bolted sleeve with flanged outlet for new branch connection. Include sleeve matching size and type of pipe material being tapped and with recessed flange for branch valve. Supply sleeve per applicable ACHD (if applicable) approved Tapping Plan details.
  - c. Tapping Valve: Cast-iron, non-rising-stem, resilient-seated gate valve with one end flanged with alignment lip to attach to tapping sleeve, other end connection to permit attachment of drilling machine and adapter. Valve shall meet ANSI/AWWA C500 and C509.

### B. Valve Boxes: Comply with AASHTO M306-07 for cast-iron valve boxes. Include top section, adjustable extension of length required for depth of burial of valve, cover with lettering "WATER," and bottom section with base that fits over valve and with a seven (7")-inch diameter shaft.

1. Operating Wrenches: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut.
2. Medium extension gate valve box shall be Bingham & Taylor No. 5001 (or approved equal).

## 2.5 CURB VALVES

### A. Manufacturers:

1. Manufacturers: Comply with AWWA C800 subject to compliance with MTJA requirements. Provide products by one of the following:
  - a. Ford Meter Box Company, Inc.
  - b. Mueller Co.; Water Products Div.
  - c. Approved equal.

### B. Service Boxes for Curb Valves: Similar to AWWA M44 requirements for cast-iron valve boxes. Include cast-iron telescoping top section of length required for depth of burial of valve, cover with lettering "WATER," and bottom section with base that fits over curb valve with a barrel approximately three (3")-inches in diameter.

1. Shutoff Rods: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and slotted end matching curb valve.
2. Three (3") inch curb service box to be Bingham & Taylor Buffalo Style (3" Old Style) No. 4939 or approved equal.

## PART 3 - EXECUTION

## 3.1 PIPING APPLICATIONS

- A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications. Confirm piping material for sizing and pressure ratings with Engineer, PAWC and ACHD (if applicable) prior to ordering material.
- B. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used, unless otherwise indicated.
- C. Do not use flanges or unions for underground piping.
- D. Flanges, unions, grooved-end-pipe couplings, and special fittings may be used, instead of joints indicated, on aboveground piping and piping in vaults.
- E. Underground water-service piping NPS 3 or less shall be one of the following:
  - 1. SDR 26
  - 2. PEX A
- F. Underground water-service piping NPS 4 to NPS 8 shall be the following:
  - 1. Class 52 Ductile Iron push on joint with Field Lok gaskets.
- G. Vault water-service piping NPS 4 to NPS 8 (DN 100 to DN 200) shall be the following:
  - 1. Ductile-iron, flanged-end pipe and joints.

## 3.2 VALVE APPLICATIONS

- A. General Application: Use mechanical-joint-end valves for NPS 3 (DN 80) and larger underground installation. Use threaded- or flanged-end valves for installation in vaults. Use corporation valves and curb valves with ends compatible with piping, for NPS 2 (DN 50) and smaller installation.
- B. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
  - 1. Underground Valves, NPS 3 (DN 80) and Larger: AWWA, cast-iron, non-rising stem, resilient-seated gate valves with valve box.
  - 2. Use the following for valves in vaults and aboveground:
    - a. Gate Valves, NPS 3 (DN 80) and Larger: AWWA, cast iron, OS&Y rising stem, resilient seated.

### 3.3 PIPING INSTALLATION

- A. Water Main Connection: Tap water main in accordance with Facility Owner and Owner requirements. Contact Facility Owner at least seventy-two (72) hours in advance to tap main and operate valves as required.
- B. Make connections larger than NPS 2 (DN 50) with tapping machine according to the following:
  - 1. Install tapping sleeve and tapping valve according to MSS SP-60.
  - 2. Install tapping sleeve on the pipe to be tapped. Position flanged outlet for gate valve.
  - 3. Use tapping machine compatible with valve and tapping sleeve; cut hole in main. Remove the tapping machine and connect water-service piping.
  - 4. Install gate valve onto tapping sleeve. Comply with MSS SP-60. Install valve with stem pointing up and with valve box.
  - 5. Confirm materials and procedure with Owner, Engineer and/or ACHD (if applicable) prior to ordering materials and beginning work.
- C. Make connections NPS 2 (DN 50) and smaller with drilling machine according to the following:
  - 1. Install service-saddle assemblies and corporation valves in size, quantity, and arrangement required by utility company standards.
  - 2. Install service-saddle assemblies on water-service pipe to be tapped. Position outlets for corporation valves.
  - 3. Use a drilling machine compatible with service-saddle assemblies and corporation valves. Drill hole in main. Remove the drilling machine and connect water-service piping.
  - 4. Install corporation valves into service-saddle assemblies.
  - 5. Install manifold for multiple taps in water main.
  - 6. Install curb valve in water-service piping with head pointing up and with service box.
  - 7. Confirm materials and procedure with Owner, Engineer, and/or ACHD (if applicable) prior to ordering materials and beginning work.
- D. Bury piping with depth of cover over top at least forty-eight (48")-inches.
- E. Extend water-service piping and connect to water-supply source and building-water-piping systems at outside face of building wall in locations and pipe sizes indicated.
  - 1. Terminate water-service piping at building wall until building-water-piping systems are installed. Terminate piping with caps, plugs, or flanges as required for piping material. Make connections to building-water-piping systems when those systems are installed.
- F. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.
- G. All service lines must be inspected in the open trench by Engineer, PAWC and ACHD (if applicable) personnel. Coordinate required inspections with Owner, Engineer, PAWC and/or ACHD (if applicable) as necessary. Pictures or videos of installed service lines are not acceptable.
- H. Surplus Excavated Material: Surplus material created by placement of pipe and aggregate bedding and/or aggregate backfill in the trench shall become the Contractor's property and be removed from the site at no additional cost to the Owner.

### 3.4 JOINT CONSTRUCTION

- A. Make pipe joints according to the following:
  - 1. Ductile-Iron Piping, Gasketed Joints for Water-Service Piping: AWWA C600 and AWWA M41.

### 3.5 ANCHORAGE INSTALLATION

- A. Anchorage, General: Install water-distribution piping with restrained joints. Anchorages and restrained-joint types that may be used include the following:
  - 1. Concrete thrust blocks and supports.
  - 2. EBAA megalugs.
  - 3. Field-Lok gaskets.
- B. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

### 3.6 VALVE INSTALLATION

- A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box.

### 3.7 FIELD QUALITY CONTROL

- A. Piping Tests: Conduct piping tests before joints are covered and after concrete thrust blocks have hardened sufficiently. Fill pipeline twenty-four (24) hours before testing and apply test pressure to stabilize system. Use only potable water.
- B. Hydrostatic Tests: All new water and fire service mains shall be tested hydraulically at not less than two hundred (200) psi pressure for not less than two (2) hours or fifty (50) psi in excess of the maximum static pressure when the maximum static pressure is in excess of one hundred fifty (150) psi. Contact Engineer for alternate test requirements prior to beginning testing. All tests must be witnessed by the Owner, Engineer, PAWC and/or ACHD (if applicable) Representative.
- C. Prepare reports of testing activities. Submit to Owner, Engineer, PAWC and/or ACHD (if applicable).

### 3.8 IDENTIFICATION

- A. Install continuous underground detectable warning tape during backfilling of trench for underground water-distribution piping. Locate below finished grade, directly over piping.



## 3.9 CLEANING

- A. Clean and disinfect water distribution piping as follows:
1. Purge new water distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
  2. Use purging and disinfecting procedure prescribed by PAWC and/or ACHD (if applicable) or, if method is not prescribed by authorities having legal control, use procedure described in NFPA 24 for flushing of piping. Flush piping system with clean, potable water until dirty water does not appear at points of outlet.
  3. Use purging and disinfecting procedure prescribed by PAWC and/or ACHD (if applicable) or, if method is not prescribed by authorities having legal control, use procedure described in AWWA C651 or as follows:
    - a. Fill system or part of system with water/chlorine solution containing at least fifty (50) ppm of chlorine; isolate and allow to stand for twenty-four (24) hours.
    - b. Drain system or part of system of previous solution and refill with water/chlorine solution containing at least two hundred (200) ppm of chlorine; isolate and allow to stand for three (3) hours.
    - c. After standing time, flush the system with clean, potable water until no chlorine remains in water coming from system.
    - d. Submit water samples in sterile bottles to authorities having legal control. Repeat procedure if biological examination shows evidence of contamination.
- B. Prepare reports of purging and disinfecting activities. Submit to Owner, Engineer, PAWC, and ACHD (if applicable).

END OF SECTION 02510

## SECTION 02530 - SANITARY SEWERAGE

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings, Approved Permits, 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 gravity flow sanitary sewerage, with the following items:
  - 1. Pipe: Type; Delivery, Storage and Handling; Installation; Cleaning and Testing.
  - 2. Manholes: Components; Installation; Cleaning; and Testing.
  - 3. Correction of Defective Work.
  - 4. Final Inspection and Maintenance Bond CCTV Inspection(s).
- B. Related Sections include the following:
  - 1. Division 2 Section "Trench Excavation and Backfill for Sewers and Utilities" for all trench preparation, excavation, and backfilling.
  - 2. Division 2 Section "Site Restoration" for restoration of areas in lawns and other non-paved areas.

## 1.3 DEFINITIONS

- A. PVC: Polyvinyl chloride plastic.
- B. RCP: Reinforced concrete pipe.
- C. DIP: Ductile iron pipe.
- D. VCP: Vitrified clay pipe.
- E. HDPE: High Density Polyethylene Pipe.

## 1.4 SUBMITTALS

- A. Product Data: For the following:
  - 1. Cleanouts
  - 2. Sewer vents
  - 3. Pipes, wyes, couplings, and fittings
  - 4. Site tees
- B. Shop Drawings: Four (4) copies of the following shall be submitted for approval:
  - 1. Manholes: Concrete design mix, 28-day concrete compressive strength, details for connection of components, frame and casting designations and cover designations.
  - 2. Pre-cast concrete manholes along with the design certification from the manufacturer that the structure will support the design load.
  - 3. Frame and Casting: The manufacturer's data sheet on the style and type to be installed.
  - 4. Pipe and Fittings.
- C. Field quality testing reports.
  - 1. The following testing reports shall be provided to the Owner and/or Engineer concurrent with the most current Application for Payment:
    - a. Manhole: vacuum test reports
    - b. Sewer Main: deflection test reports
    - c. Sewer Main: leakage (air) test reports
    - d. Sewer Main: CCTV video and reports
    - e. Backfill: compaction test reports

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. PVC plastic pipe and fittings shall be stored on flat surfaces so that the barrels are evenly supported. The pipe shall be protected from direct sunlight by covering it with an opaque cover. The pipe shall not be stored piled higher than four (4') feet in height.
- B. Protect pipe, fittings and seals from dirt and damage. All damaged pipe, fittings, and seals, determined to be unacceptable for installation by the Engineer's Representative shall be removed from the site and replaced at the Contractor's sole expense.
- C. All bricks, manhole frames, manhole covers, and pre-cast manholes shall be protected from impact and free fall by using equipment of sufficient capacity for handling throughout the project.
- D. Any pipe, fittings, seals, pre-cast manholes, manhole frames, manhole covers, or bricks damaged or disturbed through any cause prior to acceptance of the work shall be repaired, realigned, or replaced at the Contractor's sole expense.

## 1.6 PROJECT CONDITIONS

- A. Interruption of Existing Sanitary Sewerage Service:
  - 1. Notify all parties involved with the project at least three (3) days in advance of the proposed interruption of service.
  - 2. Do not proceed with the interruption of service without the Owner's, the Engineer's, and the Facility Owner's written permission.
- B. Project Site Information (if applicable): A Geotechnical Engineering Investigation Report and/or Boring Logs have been prepared for this Project and is intended for Engineer design purposes only and is made available to Bidders only that they may have access to identical subsurface information available to the Owner. It is presented in good faith and is not intended as a substitute for the personal investigations, interpretations, or judgements of the Contractor. The Owner and/or Engineer expressly deny all responsibility for interpretations drawn from or judgements made on this data.
  - 1. The Contractor shall be allowed to make additional test borings and conduct reasonable exploratory operations necessary for bulk excavation and utility installations upon written request to the Owner within time frames referenced elsewhere in these Specifications.
- C. The Geotechnical Engineering Investigation Report and/or Boring Logs are referenced elsewhere in these Specifications (if applicable).

## PART 2 - PRODUCTS

## 2.1 PVC PIPE AND FITTINGS

- A. 15" (or smaller) Diameter Sewer Pipe, Wyes and Fittings: ASTM D-3034 for SDR 35 or SDR 26 as shown on the Plans with bell-and-spigot ends with gasket joints meeting or exceeding ASTM D 3312 for joint tightness and ASTM F477 for gasket material.
- B. 18" (or larger) Diameter Sewer Pipe, Wyes and Fittings: ASTM F-679 for minimum stiffness 46 or 115 as shown on the Plans with bell-and-spigot ends with gasket joints meeting or exceeding ASTM D 3312 for joint tightness and ASTM F477 for gasket material.
- C. PVC Fittings and Wyes: The Contractor shall provide manufactured fittings in all areas where fittings are required. All fittings and accessories shall be manufactured and furnished by the pipe supplier and have bell and/or spigot configurations compatible with that of the pipe. Fittings shall be manufactured in accordance with ASTM D-3034, ASTM F-1336 and CSA B182.2. Gaskets shall be manufactured in accordance with ASTM F477 or ASTM F913.

## 2.2 NON-PRESSURE PIPE COUPLINGS

- A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground non-pressure piping. Include ends of same sizes as piping to be joined and corrosion-resistant-metal tension band and tightening mechanism on each end.
- B. Sleeve Materials:
  - 1. For Concrete Pipes: ASTM C 443, rubber.
  - 2. Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
  - 3. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
  - 4. Shielded Flexible Couplings: Elastomeric sleeve with 300 series stainless steel shield and 316 stainless steel clamp band with two (2) nut and bolt take-up points per band. The couplings shall be manufactured by Fernco Inc. (Strong Back RC 5000 series) or an approved equal).

## 2.3 PRESSURE-TYPE PIPE COUPLINGS

- A. Reducing or transition, metal, bolted, sleeve-type, reducing or transition coupling, for joining underground pressure piping. Include 150-psig minimum pressure rating and ends of same sizes as piping to be joined.
- B. Tubular-Sleeve Couplings: AWWA C 219, with center sleeve, gaskets, end rings, and bolt fasteners.
  - 1. Center-Sleeve Material: Stainless steel
  - 2. Gasket Material: Natural or synthetic rubber.
  - 3. Metal Component Finish: Corrosion-resistant coating or material.
- C. Split-Sleeve Couplings: With split sleeve with sealing pad and closure plates, O-ring gaskets, and bolt fasteners.
  - 1. Sleeve Material: Stainless steel
  - 2. Sleeve Dimensions: Of thickness and width required to provide pressure rating.
  - 3. Gasket Material: O-rings made of EPDM rubber, unless otherwise indicated.
  - 4. Metal Component Finish: Corrosion-resistant coating or material.

## 2.4 CLEANOUTS

- A. PVC Cleanouts: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

## 2.5 PVC SIGHT TEES

- A. PVC Sight Tees, 15" Diameter and Smaller: ASTM D 3034 for SDR 26 and SDR 35 with bell-and-spigot ends with gasket joints meeting or exceeding ASTM D 3312 for joint tightness and ASTM F477 for gasket material.

## 2.6 MANHOLES

- A. Standard Pre-cast Concrete Manholes: ASTM C 478, pre-cast reinforced concrete, of depth indicated, with provision for sealant joints. The concrete shall have a minimum compressive strength of 4,000 PSI.
1. Inside Diameter: Forty-eight (48") inches, sixty (60") inches or as shown on the Plans.
  2. Ballast and Base Section: As shown on the Detail. The base, ballast and floor sections shall be monolithically poured in accordance with ASTM C 478. All bases shall be "extended".
  3. Joints: Shall be tongue and groove type should be formed in such a manner so that the joint sealant material can be applied evenly.
  4. Channels and Benches: Channels and benches shall be poured on site after the manhole and pipe have been installed. Pre-poured channels and benches may be used after written approval by the Owner and/or Engineer.
  5. Riser Sections: Five (5")-inch thickness for forty-eight (48") I.D. manholes and six (6")-inch minimum thickness for sixty (60") I.D. manholes with lengths varying to obtain proper depth. Submit riser section cut sheets for other inside diameter manholes as required. Do not order material without an approved submittal.
  6. Cone Section: As shown on the Detail.
  7. Joint Sealant: ASTM C 990, butyl rubber. Two (2) strips per joint.
  8. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection. Influent and effluent holes shall be spaced to allow for a minimum of two (2")-inch fall across the invert.
  9. Steps: Space as shown on the Detail. Provide fourteen (14")-inch tread width step made of impact resistant co-polymer polypropylene plastic molded around 1/2" diameter Grade 60 reinforcing steel. All steps shall meet the requirements of ASTM C 478 and AASHTO M 199. The polypropylene shall conform to ASTM D 4101. The reinforcing bar shall conform to ASTM A 615.
  10. Grade Rings: Reinforced-concrete rings up to twelve (12") inches in height. The grade rings shall match the diameter and thickness of the manhole frame and cover. All grade rings shall be designed with anchor bolts matching the location of the holes in the frame. All grade rings shall be securely anchored to the cone using all-thread with bolts or other approved anchoring material.
  11. Protective Coating: Plant-applied, SSPC-Paint 16, coal-tar, epoxy-polyamide paint ten (10)-mil minimum dry thickness factory applied to exterior surfaces.
  12. Manhole Frames and Covers: 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. All frames, covers and seal plates shall be Neenah Foundry Company Pattern No R-1753-A or approved equal. All frames shall be anchored to the cone using four (4) bolts with matching nuts.
  13. Identification: All structures shall have the identification number and manufacturer's name stamped on each section.
  14. Sewer Brick for Adjustments: All sewer brick shall meet the specifications set forth in the latest revision of AASHTO Designation M-91, Grade SS
  15. Flat tops will not be permitted unless approved in writing by the Owner and/or Engineer.

## 2.7 CONCRETE

- A. General: Cast-in-place concrete according to ACI 318 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: 4,000 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, 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. Manhole Channels and Benches: Field-poured or factory installed after written approval by Owner and/or Engineer. Portland cement design mix, 4,000 psi minimum, with 0.45 maximum water/cementitious materials ratio.
  - 1. Channels: Pour channel formed to same width as connected piping with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius with minimum fall of two (2")-inches between inflow and outflow openings.
  - 2. Benches: Slope to drain into channel at a minimum of four (4%)-percent.
- D. Ballast, Pipe Supports and Encasement: Portland cement design mix, 4,000 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, 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.

## 2.8 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 potable water.
- 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 re-tempered and none shall be used more the 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.

## PART 3 - EXECUTION

### 3.1 PIPING APPLICATIONS

- A. Gravity-Flow, Non-pressure Sewer Piping: Use the following pipe materials for each size range:
1. As indicated on the Plans.

### 3.2 PIPING INSTALLATION

- A. General Locations and Arrangements: Plans indicate general location and arrangement of underground sanitary sewerage piping.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. All pipe shall be laid upgrade with the bell end of the pipe upgrade. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements. The Contractor shall use laser beam equipment to control the grade of the trench bottom as well as pipe grade.
- C. Install manholes for changes in direction and slope and at locations indicated on the Plans.
- D. Install manufactured service connection at the location of each lot or building to be serviced with the sewer main.



- E. Install gravity-flow, non-pressure, drainage piping according to the following:
  - 1. Install piping with a minimum cover of three (3') feet unless otherwise indicated.
  - 2. Install piping below frost line.
  - 3. Install ductile-iron, gravity sewer piping according to ASTM A 746.
  - 4. Install ductile-iron and special fittings according to AWWA C600 or AWWA M41
  - 5. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.
- F. Clear interior of piping and manholes 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.
- G. Each length of pipe shall be laid with firm, full and even bearing throughout its entire length. Every length of pipe shall be inspected and cleaned of all dirt and debris before being laid. The interior of the pipe and the jointing seal shall be free from sand, dirt and trash before installing the next pipe section in the line. Extreme care must be taken to keep the bells of the pipe free from dirt and rocks so that joints may be properly assembled without over-stressing the bells. No pipe is to be trimmed or chipped to fit.
- H. No length of pipe shall be laid until the preceding lengths of pipe have been thoroughly embedded in place, to prevent movement or disturbance of the pipe.
- I. All pipe entering structures shall be cut flush with the inside face of the structure, and the cut ends of the pipe 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.
- J. The Contractor shall protect the installation at all times during construction. Movement of construction equipment, vehicles and loads over and adjacent to any pipe shall be performed at the Contractor's risk. All open ends of pipes shall be closed by approved temporary watertight plugs when pipe is not being installed. 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 shall make all required connections of the proposed sanitary sewer into existing sanitary sewer facilities, where and as shown on the Plans or in accordance with the recommendations of the Engineer.
- L. The work shall include the installation of any service lateral connections into the new sewer pipe in the locations shown in this specification or as ordered by the Engineer. The new PVC service connection shall be replaced with the same diameter of pipe and service wye which was removed.
- M. All removed sewer pipes, wyes, structures, and excess material shall be disposed of at an Owner-approved, fully permitted off site facility at no additional cost to the Owner.

- N. All joints are to be made watertight in accordance with the requirements specified herein. Pipe shall be joined in strict accordance with the pipe manufacturer's instructions. Rubber connection collars with stainless steel clamps (Fernco shielded RC 5000 series couplings) must be used to connect the existing pipe to the new pipe. Jointing of all pipes shall be done entirely in the trench. The interior of the pipe and the jointing seal shall be free from sand, dirt and trash before installing the next pipe section in the line.
- O. Aggregate bedding shall be a minimum depth of six (6") inches below all pipes extending to twelve (12") inches above the pipe crown with an approved AASHTO No. 57 limestone.
- P. All installations under pavement and within four (4') feet of any structure, curb or other improved surface shall be backfilled from one (1') foot above the pipe to the pavement subgrade with an approved PennDOT 2A limestone.
- Q. All installations outside of pavement or not within four (4') feet of any structure or curb shall be backfilled from one (1') foot above the pipe to six (6") inches below final grade with select on-site material (selected material is defined as finely divided material free of debris, organic material and stones) compacted in maximum ten (10")-inch lifts mechanically compacted to ninety-five (95%)-percent modified Proctor density per ASTM D1557. The final six (6") inch lift shall be completed in accordance with the Site Restoration Section of these Specifications.
- R. The Contractor shall keep records of all wye distances from upstream and downstream manholes and provide such information as part of the required as-built documentation.
- S. It should be noted that existing sanitary sewers are in use and that flow must be maintained. Sanitary bypass shall be made by plugging an existing upstream manhole and pumping the sewage into a downstream manhole and/or adjacent system for such periods so as not to create a danger of flooding and/or overflow. The pump(s), suction and discharge lines shall be sized solely by the Contractor to transport all flows without backup and/or release from the existing system. A back-up pump of the same size as the primary pump shall be on-site at all times during bypass operations. Compliance with these by-pass pumping requirements shall be included with the Bid Item considered most appropriate by the Contractor. No additional compensation will be considered by the Owner for by-pass pumping.
- T. The Contractor shall remove all plugs and/or pumps prior to leaving the project site after each workday and restore flow to the existing sewers using temporary watertight piping. The Contractor shall provide all necessary labor, equipment, and material at no additional cost to the Owner in the event overnight or twenty-four (24) hour pumping is required.
- U. Under no circumstances will dumping of raw sewage on public or private property be allowed.
- V. The Contractor shall remove, by pumping or other means, any surface or groundwater which may accumulate in trench excavations, and he shall at all times keep trench excavations free from water while work is being performed in them. Water from excavations shall be disposed of in such a manner as will not cause injury or damage to the public health, public or private property, nearby streams or rivers, the work contemplated or in progress, surfaces of the streets, nor cause any interference with the use of the same. The disposal of this water shall be performed in a manner satisfactory to the Engineer and authorities having jurisdiction. Drainage of water by way of the section of pipe under construction will not be permitted.

- W. All excess surplus material resulting from the placement of pipe and aggregate bedding and backfill shall become the Contractor's property and removed from the site at no additional cost to the Owner.

### 3.3 PIPE JOINT CONSTRUCTION

- A. Join gravity-flow, non-pressure, drainage piping according to the following:
1. Join ductile-iron, gravity sewer piping according to AWWA C600 for push-on joints.
  2. Join ductile-iron and special fittings according to AWWA C600 or AWWA M41.
  3. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasket joints.
  4. Join non-reinforced-concrete sewer piping according to ASTM C 14 and ACPA's "Concrete Pipe Installation Manual" for rubber-gasket joints.
  5. Join reinforced-concrete sewer piping according to ACPA's "Concrete Pipe Installation Manual" for rubber-gasket joints.
  6. Join dissimilar pipe materials with non-pressure-type, flexible couplings.

### 3.4 TRENCH EXCAVATION AND BACKFILL

- A. Refer to Division 2, Section 02310 "Trench Excavation and Backfill for Sewers and Utilities" for the following:
1. Trench excavation
  2. Aggregate pipe bedding
  3. Aggregate and native trench backfill material and conditions for use.
- B. Surplus Excavated Material: Surplus material created by placement of pipe and aggregate bedding and/or aggregate backfill in the excavated trench shall become the Contractor's property and be removed from the site at no additional cost to the Owner.

### 3.5 CONNECTION INTO EXISTING MANHOLE

- A. The Contractor shall be responsible providing a watertight connection between the pipe and the existing sanitary sewer manhole using an approved connection placed in a suitably sized field cored hole. No other method of connection will be allowed.

## 3.6 TESTING

- A. The Contractor shall test the completed sewers, including manholes, for leakage and deflection as specified herein in the presence of the Owner and/or Engineer after completion of final backfill. The Contractor shall notify the Engineer at least forty-eight (48)-hours in advance of any testing to have a representative of the Owner or Engineer present to witness testing. Testing not conducted in the presence of the Owner and/or Engineer will be considered as invalid.
- B. All sewer lines and manholes shall be thoroughly flushed and cleaned prior to testing. Do not allow contaminated water to drain into the existing system.
- C. New sewer lines shall be subject to the following low-pressure air test:
  - 1. Air Testing – All gravity sewers shall be subject to a low-pressure air test. The Contractor shall furnish all necessary labor, equipment, and materials to perform the test.
    - a. After flushing has been completed, the Contractor shall place mechanical or pneumatic plugs designed to resist internal testing pressures without the aid of bracing or blocking in the line at each manhole. However, the Contractor shall internally restrain or externally brace the plugs to the manhole wall as an added safety precaution throughout the test.
    - b. All air used shall pass through a single, above ground control panel. The above ground air control equipment shall include a shut-off valve, pressure regulating valve, pressure relief valve, input pressure gauge and a continuous monitoring pressure gauge having a pressure range from zero (0) to at least ten (10) psi. The continuous monitoring gauge shall be no less than four (4)-inches in diameter with minimum divisions of 0.10 psi and an accuracy of +/- 0.04 psi. Two separate hoses shall be used to: (1) connect the control panel to the sealed line for introducing low-pressure air, and (2) a separate hose connection for constant monitoring of air pressure build-up in the line. If pneumatic plugs are used, a separate hose shall also be required to inflate the pneumatic plugs from the above ground control panel.
    - c. All service laterals, stubs and fittings shall be properly capped or plugged. All gasketed caps, plugs or short pipe lengths shall be restrained using bracing stakes, clamps, tie-rods or wire harnesses over the pipe bells as required.
    - d. Low pressure air shall be slowly introduced into the sealed line until the internal air pressure reaches 4.0 psig greater than the average back pressure of any groundwater above the pipe, but not greater than 9.0 psig. If groundwater is known to exist or is anticipated above the sewer line to be tested, the Contractor shall apply Section 8 from the Uni-Bell PVC Pipe Association's "Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe" (most current edition) prior to continuing testing.
    - e. After a constant pressure of 4.0 psig (greater than the average groundwater back pressure) is reached, the air supply shall be throttled to maintain that internal pressure for at least two (2) minutes to allow the temperature of the entering air to equalize with the temperature of the pipe wall.

- f. When temperatures have been equalized and the pressure stabilized at 4.0 psig (greater than the average groundwater back pressure), the air hose from the control panel to the air supply shall be shut off or disconnected. The continuous monitoring pressure gauge shall then be observed while the pressure is decreased to no less than 3.5 psig (greater than the average back pressure of any groundwater over the pipe. At a reading of 3.5 psig, or any convenient observed pressure reading between 3.5 psig and 4.0 psig (greater than the average groundwater back pressure), timing shall commence with a stopwatch or other timing device that is at least ninety-nine (99%) percent accurate.
- g. If the time shown in the Table below for the designated pipe size and length elapses before the air pressure drops 0.5 psig, the section undergoing testing shall be designated as "pass" on an approved Air Test Data Sheet.

| Pipe Diameter<br>(Inches) | Minimum Time<br>(Min and Sec) | Length for Min<br>Time | Time for Longer<br>Lengths (Sec) |
|---------------------------|-------------------------------|------------------------|----------------------------------|
| 4                         | 1:53                          | 597                    | .190 L                           |
| 6                         | 2:50                          | 398                    | .427 L                           |
| 8                         | 3:47                          | 298                    | .760 L                           |
| 10                        | 4:43                          | 239                    | 1.187 L                          |
| 12                        | 5:40                          | 199                    | 1.709 L                          |
| 15                        | 7:05                          | 159                    | 2.671 L                          |
| 18                        | 8:30                          | 133                    | 3.846 L                          |
| 21                        | 9:55                          | 114                    | 5.235 L                          |
| 24                        | 11:20                         | 99                     | 6.837 L                          |
| 27                        | 12:45                         | 88                     | 8.653 L                          |
| 30                        | 14:10                         | 80                     | 10.683 L                         |
| 33                        | 15:35                         | 72                     | 12.926 L                         |
| 36                        | 17:00                         | 66                     | 15.384 L                         |
| 42                        | 19:54                         | 57                     | 20.942 L                         |
| 48                        | 22:47                         | 50                     | 27.352 L                         |
| 54                        | 25:31                         | 44                     | 34.618 L                         |
| 60                        | 28:20                         | 40                     | 42.738 L                         |

Where L = Length of Pipe being tested

The test may be discontinued once the above prescribed time has elapsed even though the 0.5 psig drop has not occurred. If the tested section fails to meet these requirements, the Contractor shall determine at his sole cost and expense the source, or sources, of leakage, and repair or replace all defective materials and/or workmanship to the satisfaction of the Engineer. The extent and type of repair which may be allowed, as well as the results, shall be subject to the approval of the Engineer. The completed pipe installation shall then be re-tested and required to meet the requirements of the above procedure.

2. Deflection Test– After installation and final backfill, wait a minimum of thirty (30) days prior to performing deflection testing of newly installed sanitary sewers. Mandrel testing shall be performed by pulling an approved rigid mandrel with an outside diameter (O.D.) equal to ninety-five (95%) percent of the inside diameter (I.D.) of the pipe being tested through the sewer section undergoing testing. Repair or replace any section of sewer not passing the mandrel. Re-test repaired or replaced sewer sections. The Contractor shall provide a “proving ring” with each mandrel so that the Engineer’s Representative may field verify the accuracy of the given mandrel.
  
3. Manhole Vacuum Test – After completion of manhole construction, wall sealing, or rehabilitation, but prior to backfilling, test manholes for water tightness using vacuum testing procedures. Plug influent and effluent lines, including service lines, with suitably sized pneumatic or mechanical plugs. Ensure plugs are properly rated for pressures required for test. Follow manufacturers’ safety and installation recommendations. Place plugs a minimum of six (6’)-inches outside of manhole walls. Brace inverts to prevent lines from being dislodged if lines entering manhole have not been backfilled. Install vacuum tester head assembly at top access point of manhole and inflate sealing element per manufacturer’s instructions and safety precautions. Evacuate manhole with vacuum pump to ten (10’)-inches mercury (Hg), disconnect pump, and monitor vacuum for the time specified in the table below. If the drop in vacuum exceeds one (1’)-inch Hg over the specified time, locate leaks, complete repairs necessary to seal manhole and repeat test procedure until satisfactory results are obtained.

|                                                 | Test Time (Seconds) by Manhole Diameter (Inches) |            |            |
|-------------------------------------------------|--------------------------------------------------|------------|------------|
|                                                 |                                                  |            |            |
| <u>Manhole Depth<br/>(Feet)</u>                 | <u>48”</u>                                       | <u>60”</u> | <u>72”</u> |
| 4                                               | 10                                               | 13         | 16         |
| 8                                               | 20                                               | 26         | 32         |
| 12                                              | 30                                               | 39         | 48         |
| 16                                              | 40                                               | 52         | 64         |
| 20                                              | 50                                               | 65         | 80         |
| 24                                              | 60                                               | 78         | 96         |
| (T)                                             | 5.0                                              | 6.5        | 8.0        |
| • Add T times for each additional 2-foot depth. |                                                  |            |            |

4. Lamping – Lamping may be conducted at the Owner or Engineer’s direction. A flashlight or similar light source shall be projected into the end of each pipe entering a manhole. A visual observation shall be made from the next adjacent upstream or downstream manhole. The pipe shall not be deemed acceptable unless a full circle of light from the light source is visible from manhole to manhole.

**D. CORRECTION OF DEFECTIVE WORK**

1. All defects discovered by testing are to be repaired at the sole cost and expense of the Contractor to conform strictly to the Specifications.
2. Pipe defects requiring correction include, but are not limited to, the following:
  - a. Alignment: Less than full inside diameter of pipe is visible between structures.
  - b. Deflection: Flexible piping with deflection that prevents passage of properly sized "go no-go" mandrel of not less than five (5.0%) percent of pipe base inside diameter (I.D.).
  - c. Crushed, broken, cracked, or otherwise damaged piping.
  - d. Infiltration: Water leakage into piping.
  - e. Exfiltration: Water leakage from or around piping.
3. Replace defective piping using new materials and repeat inspections until defects are within allowances specified.
4. Re-inspect and repeat testing procedure(s) until results are satisfactory.

**3.7 CLEANING**

- A. The Contractor shall be required to clean all installed sanitary piping and structures of debris and obstructions. This shall include, but not be limited to, the removal of all formwork from structures; concrete and mortar droppings; and construction debris and dirt. The piping system shall be thoroughly flushed using hydraulically propelled sanitary sewer cleaning equipment. The Contractor shall furnish all necessary hoses, pumps, water, pipe, and other equipment that may be required to meet this requirement. No debris shall be allowed to enter the existing sanitary sewer system or passed from manhole to manhole.
- B. After the system has been cleaned, the Contractor shall thoroughly inspect the system and all repairs shown to be necessary shall be properly performed by the Contractor. All work of cleaning and repair as specified herein shall be performed at the Contractor's sole cost and expense.

## 3.8 FINAL INSPECTION AND MAINTENANCE BOND CCTV INSPECTION

- A. The entire installed sanitary sewer system shall be subject to final inspection in the presence of the Owner and/or Engineer upon completion of the work and before final acceptance. The work shall not be considered as complete until all requirements for line, grade, cleanliness, restoration and workmanship have been met. The Work shall not be accepted until all field quality test reports and as-built documentation have been submitted to the Engineer for review and final approval. In addition, the Contractor shall perform internal television inspection by closed circuit television (CCTV) of the gravity sewers included in this Contract as part of the final inspection and testing process before acceptance by the Owner. All sewers shall be cleaned prior to post-installation CCTV.
- B. The Contractor shall perform a warranty inspection of the gravity sewers included in this Contract approximately two (2) months (or at Engineer's discretion) prior to expiration of the Maintenance Bond. The warranty inspection shall involve the internal television inspection by closed circuit television (CCTV) of the gravity sewers included in this Contract. All sewers shall be cleaned prior to warranty CCTV. This inspection shall be submitted to the Engineer to determine if any warranty repair work is required. The cost for this item is incidental to the sanitary sewer installation costs. Any repair work discovered because of the warranty inspection shall be completed to the satisfaction of the Engineer at the Contractor's sole expense. The Maintenance Bond will not be released until all required repair work (including restoration) has been completed to the satisfaction of the Engineer.

END OF SECTION 02530



## SECTION 02531 – CCTV INSPECTIONS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

## 1.2 RELATED DOCUMENTS

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

## 1.3 SUMMARY

- 1. This Section includes the specifications for the internal inspection of existing or installed sewers including bypass pumping.
- B. Related Sections include the following:
  - 1. Division 1 Section “General Project Requirements” for all general requirements that apply to the Work to be completed.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

## 3.1 SPECIFICATIONS FOR INTERNAL TELEVISION INSPECTION

- A. Scope
  - 1. Provide all labor, materials, tools and equipment required to inspect via closed circuit television inspection and clean the sanitary and storm sewer segments listed on the bid schedule and/or as shown on the plans.
  - 2. Inspections shall be conducted by a National Association of Sewer Service Companies (NASSCO) certified operator. A current copy of the Operator's certification shall be made available to the Owner and/or Engineer for review prior to beginning work.

## B. Products

1. The television camera used for the inspections shall be one specifically designed and constructed for such inspections. Lighting for the camera shall be sufficient to provide a clear picture of the entire pipe periphery. The camera shall be operative in one hundred (100%) percent humidity conditions. The camera, television monitor, and other components of the video system shall be capable of producing picture quality to the satisfaction of the Owner's Representative; and if unsatisfactory, equipment shall be removed, and no payment shall be made for any unsatisfactory inspection.
2. Self-propelled robotic pan and tilt cameras shall be used for the entire project. If a robotic camera is not possible to be utilized due to site limitations or equipment failures, a winch, cable, or other device that does not obstruct the camera view or interfere with observation of the sewer conditions may be used. Push rod type cameras are not acceptable unless no other method is possible.
3. The television camera used for the inspection shall be one specifically designed and constructed for such inspection and shall be capable of meeting NASSCO performance requirements. The camera, television monitor and other components of the video system shall be capable of meeting NASSCO performance requirements and producing a minimum 500-line resolution video picture.
4. The software associated with the camera system shall be capable of documenting observed conditions in digital format and documenting defects using standardized Pipeline Assessment Certification Program (PACP) digital coding and rating system.
5. Final database file submittals shall be made in a format such that WinCan 7 is able to be used to review the videos and upload data to the Engineer's CCTV database. If other software is used, after approval, data must be exported by the CCTV Contractor prior to submittal to the Engineer's office for review. Formats that do not upload to the Engineer's CCTV database will not be accepted.

## C. Field Procedures During Internal Television Inspection

1. When the depth of flow at the upstream manhole of the sewer line section being worked on is above twenty (20%) percent of the diameter of the pipe, the flow shall be reduced to twenty (20%) percent of the pipe diameter by plugging or blocking of the flow, or by pumping and bypassing of the flow as specified. If the CCTV footage submitted exceeds the twenty (20%) percent maximum, the footage shall be considered incomplete and additional televising after adequate flow control measures are installed will be required to complete the segment. Payment for flow reduction shall be considered incidental to the appropriate CCTV bid item.
2. All inspections originating at a manhole/Inlet shall begin with the camera in the manhole and shall include a visual inspection of the manhole/inlet wall, bench area, and pipe entrance or exit into the manhole. The depth of the manhole/inlet shall be clearly noted.
3. The camera shall be moved through the line at a moderate rate, stopping when necessary to permit proper documentation of the sewer's condition. In no case will the camera be pulled at a speed greater than thirty (30') feet per minute.

### 3.2 SEWER LINE CLEANING

#### A. Scope

1. Sewer line cleaning shall remove foreign materials from the lines to allow for unrestricted passage of sewer televising equipment.

#### B. Products

1. All high-velocity sewer cleaning equipment shall be constructed for ease and safety of operation. The equipment shall have a selection of two or more high-velocity nozzles. The nozzles shall be capable of producing a scouring action from fifteen (15) to forty-five (45) degrees in all size lines designated to be cleaned. Equipment shall also include a high-velocity gun for washing and scouring manhole walls and floors. The gun shall be capable of producing flows from a fine spray to a solid stream. The equipment shall carry its own water tank, auxiliary engines, pumps, and hydraulically driven hose reel. The equipment shall also include a vacuum, vacuum hose and enclosed debris tank for appropriate disposal of waste material flushed from the sewer line.
2. Roots shall be removed where root intrusion is a problem. Special attention shall be used during the cleaning operation to ensure complete removal of roots from the joints. The use of robotic root cutting equipment may be used to complete this task.

#### C. Field Procedures during Cleaning of Sewers

1. Sewers to be CCTV inspected shall be cleaned immediately prior to the inspections unless the sewer line walls are sufficiently clean to allow an internal inspection by CCTV to detect structural defects, misalignment, and infiltration sources.
2. The sewer cleaning operations will be on an as required basis as determined by the Owner or their representative.
3. Light cleaning operations, to be defined as two passes with the hydraulically propelled cleaning tools, will be determined by the Engineer to meet the criteria of item 3.2.C.1. Light cleaning shall be considered incidental to the appropriate CCTV bid item.
4. Heavy cleaning will be defined as operations to remove all materials to meet the criteria of item 3.2.C.1 as determined by the Engineer beyond the definition of light cleaning operations. Such cleaning operations will be employed to remove roots, mineral deposits, sludge, grease, dirt, debris, or other obstructions, to ensure repair locating and post-CCTV sewer line work and are upon the Engineer's authorization only.
5. During sewer cleaning operations, satisfactory precautions shall be taken in the use of cleaning equipment. When hydraulically propelled cleaning tools, which depend upon water pressure to provide their cleaning force, or tools which retard the flow in the sewer line are used, precautions shall be taken to ensure that the water pressure created does not damage or cause flooding of public or private property being served by the sewer.

6. It shall be the Contractor's responsibility to provide all water for the hydrocleaning operation. If the Contractor wishes to use the local water company as a source of supply for water, he must first contact the water company to determine their permit requirements and/or required fees prior to placing his bid for the work.
7. The designated sewer sections shall be cleaned using hydraulically propelled, high velocity jet, or mechanically powered equipment. Selection of the equipment used shall be based on the conditions of lines at the time the work commences. The equipment and methods selected shall be satisfactory to the Owner's Representative. The equipment shall be capable of removing dirt, grease, rocks, sand, and other materials and obstructions from the sewer lines and manholes.
8. If the Contractor's equipment becomes lodged in the sewer, the Contractor shall notify the Engineer as soon as practicable, but no later than the end of the same workday. The Contractor shall take all steps necessary to safely remove the equipment in a timely manner without damaging the sewer, and without causing a sewer overflow. If the lodged equipment must be removed by excavation, the Contractor shall be responsible for following the Owner's standards for such excavations and repairs. All such retrieval operations shall be at the Contractor's sole expense.
9. All sludge, dirt, sand, rocks, grease and other solid or semisolid material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned. Passing materials from manhole section to manhole section, which could cause line blockages shall not be permitted.
10. All solids or semisolids resulting from the cleaning operations shall be removed from the site and disposed of at a site approved by the Owner. All materials shall be removed from the site no less often than at the end of each workday. Under no circumstances will the Contractor be allowed to accumulate debris, etc., on the work site beyond the stated time, except in totally enclosed containers and as approved by the Owner.
11. Acceptance of sewer line cleaning shall be made upon successful completion of the television inspection and shall be to the satisfaction of the Owner's Representative. If CCTV inspection shows the cleaning to be unsatisfactory, the Contractor shall be required to re-clean and re-inspect the line(s) at the expense of the Contractor.
12. Payment for light cleaning of the sewers shall be incidental to the payment for the CCTV inspections as required by the Contract.

## D. Bypass Pumping of Flow

## 1. Bypass Pumping

- a. When pumping and bypassing is required, the Contractor shall size and supply all pumps, conduits, and other equipment to divert the flow around the sewer segment in which work is to be performed. The Contractor will be responsible for furnishing the necessary labor, materials, equipment tools, and supervision to set up and operate the pumping and bypassing system. A stand-by pump of the same size as the primary pump must be on-site at all times.
- b. The bypass shall be made by diversion of the flow from the existing upstream access point and pumping the flow into a downstream access point in the sewer system or into an adjacent system. The bypass system shall be of sufficient capacity to handle all flow including existing flow and additional flow that may occur during a weather event. Sizing of the system shall be the sole responsibility of the Contractor. No additional payment will be considered for an up-sized system if the initial Contractor-furnished system proves inadequate.
- c. The Contractor shall remove the pumps and plugs from the site at the end of each day of work or otherwise provide adequate site protection.
- d. Any damage caused by the plugging and pumping shall be repaired or restored at the sole expense of the Contractor.

## 2. Plugging or Blocking

- a. A sewer line plug may be inserted into the line upstream of the section being worked on. The plug shall be so designed that all or any portion of the flow can be released. After the work has been completed, flow shall be restored to normal.
- b. When flow in a sewer line is plugged or blocked sufficient precautions must be taken to protect the sewer lines from damage that might result from sewer surcharging. Further, precautions must be taken to ensure that sewer flow control operations do not cause flooding or damage to public or private property being served by the sewers involved.
- c. The Contractor shall remove the blocks and plugs from the site at the end of each day of work.
- d. Payment for plugging, blocking and bypass shall be incidental to the lineal foot cost for internal television inspections, pipe repair and pipe installation.

END OF SECTION 02531

## SECTION 02620 - SUBDRAINAGE

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings, Approved Permits, 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, but is not limited to, sub-drainage systems for the following:
  - 1. Underslab areas.
  - 2. Underdrains and/or curb drains.
  - 3. Landscaped areas.

## 1.3 DEFINITIONS

- A. Sub-drainage: Drainage system that collects and removes subsurface or seepage water.

## 1.4 SUBMITTALS

- A. Product Data: For the following:
  - 1. Drainage conduits.
  - 2. Geotextile filter fabrics.

## 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 the "Piping Applications" Article in Part 3 for applications of pipe, tube, fitting, and joining materials.

## 2.3 SOIL MATERIALS

- A. Backfill, drainage course, impervious fill, and satisfactory soil materials are specified in Division 2 Section "Earthwork."

## 2.4 PERFORATED WALL PIPES AND FITTINGS

- A. Perforated PE Pipe and Fittings:
  - 1. NPS 6 (DN 150) and Smaller: ASTM F 405 or AASHTO M 252, Type CP; corrugated, for coupled joints.
  - 2. Couplings: Manufacturer's standard, band type.
- B. Perforated PVC Sewer Pipe and Fittings: ASTM D 2729, bell-and-spigot ends, for loose joints.

## 2.5 SUBBASE SEPARATION FABRIC

- A. Separation Geotextile: Shall comply with the requirements for Class 4, Type A geotextile in PennDOT Publication 408 (April 2020) Section 735. Fabric shall be listed on PennDOT Bulletin Number 15 (Qualified Products List for Construction).

## 2.6 SUBSURFACE DRAINAGE FABRIC

- A. Subsurface Drainage: Shall comply with the requirements for Class 1 geotextile in PennDOT Publication 408 (April 2020) Section 735. Fabric shall be listed on PennDOT Bulletin Number 15 (Qualified Products List for Construction).
  - 1. Structure: Woven monofilament
  - 2. Style(s): Flat or sock

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine surfaces and areas for suitable conditions where sub-drainage systems are to be installed.
- B. If sub-drainage is required for landscaping, locate and mark existing utilities, underground structures, and aboveground obstructions before beginning installation and avoid disruption and damage of services.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 EARTHWORK

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

### 3.3 PIPING APPLICATIONS

#### A. Underdrains / Curb Drains

1. Underdrains shall be installed on both sides of the roadway. All backfilling shall be approved AASHTO No. 57 limestone. Pipe shall be four (4")-inch perforated SLCPP pipe. Geotextile shall be PennDOT Class 1.

### 3.4 PIPING INSTALLATION

- A. Install piping beginning at low points of system, true to grades and alignment indicated, with unbroken continuity of invert. Bed piping with full bearing in filtering material. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions and other requirements indicated.
1. Install piping pitched down in direction of flow, at a minimum slope of one (1%) percent.
  2. Lay perforated pipe with perforations down.
  3. Excavate recesses in trench bottom for bell ends of pipe. Lay pipe with bells facing upslope and with spigot end entered fully into adjacent bell.
  4. All drainage piping must outlet into an existing storm structure or connects to existing drainage piping.
- B. Use increasers, reducers, and couplings made for varied sizes or materials of pipes and fittings being connected. Reduction of pipe size in direction of flow is prohibited.
- C. Install SLCPP piping according to ASTM D 2321.

### 3.5 IDENTIFICATION

- A. Materials and their installation are specified in other Sections of these Specifications. Install warning tapes directly over piping.
1. Install detectable warning tape over nonferrous piping and over edges of underground structures.

### 3.6 FIELD QUALITY CONTROL

- A. Testing: After installing drainage course to top of piping, test drain piping with water to ensure free flow before backfilling. Remove obstructions, replace damaged components, and repeat test until results are satisfactory.

### 3.7 CLEANING

- A. Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION 02620



## SECTION 02630 - STORM DRAINAGE

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings, Approved 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 storm drainage, including but not limited to, the following components:
  - 1. Drains and piping.
  - 2. Storm inlets and catch basins.

## 1.3 DEFINITIONS

- A. SLCPP: High-density polyethylene (HDPE) Pipe
- B. RCP: Reinforced Concrete Pipe
- C. CMP: Corrugated Metal Pipe

## 1.4 SUBMITTALS

- A. Product Data: For the following:
  - 1. Pipe and fittings.
  - 2. Manhole, outlet structure, catch basin and storm inlet frames, covers and/or grates.
  - 3. End walls
- B. Shop Drawings: Four (4) copies of the following shall be submitted for approval prior to ordering material:
  - 1. Storm Inlets: Concrete design mix, 4000 psi, 28-day compressive strength as well as the certification from the manufacturer that the structure will support the design load.
  - 2. Storm Manholes: See above for concrete requirements.
  - 3. Storm Sewer Frames and Grates
  - 4. All Manhole and Inlet submittals shall include sumps and transitions if required.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic pipe 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 the Owner, the Facility Owner, property owners, and the Engineer no fewer than three (3) days in advance of proposed interruption of service.
  - 2. Do not proceed with interruption of service without the Owner's and Facility Owner's written permission.
- B. Project Site Information (if applicable): A Geotechnical Engineering Investigation Report and/or Boring Logs have been prepared for this Project and is intended for Engineer design purposes only and is made available to Bidders only that they may have access to identical subsurface information available to the Owner. It is presented in good faith and is not intended as a substitute for the personal investigations, interpretations, or judgements of the Contractor. The Owner and/or Engineer expressly deny all responsibility for interpretations drawn from or judgements made on this data.
  - 1. The Contractor shall be allowed to make additional test borings and conduct reasonable exploratory operations necessary for bulk excavation and utility installations upon written request to the Owner within time frames referenced elsewhere in these Specifications.
- C. The Geotechnical Engineering Investigation Report and/or Boring Logs are referenced elsewhere in these Specifications (if applicable).

## 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 Installations" 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: 4,000 psi minimum, with 0.40 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. Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4,000 psi minimum, with 0.40 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 and/or inlet.
  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 re-tempered and none shall be used more the 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 STEPS

- A. Steps: Space as shown on the Detail. Provide fourteen (14")-inch tread width step made of impact resistant co-polymer polypropylene plastic molded around one-half (1/2")-inch diameter Grade 60 reinforcing steel. All steps shall meet the requirements of ASTM C 478 and AASHTO M 199. The polypropylene shall conform to ASTM D 4101. The reinforcing bar shall conform to ASTM A 615.

## 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 4,000 psi.
  1. Inside Diameter: As indicated on the Drawings. Final sizing shall be the responsibility of the Contractor. No additional compensation will be considered for "upsizing" any manhole or structure regardless of the "callout" shown.
  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. All bases shall be "extended".
  3. Joints: Shall be tongue and groove type should be formed in such a manner so that the joint sealant material can be applied evenly. A double strip of sealant is required at each joint.
  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: Five (5")-inch thickness for 48" I.D. manholes and six (6")-inch minimum thickness for 60" I.D. manholes with lengths varying to obtain proper depth. Submit riser section cut sheets for 72", 94" and 106" I.D. manholes as required.
  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 butyl rubber. Two (2) strips per joint.
  8. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection. Influent and effluent holes shall be cast as required to provide fall across the invert as listed elsewhere in this Section.
  9. Steps: Space as shown on the Detail. Provide fourteen (14")-inch tread width step made of impact resistant co-polymer polypropylene plastic molded around one-half (1/2")-inch diameter Grade 60 reinforcing steel. All steps shall meet the requirements of

ASTM C 478 and AASHTO M 199. The polypropylene shall conform to ASTM D 4101. The reinforcing bar shall conform to ASTM A 615.

10. Grade Rings: Reinforced-concrete rings up to twelve (12") inches in height, brick and mortar up to six (6") inches in height or steel rings six (6") inches to twelve (12") inches in height. The grade rings/brick shall match the diameter and thickness of the manhole frame and cover. All concrete/steel grade rings shall be designed with anchor bolts matching the location of the holes in the frame.
11. Manhole Frames and Covers: Install as shown on the Plan and/or 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. Frames shall be bolted to the cone using four (4) bolts.
12. Identification: All structures shall have the identification number and manufacturer's name stamped on each section.
13. Transitions: As required. Indicate location of each transition per individual structure on Submittal.
14. Snouts and Sumps: As indicated on the Plan per the Detail.
15. Plant Inspection: Provide PennDOT plant inspections as applicable at no additional cost to the Owner.

## 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: Six (6")-inch minimum thickness for integral floor slab and walls. Inlets shall be constructed as shown on the Detail.
2. Riser Sections: Six (6")-inch minimum thickness and heights to provide depth indicated.
3. Joint Sealant: ASTM C 990 butyl rubber.
4. Pipe Entrance Holes: Inlet boxes shall have properly sized cored or cast holes as required for proposed piping. 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. "Knockout" type inlet boxes will not be acceptable.
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 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.
9. Sizing: Provide inlets as indicated on the Drawings. The Contractor shall be responsible for final sizing. No additional compensation will be considered for "upsizing" any inlet.
10. Sumps and Snouts: Snouts and Sumps: As indicated on the Plan per the Detail.

11. Plant Inspection: Provide PennDOT plant inspection as applicable at no additional cost to the Owner.
- B. Inlets shall be constructed in accordance with the Detail shown on the Plans. Poured-in-place inlets may be used in lieu of pre-cast inlets at no additional charge to the Owner. The Contractor shall provide Submittals showing reinforcement for all poured-in-place inlets prior to construction.

### 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."
- B. Excavations for tanks and tanking will be considered as excavations subject to all requirements for pipe trenches regarding full depth aggregate backfill, i.e., tank excavations under pavement or within four (4')-feet of pavement will require full depth aggregate backfill placed to the bottom of the pavement section placed at no additional cost to the Owner.
- C. Surplus Excavated Material: Surplus material created by placement of pipe and aggregate bedding and/or aggregate backfill in the trench shall become the Contractor's property and be removed from the site at no additional cost to the Owner.

#### 3.2 PIPING INSTALLATION

- A. General Locations and Arrangements: Install all drainage structures and pipe in the locations shown on the Plans and/or as directed by the Owner and/or Engineer. Pipe shall be of the type and specified size 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 and pipe.
- 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. The installation of all drainage structures and pipe within the public rights-of-way and/or easements shall conform to the requirements of the agency having authority.
- E. 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.

- F. Pipe Installation, Extension or Repair: Install the same type and size of pipe unless otherwise directed by the Engineer. Connect existing to new as directed by the Engineer or according to manufacturer's recommendations.
- G. Install catch basins, storm inlets and/or drains at changes in direction and slope.
- H. Install manufactured service connections as required or directed.
- I. Tunneling: Install pipe under streets or other obstructions that cannot be disturbed by tunneling, jacking, or a combination of both.
- J. Install gravity-flow, non-pressure drainage piping according to the following:
  - 1. Install piping with a minimum cover of three (3') feet, unless otherwise indicated.
  - 2. Install polyethylene corrugated sewer piping according to CPPA's "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."
  - 3. Install reinforced concrete pipe according to ACPA Recommendations.
- K. 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.
- L. 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 endwalls, headwalls, end sections, etc.
- M. The Contractor shall 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. All open ends of pipes shall be closed by approved temporary watertight plugs during delays in pipe laying operations. 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.
- N. The Contractor will be required to adjust the line and grade of the new storm sewer to avoid conflicts with utility service lines as required at no additional cost to the Owner.
- O. The Contractor will be required to remove the existing storm sewer to install new storm sewer at no additional cost to the Owner.
- P. The pipe shall be laid on a six (6")-inch bed of approved AASHTO #57 limestone and backfilled in the pipe zone as listed elsewhere in these Specifications.
- Q. The storm sewer pipe shall be backfilled above the pipe zone as required per the applicable critical or non-critical trench requirements at no additional cost to the Owner.

- R. The Contractor shall excavate and locate all sewers and utilities that may exist so that adjustments may be made to the proposed storm sewers as necessary to avoid conflicts. The Owner and/or Engineer shall be notified immediately in the event of conflict.
- S. Pipe shall be ADS N-12 WT IB Pipe (or approved equal) in accordance with AASHTO M294 and shall be watertight according to the requirements of ASTM D 3212 (or as otherwise listed in the Contract Documents). Gaskets shall meet the requirements of ASTM F477. RCP shall be in accordance with ASTM C76 and C 443 with gaskets meeting class requirements listed elsewhere in these Specifications or as determined by the Engineer. CMP shall be 14-gauge, Type 2 aluminized steel pipe with hugger bands and gaskets. All pipe installed within PennDOT rights-of-way (if applicable) shall be listed on Bulletin 15 with certifications as required.

### 3.3 PIPE JOINT CONSTRUCTION

- A. Basic pipe joint construction shall follow the piping manufacturer's written instructions.
- B. Join gravity-flow, non-pressure drainage piping according to the following:
  - 1. Join SLCPP Storm Piping according to ADS, Inc. Drainage Handbook (or approved equal).
  - 2. Join RCP according to ACPA recommendations or manufacturer's instructions.
  - 3. Join CMP according to NCSPA recommendations or manufacturer's instructions.

### 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 Plans and Profiles. Install all storm drainage structures as shown on the Details.
- 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 shall be constructed when the pipe laying reaches the location of the structure. The Engineer shall have the authority to stop the pipe laying operations until the structure is completed if the Contractor continues pipe laying without placing structures.
- D. 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 sole 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. All storm drainage structures shall be constructed on foundations constructed of a minimum of approved six (6") depth AASHTO #57 limestone.
- G. Masonry: All brick or concrete block shall be thoroughly wetted before laying. 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 three-eighths (3/8") inch or more than one-half (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 ensure 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 Details. 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 structures shall be poured to provide positive drainage and continuous concrete channels. Structures with sumps will not be required to have inverts and/or benches.
- I. Frames, Covers and/or Grates: Frames, Covers and/or Grates storm drainage structure shall be of the type and size indicated on the Drawings. 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. Steps: Steps 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, unless otherwise specified by the Owner and/or Engineer.
- 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 all required sewer connection(s) from the existing pipe to the new inlet.
- N. Pre-cast storm drainage structures shall be installed only after Submittals have been approved by the Engineer. Poured-in-placed structures meeting all applicable Details may be used in lieu of pre-cast structures at no additional cost to the Owner. Provide Submittals showing the location of reinforcement for all poured-in-place structures prior to placement.
- O. The top grade of the pre-cast concrete manhole corbel 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. Pre-cast concrete grade rings may be used between the top section and the structure's frame to meet existing grades up to twelve (12") inches. All grade rings shall have holes to allow for the

casting to be connected to the last concrete section with three-quarter inch (3/4") diameter bolts. The holes around the bolts shall be grouted after installation with non-shrink grout.

- Q. Steps shall be installed during the casting of the structure and aligned in accordance with the Detail.
- R. Inlets and Manholes shall be constructed in accordance with the Detail shown on the Plans. 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 shall have a minimum wall and base thickness of eight (8") inches and will be reinforced with #4 rebar twelve (12")-inches center to center, both ways. All inlets over five (5') feet in depth, measured from the top of grate to downstream invert, shall have steps installed, per the Detail. Backfill around inlets shall be approved mechanically compacted PennDOT 2A limestone.
- S. Inlets shall have cast iron frames and castings as shown on the Detail.
- T. All inlets shall have a PennDOT approved bicycle safe grate or two-piece vane grate from a Bulletin 15 Supplier. All structures and piping within PennDOT rights-of-way shall be certified at no additional cost to the Owner.
- U. All manholes and inlets shall have concrete inverts poured to direct the flow of water and to aid in self-cleaning.
- V. Place cast-in-place concrete according to ACI 318/318R.

### 3.5 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 Drawings, including implementing modifications to the storm water management and erosion control facilities on the site.

### 3.6 CLEANING AND REPAIR

- A. 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. The Contractor shall furnish all necessary water, hoses, 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 gathered and promptly removed from the site. Payment for this requirement shall be incidental to the Bid Unit Price for pipe.

### 3.7 FINAL INSPECTION REQUIREMENTS

- A. The entire installed storm sewer system shall be subject to final inspection in the presence of the Owner and/or Engineer upon completion of the work and before final acceptance. The work shall not be considered as complete until all requirements for line, grade, cleanliness, restoration, and workmanship have been met. The Work shall not be accepted until all field

quality test reports and as-built documentation have been submitted to the Engineer for review and final approval. In addition, the Contractor shall perform internal television inspection by closed circuit television (CCTV) of the storm sewers included in this Contract as part of the final inspection and testing process before acceptance by the Owner. Review and acceptance by the Engineer of submitted CCTV documentation will determine the Final Acceptance date regardless of the date of actual completion of the work.

- B. The Contractor shall perform a second CCTV inspection prior to release of the Maintenance Bond. Acknowledgement of this requirement shall be included in the Final Payment documents. Payment to meet these requirements shall be considered as included in the Bid Unit Price for pipe.

END OF SECTION 02630

## SECTION 02741 – ASPHALT PAVING

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings, Approved Permits, 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. Asphalt paving
  - 2. Asphalt paving overlay.
  - 3. Cold milling of existing bituminous pavement
  - 4. Stone base
  - 5. Keyways

## 1.3 DEFINITIONS

- A. Bituminous Paving Terminology: Refer to ASTM D 8 for definitions of terms.
- B. Asphalt Paving: Bituminous paving or material.
- C. PennDOT: Pennsylvania Department of Transportation.

## 1.4 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 for 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 is leaving the plant, the type of material, the net weight of material in the truck and a 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.

- B. Qualification Data: PennDOT Pre-qualification Certifications from all Contractors and Suppliers meeting the appropriate classifications for the project and a minimum of three (3) 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.

#### 1.5 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 PennDOT Publication 408 (most current edition) Section 735.
- B. The temperature of the warm-mix asphalt (WMA) shall meet the requirements of PennDOT Publication 408 (April 2020 edition) Section 413 Table A.

#### 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply bituminous materials, geotextiles, or paving fabrics unless the following requirements are met:
  - 1. The subgrade, subbase or existing bituminous material is dry as determined by the Owner's representative.
  - 2. The existing pavement has been conditioned in accordance with Section 413 of PennDOT Publication 408 (April 2020 edition).
  - 3. Tack Coat: Minimum air and surface temperature of forty (40) degrees Fahrenheit and rising in accordance with Section 460 in the current edition of PennDOT Publication 408
  - 4. Superpave Bituminous Base, Binder and Wearing Surface: Minimum surface and air temperature of forty (40) degrees Fahrenheit and rising at time of placement in accordance with Section 413 of PennDOT Publication 408 (April 2020 edition). Do not install between November 1 to March 31 unless an extension of the paving season is granted in writing by the PennDOT District Executive following all requirements of PennDOT Publication 408 (April 2020) for extended season paving or the Owner (for municipal roads).

## PART 2 - PRODUCTS

## 2.1 AGGREGATES

- A. General Requirements: Provide aggregates from sources listed in Bulletin 14. Aggregate and RAM shall conform to the quality requirements for Superpave Asphalt Mixture Design as specified in Bulletin 27. For wearing courses, provide aggregate with at least the SRL designation specified. To achieve a specified SRL, the Contractor may provide a blend of two aggregates if the blend has an SRL designation equal to or better than that specified. Blends are fifty (50%) percent by mass (weight) of each aggregate. Blend the aggregates using an approved method.
- B. Coarse Aggregate: Shall conform to the requirements in Section 703 in the current edition of PennDOT Publication 408 including listed exceptions.
- C. Fine Aggregate: Shall conform to the requirements in Section 703 in the current edition of PennDOT Publication 408 including listed exceptions.

## 2.2 ASPHALT PAVING MATERIALS

- A. Asphalt Cement: Shall conform to the requirements in Section 702 in the current edition of PennDOT Publication 408 for AASHTO MP1, PG 64S-22.
- B. Tack Coat: Shall conform to the requirements in Section 460 in the current edition of PennDOT Publication 408 for emulsified asphalt, Class AE-T.
- C. Municipal Road or Private Driveways / Parking Lot Superpave Base, Binder and Wearing Surface: Superpave Asphalt Mixture Design, PG 64S-22; <0.3 million ESAL's; 9.5, 19.0- and 25.0-mm mix complying with the requirements for warm mix asphalt (WMA) in Section 413 in PennDOT Publication 408 (April 2020 edition). The bituminous wearing surface shall incorporate fine grade 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 Bulletin No. 14.
- D. Joint Sealant: Shall conform to the requirements for AET emulsified asphalt in Section 469 in the current edition of PennDOT Publication 408.
- E. State Road Base, Binder, and Wearing Surface: The Contractor shall use materials and construction methods meeting the requirements for WMA as required on the approved PennDOT Highway Occupancy Permit (HOP) (if applicable) at no additional cost to the Owner. Follow Section 413 in PennDOT Publication 408 (April 2020 edition) for all HMA material and construction additions and modifications.
- F. Suppliers: Shall be listed on PennDOT Bulletin 41.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Verify that the subgrade, subbase, and existing bituminous paving is dry and in suitable condition to support paving and imposed loads. Proof roll subgrade with a fully loaded triaxle to check for "soft spots" or unsuitable areas. Repair "soft spots" or unsuitable areas as directed. Payment for "soft spot" repair shall be as shown in the Bid Form and Proposal or considered incidental to bituminous paving items.
- B. Verify the crown of two (2%) percent across each traffic lane by using a template.
- C. Proceed with paving only after unsatisfactory conditions have been corrected.

## 3.2 REPAIRS

- A. Leveling Course: Install and compact leveling course consisting of warm mix asphalt 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 subgrade and all existing bituminous material are ready to receive paving. Proof roll subgrade with a fully loaded triaxle to check for "soft spots" or unsuitable areas. Repair "soft spots" or unsuitable areas as directed.
  - 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 binder 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 forty (40) degrees Fahrenheit and rising.
  2. Allow the 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 in 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 sole 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 EQUIPMENT

- A. Paver: Shall conform to Section 413.3(e).1 in PennDOT Publication 408 (April 202) 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, shove, 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) of PennDOT Publication 408 (April 2020 edition).
- C. Rollers: Use steel-wheel, pneumatic-tire, vibratory, or oscillating rollers as specified in PennDOT Publication 408 (April 2020 edition) Section 108.05(c)3a, 3b, 3c, 3e, 3f, 3h or 4. Operate rollers according to manufacturer's recommendations. Use vibratory and oscillating rollers with separate controls for frequency and amplitude.
- D. Hauling Equipment: Haul the mixtures in tightly sealed vehicles that do not contain petroleum oils, solvents, or other materials that adversely affect asphalt mixture. Provide covers of sufficient size and quality to protect the entire load under all conditions. Maintain the proper and uniform placement temperature as specified in Section 413.3(h)1 of PennDOT Publication 408 (April 2020 edition). Provide insulation on all sides of the truck body, a double-walled truck body, or a heated truck body when the air temperature is below fifty (50) degrees Fahrenheit from October 1 to April 30. Provide a three-eighths (3/8") inch diameter hole near the center and approximately two-thirds (2/3) the distance down from the top of the vehicular box, on both sides, to allow for asphalt mixture temperature checks.

### 3.5 ASPHALT MATERIAL INSTALLATION

- A. Machine place 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. Install the bituminous materials to the compacted depths stated in the details and unit price descriptions.
1. All asphalt materials shall be installed in accordance with PennDOT Publication 408 (April 2020)
  2. Do not place bituminous paving when the surface is wet or when its air or surface temperature is less than forty (40) degrees Fahrenheit.
  3. No asphalt material shall be installed if the temperature of the material is less than two hundred thirty (230) degrees Fahrenheit or greater than three hundred twenty (320) degrees Fahrenheit.
  4. Any bituminous material that has reached a temperature less than one hundred eighty (180) 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 and/or tarped until ready to dump asphalt into the paver or until empty. Any truck with an uncovered partial load waiting for unloading shall not be permitted to dump into the paver.
  7. No traffic shall be permitted on newly compacted hot mix asphalt material until its temperature is lower than one hundred forty (140) degrees Fahrenheit.
  8. Do not use kerosene on the paving equipment or tools.
  9. Promptly correct surface irregularities in the paving course behind the paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with asphalt to prevent segregation of mix. Use suitable hand tools to smooth surface.
  10. Bituminous tack coat shall be applied in accordance with PennDOT Publication 408 (April 2020) Section 460 to all bituminous base and binder courses when, in the opinion of the Engineer, the surface is not satisfactory for direct placement of the next course.
  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 (6") inches on the existing pavement.
  12. A twelve (12")-inch pass of PG 64S-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.
- B. All pavement edges shall be sealed with PG 64S-22 including the pavement next to the curb and around inlets and manholes. The sealing material shall be sanded at all driveways and at all roadway joints. The street must be sealed at the joints within two (2) working days after completion of asphalt placement.

## 3.6 TRENCH PAVING IN BITUMINOUS PARKING LOT OR DRIVEWAY

- A. The Contractor will be required to pave all trenches in bituminous parking lots or driveways as follows (or according to the Plan Detail): approved PennDOT Class 4, Type A geotextile; six (6")-inches compacted depth AASHTO #1 approved limestone; two (2")-inches compacted depth PennDOT 2A approved limestone; three and one-half (3.5")-inches compacted depth 19.0 mm Superpave binder and one and one-half (1.5")-inches compacted depth 9.5 mm fine grade Superpave wearing course. All material and installation shall be in accordance with PennDOT Publication 408 (April 2020).
- B. All joints shall be sealed with PG-64S-22.
- C. Trenches within bituminous pavement areas shall be saw cut prior to excavation and again prior to trench repaving to assure a straight edge during trench repaving. All required saw cutting shall be considered incidental to the unit price for trench paving in bituminous parking lots or driveways.
- D. Payment for trench paving in bituminous parking lots or driveways will be made on a square yard basis, complete in place, with maximum pay widths as shown on the Plans. This item shall also include the removal and off-site disposal of previously placed material prior to placement of the required final section.

## 3.7 TRENCH PAVING IN BITUMINOUS MUNICIPAL ROADWAYS

- A. The Contractor will be required to pave all trenches in bituminous Municipal roadways as follows (or according to the Plan Detail): approved PennDOT Class 4, Type A geotextile; six (6")-inches compacted depth AASHTO #1 approved limestone; two (2")-inches compacted depth PennDOT 2A approved limestone; five (5.0")-inches compacted depth 19.0 mm Superpave binder and one and one-half (1.5")-inches compacted depth 9.5 mm fine grade Superpave wearing course. All material and installation shall be in accordance with PennDOT Publication 408 (April 2020).
- B. All joints shall be sealed with PG-64S-22.
- C. Any incidental curb or sidewalk damage caused by bituminous Municipal roadway trench paving shall be replaced in kind. Payment for the work shall be by the applicable Bid Item. Damage caused by Contractor negligence during trench paving shall be repaired at the Contractor's sole cost and expense.
- D. Trenches within bituminous pavement areas shall be saw cut prior to excavation and again prior to trench repaving to assure a straight edge during trench repaving. All required saw cutting shall be considered incidental to the unit price for trench paving in bituminous Municipal roadways.
- E. Payment for trench paving in bituminous Municipal roadways will be made on a square yard basis, complete in place, with maximum pay widths as shown on the Plans. This item shall also include the removal and off-site disposal of previously placed material prior to placement of the required final section.

## 3.8 TRENCH PAVING IN STATE ROADWAYS (AS APPLICABLE)

- A. The Contractor will be required to pave all trenches in State roadways in complete compliance with all permit conditions shown on the Highway Occupancy Permit (HOP) and as shown on the HOP Pavement Restoration Detail including Notes. All material and installation shall be in accordance with PennDOT Publication 408 (April 2020).
- B. Payment for the above will be made on a square yard basis, complete in place, with a maximum pay width as shown on the Construction Details. This item shall also include the removal and off-site disposal of previously placed material so that the required section may be placed.

## 3.9 MILLING AND/OR PROFILE MILLING OF ASPHALT PAVEMENT SURFACES

- A. Remove existing asphalt pavement by milling and profiling milling to grades and cross sections indicated in accordance with PennDOT Publication 408/2020 (April 202) Sections 491 and 492 and as follows:
  - 1. Mill to a depth of 1-1/2 inches (+/-) or as listed on the Bid Form and Proposal or as shown on the Plan Detail or as required to achieve required proposed grades.
  - 2. Mill to a uniform finished surface free of gouges, grooves, and ridges.
  - 3. Milling shall be completed to a uniform crown section so that the milled centerline of the street is three (3") inches above the existing gutter grade. If the crown is not maintained, the Contractor shall re-mill the street.
  - 4. No milling shall damage any brick, concrete, or aggregate base.
  - 5. Control rate of milling to prevent tearing of existing asphalt course.
  - 6. Repair or replace curbs, manholes, and other construction items damaged during milling at the Contractor's sole expense.
  - 7. Bituminous curbs shall be removed during the milling of the street and replace according to applicable Contract provisions.
  - 8. The Contractor shall own and dispose of all milled material off the project site. The Township retains the right to direct the Contractor to haul a pre-determined amount of milled material to the Public Works Yard or other designated stockpile area at no additional cost to the Township.
  - 9. The Contractor shall control dust throughout the milling process.
  - 10. All surfaces must be swept with a power broom and vacuum truck after milling and prior to leaving the site at the conclusion of the workday.
  - 11. "Ramps" made of binder material are required at the drop off edges of milled streets, driveways, manholes and inlets per the Owner's direction after cleaning and prior to leaving the site at the conclusion of the workday. The installation of temporary ramps, as directed, shall be considered incidental to the milling Unit Price Item.
  - 12. The Contractor shall install lighted barricades, drums or cones on structures that do not receive a temporary asphalt "ramp" at the conclusion of the workday. The cost to install lighted barricades, drums or cones shall be considered incidental to the milling Unit Price Item.
  - 13. Follow PennDOT Publication 408/2020 (April 202) Sections 491 and 492 for all requirements for milling and profile milling in State roadways.
  - 14. Additional binder and/or wearing required to achieve plan grades for ADA compliance work shall be placed at no additional cost to the Owner.

**B. Milling Equipment**

1. Milling: Provide a milling machine designed and built for milling existing asphalt pavements with an automatic grade and slope control system and be capable of milling concrete patches.
2. Profile Milling: Provide a self-propelled milling machine capable of milling a full-lane width up to twelve (12') feet wide in one (1) pass.
3. Equip the milling machine with a built-in automatic grade control system to control the longitudinal profile and the transverse cross-slope. Provide longitudinal controls capable of operating from a longitudinal grade reference, including string line, ski thirty (30') feet minimum, mobile string line thirty (30') feet minimum, or matching shoe. Provide transverse controls with an automatic system for controlling cross-slope at a given rate.
4. Mount profiler cutters to the carrier in order to adjust and control them according to depth of cut and cross-slope. Longitudinal milling action may be produced either by a suitable carrier wheelbase or use of an automatic control system having an external reference. Provide either a variable or a constant cross-slope with cross-slope adjustments or automatic controls.
5. Design, maintain, and operate milling cutters to produce a surface free from grooves, ridges, gouges or other irregularities detrimental to the safe operation of vehicles in traffic routed onto the profiled surface.
6. Suitable supplemental equipment or methods may be used in small or confined areas and around utility facilities. Complete adjustment of utility facilities before the milling operation. Repair or replace utility facilities that are damaged by profiling operations to the complete satisfaction of the Facility Owner at no additional cost to the Township.

**C. Penalties**

1. A five hundred (\$500.00) dollar per occurrence penalty shall be assessed for uncontrolled dust during the milling process.
2. A five hundred (\$500.00) dollar per calendar day penalty shall be assessed for each day after five (5) calendar days that streets remain open after the milling has been completed without resurfacing.

## 3.10 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 six (6") inches.
  - 3. Offset transverse joints, in successive courses, a minimum of twenty-four (24") inches.
  - 4. Construct transverse and longitudinal joints per Penn DOT Publication 408 (April 2020).
- 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 64S-22 or approved equal.
  - 2. On pavements with bituminous wedge curbs, apply PG 64S-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 64S-22 or approved equal twelve (12") inches wide, two (2") inches of which shall be applied to the inside face of the curb.
  - 4. Apply sand at driveways and sidewalks.

## 3.11 COMPACTION

- A. Obtain compaction per PennDOT Publication 408 (April 2020) Section 413. Test as required.
- B. Compact 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 with fresh asphalt. Compact by rolling to the specified density and surface smoothness.
- D. Do not allow vehicular traffic or loads on newly compacted courses for twenty-four (24) hours or until the course uniformly cools to a temperature of one hundred forty (140) degrees Fahrenheit or less. Provide alternate routes as indicated or directed. Maintain the course as specified in Sections 105.13, 107.15 and 901 in the current edition of PennDOT Publication 408.

## 3.12 SURFACE MAINTENANCE REQUIREMENTS

- A. Provide and maintain all bituminous surfaces as required during the prosecution of the work. Trenches will not be allowed to "remain in stone" at any time.
- B. No additional compensation will be considered for surface maintenance regardless of the amount of material and/or time necessary for strict compliance with this Paragraph.

## 3.13 INSTALLATION TOLERANCES

- A. Depth: In accordance with PennDOT Publication 408 (April 2020) Section 413. Pavement deficient in depth by more than one-quarter (1/4") inch is defective work. Immediately correct courses or pavement that are deficient until the depth is within one-quarter (1/4") inch of the design depth.
- B. Surface Tolerance: Compact each course to produce a surface smoothness within the following tolerances as determined by using a ten (10')-foot straightedge applied transversely or longitudinally to paved areas:
  - 1. Base and Binder: Three-sixteenths (3/16") inch.
  - 2. Wearing: Three-sixteenths (3/16") inch
- C. Crowned Surfaces: Test using appropriate methods and procedures acceptable to the Owner and/or Owner's Representative to ensure the required crown cross section is obtained.

## 3.14 FIELD QUALITY CONTROL

- A. 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 forth in PennDOT Publication 408 (April 2020) Section 413 for nuclear gage testing. The test shall be performed by a licensed nuclear gage operator as witnessed by the Owner and/or Owner's Representative utilizing the following procedure set forth in PennDOT Publication 408 (April 2020) Section 413. The Contractor shall complete the following with regards to density testing:
    - a. Use a nuclear gage meeting the requirements of PTM No 402.
    - b. Use a nuclear gage calibrated in accordance with ASTM D 2950. Submit certification of annual calibration of gages and documentation of licensed operators training to the Owner and/or Owner's Representative 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 Owner or Owner's Representative daily.
  - 2. The Contractor will be paid for the placed material based on the above required testing and in accordance with PennDOT Publication 408 (April 2020) requirements. The Owner retains the right to verify the density testing in accordance with the above testing procedure to verify the results.

## 3.15 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 twenty-five (25') feet.
- B. Use a ten (10') foot straightedge to test for longitudinal irregularities on 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 five (5') foot increments.
- C. Correct all surface irregularities exceeding one-half (1/2") inch by loosening the surface and removing or adding material as required. Compact the corrected 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 ten thousand (10,000) tons to be tested by an independent laboratory.
  - 3. Asphalt Materials - Daily plant certification, plus one (1) 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. Drawings, Approved Permits, 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
  - 3. Driveways
  - 4. Concrete Encasement for Utilities
  - 5. Exposed Aggregate Sidewalk or Driveway

## 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 with 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. Admixtures.
  - 4. Curing compounds.
  - 5. Bonding agent or epoxy adhesive.
  - 6. Joint fillers.
  - 7. Patching materials.
- F. Field quality-control test reports.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who comply 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" or PennDOT and/or City of Pittsburgh approved batch plant.
  - 2. On-site batching of concrete will not be permitted.
  - 3. The use of fiber-reinforced concrete in lieu of placement of welded wire mesh or other reinforcement will not be permitted.
- B. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.
- C. Concrete Testing Service: The Contractor shall engage a qualified independent testing agency to perform material evaluation tests.

#### 1.6 PROJECT CONDITIONS

- A. Traffic Control: The Contractor shall maintain access for vehicular and pedestrian traffic as required for 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 one hundred (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 required to keep from deforming when concrete is placed.
- D. The entire front and rear face of the curb and/or walk must be formed. No "wild pours" or partial forming will be permitted.

## 2.3 STEEL REINFORCEMENT

- A. Plain-Steel Welded Wire Reinforcement: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.
- B. Epoxy-Coated Welded Wire Fabric: ASTM A 884/A 884M, Class A, plain steel.
- C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.
- D. Epoxy-Coated Reinforcing Bars: ASTM A 775/A 775M or ASTM A 934/A 934M; with ASTM A 615/A 615M, Grade 60 (Grade 420) deformed bars.
- E. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.

- F. Epoxy-Coated Joint Dowel Bars: ASTM A 775/A 775M; with ASTM A 615/A 615M, Grade 60, plain steel bars.
- G. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.
- H. Hook Bolts: ASTM A 307, Grade A, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.
- I. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete, and as follows:
  - 1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
  - 2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
- J. Epoxy Repair Coating: Liquid two-part epoxy repair coating, compatible with epoxy coating on reinforcement.

## 2.4 CONCRETE MATERIALS AND 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 595 Type 1L or ASTM C 150 Type II Entraining Portland Cement
- B. Normal-Weight Aggregates: ASTM C 33 coarse aggregate or better, graded. Provide aggregates from a sole source with documented service record data of at least ten (10) years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
  - 1. Coarse Aggregate: Per PennDOT Publication 408 (April 2020) Section 704 and the following: Type A, maximum size AASHTO No. 57 or No. 67 – Section 703.2
  - 2. Fine Aggregate: Per PennDOT Publication 408 (April 2020) Section 704 and the following: Type A – Section 703.1

- C. Exposed Aggregate (if required): Selected, hard, and durable; washed; free of materials with deleterious reactivity to cement or that cause staining; from a sole source, with gap-graded coarse aggregate as follows:
1. Aggregate Sizes: 1/2 to 3/4-inch or 3/8 to 5/8-inch, nominal (or as directed by the Owner or property owner or to match existing). Aggregate may also be natural gravel conforming to the size and grading requirements for AASHTO Number 67.
  2. Aggregate Color Mix: Sixty (60%) percent brown; Twenty (20%) percent light brown; twenty (20%) percent buff tan or as directed by the Owner and/or property owner to match existing.
  3. Submittal: Aggregates shall be selected by the Owner and/ or property owner from color samples submitted by the Contractor. The Contractor shall submit as many as two (2) one (1)-pound samples as required to satisfy the Owner and/or property owner.
  4. Mock-up: Construct a three (3') foot by three (3') foot sample. Do not place the exposed aggregate concrete until the sample has been approved by the Owner and/or property owner.
- D. Water: Use water conforming to ASTM C1602 that is reasonably clean, free from vegetable matter, oil, acid, alkali, sugar, or other substances injurious to the finished product.
- E. Slump shall be four (4") inches, plus or minus one (1") inch.
- F. Air Entraining Admixtures shall be in accordance with AASHTO Designation M-154 (ASTM C-260-01)
- G. Air content shall be five (5%) percent plus or minus one (1%) percent.
- H. The use of fiber-reinforced concrete in lieu of placement of welded wire mesh or bar reinforcement will not be considered or permitted.
- I. Concrete shall be PennDOT approved Class AAA with a twenty-eight (28) day structural design compressive strength of 4,000 psi or as shown on the approved HOP Construction Drawings (as applicable).
- J. Sulfate resistant concrete (if required): Provide design mix with appropriate water to cementitious material ration (w/cm) for use in high sulfate (very severe) environments. Provide Portland cements or cementitious material combinations specifically formulated for sulfate environments. Submit mix design for approval a minimum of ten (10) working days prior to placement of vertical surface seals.
- K. Patching Material: Polymer-modified, portland cement mortar (SikaTop 123 Plus or approved equal).

## 2.5 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately nine (9) ounces per square yard dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Curing Compound:
  - 1. Euclid Chemical Kurez DR VOX Dissipating Curing Compound
  - 2. Approved equal meeting ASTM C 309, Types 1 and 1D, Class A and B; AASHTO M 148, Types 1 and 1D, Class A and B.
  - 3. Must meet US EPA maximum allowable VOC requirements.

## 2.6 CONCRETE PRODUCTION METHODS

- A. Plant Mixed Cement Concrete: Concrete proportioned and mixed in either a stationary, commercial, and central plant or stationary plant located near the project. Concrete is delivered to the work site by truck, agitator truck, or mixer truck.
- B. Truck Mixed Cement Concrete: Cement prepared by dry batching in a proportioning plant and placing the dry ingredients in a truck mixer. Measured water is added to the truck drum from the plant water system and the concrete is mixed in the truck at the plant. Mixing is not allowed on the route to or at the work site.
- C. Volumetric Mixed Cement Concrete: No truck-mounted mobile mixer will be permitted on the work site.

## 2.7 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber (AASHTO-M213)
- B. Joint Sealant: Shall be one part polyurethane elastomeric sealant/adhesive – Sikaflex 1A (or approved equal). The color of sealant shall be limestone or as required to match concrete color.
- C. Bonding Agent: ASTM C 1059, Type II, non-dispersible, acrylic emulsion, or styrene butadiene.
- D. 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.
- E. Sealer: Forty (40%) percent silane sealer meeting NCHRP 244.

## PART 3 - EXECUTION

## 3.1 EXAMINATION AND PREPARATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Proof-roll prepared subgrade and subbase surfaces to identify soft pockets and areas of excess yielding.
- C. Proceed with concrete pavement operations only after nonconforming conditions have been corrected and subgrade and subbase are ready to receive pavement.

## 3.2 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 twenty-four (24) hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

## 3.3 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 bar supports 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. Concrete slabs shall be reinforced with 6" x 6" W2.9/W2.9 wire mesh or as shown on the Construction Details with a minimum cover of two (2") inches for sidewalks and three (3") inches for driveways. Place mesh on supports at no additional cost to the Owner.
- 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 two (2")-inch overlap of adjacent mats.
- G. Place bar reinforcement as shown on all applicable Details.

## 3.4 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 15<sup>th</sup> or after December 1<sup>st</sup> except with prior review of submitted procedures and written permission of same from the Owner. Cold weather concrete measures shall be provided at no additional cost to the Owner for concrete placed prior to April 15<sup>th</sup> or after December 1<sup>st</sup>.
- D. Protect and cure all concrete according to ACI 306 if the weather conditions are expected to be three (3) successive days when the average daily temperature drops below forty (40) degrees Fahrenheit and stays below fifty (50) degrees Fahrenheit for more than one-half (1/2) of any twenty-four (24) hour period.
- 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. No concrete shall be placed from a volumetric (mobile) concrete mixer. All concrete shall be delivered from a certified concrete plant.
- J. Discharge of the concrete shall be completed within ninety (90) minutes or before the drum has revolved three hundred (300) revolutions, whichever comes first, after the introduction of the mixing water to the cement and aggregates.
- K. No private, public or contractor vehicles and/or equipment shall be placed or moved on the concrete pavement until fourteen (14) days have elapsed from the time of pour, and then only when earth shoulders are placed against the pavement edges. The Contractor shall provide breaks at seven (7) and twenty-eight (28) days from the date of the pour to determine the strength.
- L. 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.
- M. The concrete shall be placed in forms in horizontal layers not to exceed five (5") inches and vibrated sufficiently to eliminate all voids.
- N. Concrete shall be poured from the lower elevation to the higher elevation of the proposed road, in an ascending grade.



- O. Place welded wire fabric or fabricated bar mats in final position supported at mid-depth by means of approved support chairs. Place concrete, strike off, and screed.
  - 1. Remove and replace concrete that has been placed for more than fifteen (15) minutes without being covered by top layer or use bonding agent if approved by Engineer.
- P. 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.
- Q. Screed pavement surfaces with a straightedge and strike off.
- R. 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.
- S. 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. Provide details showing the location of reinforcement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not approved, remove and replace with formed concrete.
- T. Hot-Weather Placement: Comply with ACI 305 and National Ready Mixed Concrete Association (NRMCA) recommendations if the temperature at the time of concrete placement will exceed seventy-seven (77) degrees Fahrenheit. No additional compensation will be considered for complying with this requirement.

### 3.5 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 the 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 medium finish by striating float-finished concrete surface one-sixteenth (1/16") to three-thirty seconds (3/32")-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 watered brush finish or plastering of the curb will be permitted. All joints and exposed edges shall be tooled to a radius of one-quarter (1/4") inch, but no tool marks will be permitted to show on the finished curb. Final finish shall be made with a coarse hairbrush.
- E. 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.

### 3.6 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 pounds per square foot x 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.
- C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

### 3.7 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. 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 (1/2) hour unless pavement terminates at isolation joints.
  - 1. Continue steel reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.
  - 2. Provide tie bars at sides of pavement strips where indicated.
  - 3. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least one and one-half (1.5") inches into concrete.
  - 4. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one-half (1/2) of dowel length to prevent concrete bonding to one side of joint.

- D. Isolation and Expansion 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 fifty (50') feet, unless otherwise indicated.
  2. Extend joint fillers full width and depth of joint.
  3. Terminate joint filler not less than one-half (1/2") inch or more than one (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 the 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.
- E. Contraction/Control Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth (1/4) of the concrete thickness, as follows (match jointing of existing adjacent concrete pavement where applicable):
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a one-quarter (1/4")-inch radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
  2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut one-eighth (1/8")-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks. Saw joints as soon as concrete is set enough to walk on and support the weight of the saw and no later than twenty-four (24) hours of concrete placement.
  3. Install contraction / control joints as follows:
    - a. Joints in concrete slabs: Five (5')-foot spacing maximum.
    - b. Joints in concrete curbs: Ten (10')-foot spacing maximum.
      - 1) Joints in concrete curbs shall be aligned to adjacent slab joints.
- F. Do not use the jointing or edging tool until the surface water has evaporated from the concrete (sheen disappears) on any tooled joints or edges of concrete. Bull float and broom the surface, then finish the joint and edges and use broom to remove the tool marks on the surface.

### 3.8 SEALING OF CONCRETE JOINTS, CURBS AND SLABS

- A. All joints, including isolation, expansion, and joints against structures, must be sealed.
- B. The sealant for driveways and sidewalks shall be "Sikaflex-1A" or approved equal. The color of sealant shall be limestone or to match the finished color of the concrete. Refer to manufacturers' specifications for additional requirements.
- C. Apply Sikaflex-1A at a temperature between forty (40) degrees Fahrenheit and one hundred (100) degrees Fahrenheit with a gun 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.
- D. Apply water based forty (40%) percent silane penetrating sealer a minimum of twenty-eight (28) days after placement of new concrete for curbs and slabs. Follow curing compound manufacturer's recommendations for removal prior to application of silane sealer. Apply sealer according to manufacturer's written recommendations.

### 3.9 BACKFILLING

- A. The Contractor shall not backfill against walks, driveways, curbs, etc. until concrete forms have been removed, the concrete cure time has elapsed, and authorization has been given by the Owner. All debris shall be removed from excavations prior to backfilling operations. In lawn or ground cover areas, backfilling shall be done with clean earth placed in six (6") inch compacted layers. Backfilling of walks, driveways, curbs, etc. shall be considered incidental to the Proposal Unit Price.

### 3.10 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 Owner, 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 fourteen (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 materials. Sweep concrete pavement not more than two (2) days before date scheduled for Final Completion inspections.

- E. Polymer-modified portland cement mortar surface preparation: Areas to be repaired must be clean, sound, and free of contaminants. All loose and deteriorated concrete shall be removed by mechanical means. Mechanically prepare substrate to obtain a surface profile of  $\pm 1/16''$  (CSP 5 or greater as per ICRI Guidelines) with a new exposed aggregate surface. Area to be patched shall not be less than  $1/8''$  in depth. Where reinforcing steel with active corrosion is encountered, sandblast the steel to a white metal finish to remove all contaminants and rust. Where corrosion has occurred due to the presence of chlorides, the steel shall be high pressure washed after mechanical cleaning. Prime steel with two (2) coats of Sika Armatec 110 EpoChem (or approved equal) as per the Product Data Sheet (See Spec Component SC-201-0699).
- F. Polymer-modified portland cement mortar mixing: Mechanically mix in an appropriately sized mortar mixer or with a mud paddle and low speed drill. Follow manufacturer's written mixing instructions. Mix only that amount of material that can be placed in ten (10) to fifteen (15) minutes. Do not retemper material.
- G. Polymer-modified portland cement mortar placement procedure: At the time of application, the substrate shall be saturated surface dry with no standing water. Mortar must be scrubbed into substrate filling all pores and voids. While the scrub coat is still plastic, force material against edge of repair, working toward center. If repair area is too large to fill while scrub coat is still wet use Sika Armatec 110 EpoChem (or approved equal) in lieu of scrub coat (See Spec Component SC-200-0699). After filling, consolidate then screed. Allow mortar to set to desired stiffness then finish with trowel for smooth surface. Wood float or sponge float for a rough surface. Areas where the depth of the repair to sound concrete is greater than one and one half (1.5")-inches, the repair shall be made in lifts of one and one-half (1.5")-inches maximum thickness. The top surface of each lift shall be scored to produce a rough surface for the next lift. The preceding lift shall be allowed to reach the final set before applying fresh material. The fresh mortar must be scrubbed into the preceding lift. Adhere to all procedures, limitations and cautions for the polymer-modified portland cement mortar in manufacturer's most current printed technical data and literature.
- H. Polymer-modified portland cement mortar placement curing: Curing is required as per ACI recommendations for portland cement concrete. Moist cure with wet burlap and polyethylene, a fine mist of water or a water-based compatible curing compound (pre-testing of curing compound is recommended). Moist curing should commence immediately after finishing and continue for forty-eight (48) hours. Protect newly applied material from rain, sun, and wind until compressive strength is seventy (70%) percent of the twenty-eight (28) day compressive strength. To prevent from freezing, cover with insulating material. Setting time is dependent on temperature and humidity.

## 3.11 PAVEMENT TOLERANCES

## A. Comply with tolerances of ACI 117 and as follows:

1. Elevation: 1/4" – No slopes shall exceed ADA tolerances if required.
2. Thickness: Plus 3/8", minus 1/4"
3. Surface: Gap below ten (10')-foot long, unlevelled straightedge not to exceed 1/4"
4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1"
5. Vertical Alignment of Tie Bars and Dowels: 1/4"
6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2"
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4" per 12"
8. Contraction Joint Depth: Plus 1/4", no minus.
9. Joint Width: Plus 1/8" no minus.
10. Pavement Width: Plus 1", no minus.
11. Horizontal Alignment: Gap between ten (10')-foot long straightedge not to exceed 1/2"
12. Color: Natural concrete gray-tone and uniform within acceptable industry standards.

## 3.12 FIELD QUALITY CONTROL

- A. Testing Agency: The Contractor shall contract with a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports. The cost of testing shall be included in the Bid Item considered most appropriate by the Contractor.
- B. Testing: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: Perform one (1) slump and one (1) air test for the first load of each day. Prepare four (4) compression test cylinders for the first load of each day and for every twenty-five (25) cubic yards thereafter. Test for the following including but not limited to:
    - a. Slump: ASTM C 143/C 143M
    - b. Air Content: ASTM C 231, pressure method
    - c. Concrete Temperature: ASTM C 1064
    - d. Compression Test Specimens: ASTM C 31/C 31M
    - e. Compressive-Strength Tests: ASTM C 39/C 39M.
- C. Strength of each concrete mix will be satisfactory if average of any three (3) consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive strength test value falls below specified compressive strength by more than five hundred (500) psi.
- D. Test results shall be reported in writing to Owner, concrete manufacturer, and Contractor within forty-eight (48) hours of testing. Reports of compressive-strength tests shall contain project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at twenty-eight (28) days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both seven (7) and twenty-eight (28)-day tests.

- E. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Owner.
- F. Remove and replace concrete pavement where test results indicate that it does not comply with specified requirements.
- G. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

### 3.13 CONCRETE SIDEWALK RESTORATION OR PLACEMENT

- A. The Contractor shall prepare the concrete sidewalk by removing the damaged existing concrete slab to the next existing joint. All removed material shall be taken to an approved off-site facility.
- B. The Contractor shall remove a sufficient amount of material to allow for the installation of four (4") inches of approved AASHTO #57 limestone and four (4") inches of 4,000 psi 28-day concrete (PennDOT Class AAA concrete). The Contractor will be directed by the Owner's Representative as to the limits of sidewalk removal to achieve appropriate grades for a smooth transition.
- C. The Contractor shall protect adjacent slabs from damage. In the event adjacent slabs are damaged during restoration, the Contractor shall replace such slabs at his sole cost and expense.
- D. The sidewalk shall be reinforced with 6 x 6 -W2.9 x W2.9 (or most current designation) or as shown on the Construction Detail with a minimum cover of two (2") inches and placed on approved support chairs.
- E. Sidewalks shall be saw-cut prior to any work being completed. Saw cutting shall be included in the price of the sidewalk restoration.
- F. 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 required 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.
- G. The concrete shall be thoroughly vibrated to eliminate voids within the placed concrete.
- H. Contraction joints shall be spaced at a minimum of five (5') foot intervals and formed with a device to have the completed joint one-quarter (1/4) of the slab depth or one (1") inch, whichever is greater. Expansion joints shall be spaced no more than fifty (50') feet apart and formed with one-half (1/2") inch pre-molded filler to the full depth of the slab. The one-half (1/2") 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.

- I. 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 broom-finished as described elsewhere in these Specifications. 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.
- 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.
- K. The concrete shall be cured by the application of a dissipating liquid membrane forming curing compound meeting ASTM C 309, Types 1 and 1D, Class A and B and AASHTO M 148, Types 1 and 1D, Class A and B. Apply per manufacturer's written instructions. Submit alternate methods for approval as required.
- L. Insulated protection of the concrete shall be required dependent on the weather conditions at the time of placement and during the curing period. A vis-quene cover shall be considered the minimum protection for the concrete during adverse weather conditions. Determination of whether the concrete requires a vis-quene cover or blankets shall be reserved solely for the Owner. Damaged concrete due to failure of the Contractor to provide adequate protection against weather conditions shall be replaced at the Contractor's sole expense.
- M. Rain conductors under the driveway shall be replaced in kind with a piece of No. 9 gauge wire mesh reinforcing one (1') foot wide placed over them for reinforcement. In addition, a construction joint shall be placed over the rain conductor location. No additional compensation will be allowed for the restoration of rain conductors under driveways.
- N. All gas valves, water valves, sewer vents, or other appurtenances encountered during sidewalk restoration shall be adjusted to the finished grade of the sidewalk at no additional cost to the Owner.
- O. Apply water based forty (40%) percent silane penetrating sealer a minimum of twenty-eight (28) days after placement of new concrete. Apply sealer according to manufacturer's recommendations. Remove curing compound as required per manufacturer's recommendations prior to application of sealer.



## 3.14 CONCRETE CURB AND GUTTER RESTORATION OR PLACEMENT

- A. Concrete curb (and gutter) shall be replaced in kind at the same width and depth as was removed. No additional compensation will be granted relative to the width of the curb. Concrete curb (and gutter) shall be installed in accordance with the Detail provided or as required to match 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. A 2-ply tar paper must be placed between the AASHTO base and the concrete curb.
- D. Contraction joints must be placed at ten (10') feet on center.
- E. Expansion joints shall be spaced no more than thirty (30') feet apart and formed with 1/4" pre-molded filler to the full depth of the slab. The 1/4" 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.
- F. The concrete shall be thoroughly vibrated to eliminate voids within the placed concrete.
- G. The finish on the concrete shall match the finish of the existing curb.
- H. Sealing of Joints
  - 1. All joints, both expansion and joints against structures, must be sealed.
  - 2. The sealant shall be Sikaflex 1A or approved equal. The color of sealant shall be limestone. Refer to manufacturers' specifications for more details.
- I. The concrete shall be cured by the application of a dissipating liquid membrane forming curing compound meeting ASTM C 309, Types 1 and 1D, Class A and B and AASHTO M 148, Types 1 and 1D, Class A and B. Apply per manufacturer's written instructions. Submit alternate methods for approval as required.
- J. If any rain conductors exist through the curb, they shall be replaced in kind. No additional compensation will be provided for the restoration of rain conductors through the curb.
- K. 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. The type of protection shall be determined by the Owner and/or the Owner's Representative and furnished by the Contractor at no additional cost. Damage for failure to provide adequate protection shall be repaired at the Contractor's sole cost and expense.
- L. Apply water based forty (40%) percent silane penetrating sealer a minimum of twenty-eight (28) days after placement of new concrete. Apply sealer according to manufacturer's recommendations. Remove curing compound as required per manufacturer's recommendations prior to application of sealer.

- M. Provide forms, mesh, chairs, reinforcement, and concrete as required to place curb (and gutter) per the applicable Detail(s).
- N. Slipform curbing will be considered on an individual basis. Provide submittals before slip forming. Contractors shall note that slip form curb must be reinforced.

### 3.15 CONCRETE ENCASEMENT FOR UTILITIES

- A. Under this Item, the Contractor shall be required to install concrete encasement around utility lines that are exposed within twelve (12") inches of a proposed sewer or as shown on the Plans.
- B. The installation of concrete encasement shall be completed with an eight (8") inch minimum bed of air entrained, 4,000 psi high early strength (HES) concrete. The concrete shall extend up the sides of the utility line and be placed to a minimum depth of at least eight (8") inches above the utility line. Steel reinforcement shall be placed according to the Detail.
- C. The concrete shall be cured for a minimum of four (4) hours prior to backfilling. The Owner reserves the right to extend the curing period until the concrete has cured sufficiently so that the encasement does not become damaged during backfilling operations.

### 3.16 EXPOSED AGGREGATE SIDEWALK OR DRIVEWAY

- A. Remove existing sidewalk and/or driveway slab and overlay within limits indicated.
- B. Saw-cut sidewalk slabs or as directed. Chip additional concrete as required to full extent of removal to avoid damage to existing waterproof membrane if present.
- C. Wire brush clean and paint exposed existing reinforcement steel with epoxy paint.
- D. Place wire mesh or rebar as indicated with a minimum two (2")-inch cover.
- E. Finish place cement concrete to the indicated lines and grades.
- F. The exposed aggregate finish for sidewalks and driveways shall be constructed as follows:
  - 1. Apply retardant with a low-pressure spray immediately after screeding when concrete has lost its sheen, usually within one (1) hour after concrete is placed.
  - 2. All finishing work must be completed prior to the application of the retarder.
  - 3. Any mechanical floating or finishing after application will produce excessive and irregular depths of retardation. Cover with wet burlap or plastic sheet to prevent surface from drying out.
  - 4. Within twenty-four (24) hours after concrete is placed, remove the soft retarded mortar with a hose spray and stiff broom. If it is necessary to wait until the next working day to remove the retarded mortar (to achieve the degree of reveal specified) spray with a fine mist and apply moisture-curing material as soon as possible. After removal of all loose retarded materials, spray with fine mist and apply/re-apply moisture curing material as soon as possible.
  - 5. After three (3) days curing, clean exposed aggregate surface with a five (5%) percent solution of muriatic acid, brush, and flush with water. Re-apply moisture curing material and leave in place a minimum of seventy-two (72) hours.

6. Do not remove forms for twenty-four (24) hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas.
7. Remove and replace areas of sections with major defects as directed by the Owner.
8. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than seventy-two (72) hours. Apply curing and protective covers as necessary to cover the entire surface.
9. Begin the final curing procedure immediately following initial curing and before concrete has dried. Continue final curing for at least three (3) days and in accordance with ACI 301 procedures. Avoid rapid drying at the end of the final curing period.
10. Clean the entire surface from debris, dust, and mud, etc. prior to application of sealer coat.

END OF SECTION 02751

## SECTION 02764 - PAVEMENT JOINT SEALANTS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings, Approved Permits, 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. Expansion and contraction joints within cement concrete pavement.
  - 2. Joints between cement concrete and asphalt pavement.
- B. Related Sections include the following:
  - 1. Division 2 Section "Asphalt Paving" for constructing joints between concrete and asphalt pavement.
  - 2. Division 2 Section "Cement Concrete Pavement" for constructing joints in concrete pavement.

## 1.3 SUBMITTALS

- A. Product Data: For each joint sealant product indicated.
  - 1. For primers and substrate preparation needed for adhesion.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for sealants.

## 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multi-component materials.
- B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

## 1.6 PROJECT CONDITIONS

- A. Do not proceed with the installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below forty (40) degrees Fahrenheit.
  - 2. When joint substrates are wet or covered with frost.
  - 3. Where joint widths are less than those allowed by joint sealant manufacturer for applications indicated or outside Specification tolerances.
  - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the work include, but are not limited to, products listed in other Part 2 articles. Products not listed but considered as "or equal" by the Contractor may be submitted for review and approval by the Engineer.

### 2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.

## 2.3 COLD APPLIED JOINT SEALANTS

- A. Grade NS Polyurethane Sealant for Concrete: Single-component, moisture-cured, polyurethane-based, non-sag elastomeric sealant meeting Federal Specification TT-S-00230C, Type II, Class A as well as ASTM C-920, Type S, Grade NS, Class 35, use T, NT, O, M, G and I. Sealant shall be "Sikaflex 1A" or approved equal. The color of sealant shall be limestone or as required to match the finished color of the concrete or as chosen by the Owner.
- B. Grade P Silicone Sealant for Concrete: Single-component, ultra low modulus, elastomeric, neutral cure, silicone sealant meeting requirements of ASTM D-5893; ASTM C-920, Type S, Grade P, Class 100/50; Use T, M, G, A, and O with an ultra low Shore Hardness; TT-S-00230C, Type 1, Class A; TT-S-001543A, Class A.
- C. Multicomponent Low-Modulus Sealant for Concrete and Asphalt: Proprietary formulation consisting of reactive petropolymer and activator components producing a pourable, self-leveling sealant.

## 2.4 HOT APPLIED JOINT SEALANTS

- A. Elastomeric Sealant for Concrete: Single-component formulation complying with ASTM D 3406.
- B. Sealant for Concrete and Asphalt: Single-component formulation complying with ASTM D 3405.

## 2.5 JOINT SEALANT BACKER MATERIALS

- A. General: Provide joint-sealant backer materials that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint-sealant manufacturer based on field experience and laboratory testing.
- B. Round Backer Rods for Cold- and Hot-Applied Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.
- C. Backer Strips for Cold- and Hot-Applied Sealants: ASTM D 5249; Type 2; of thickness and width required to control sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.
- D. Round Backer Rods for Cold-Applied Sealants: ASTM D 5249, Type 3, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.

## 2.6 PRIMERS

- A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions.
- B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint sealant manufacturer, based on pre-construction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.

## 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of backer materials.
  - 2. Do not stretch, twist, puncture, or tear backer materials.
  - 3. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
  - 1. Place sealants so they directly contact and fully wet joint substrates.
  - 2. Completely fill recesses provided for each joint configuration.
  - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

- E. Tooling of Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
  - 1. Remove excess sealants from surfaces adjacent to joint.
  - 2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.
- F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions, unless otherwise indicated.
- G. Provide recessed joint configuration for silicone sealants of recess depth and at locations indicated.

### 3.4 CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

### 3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion (or Final Completion as applicable). If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations with repaired areas are indistinguishable from the original work. Perform remediation work at no additional cost to the Owner.

END OF SECTION 02764



## SECTION 02821 – CHAIN LINK FENCES AND GATES

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings, Approved Permits, 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. Chain Link Fences: Industrial and Residential.
  - 2. Gates: Swing.

- B. Related Sections include the following:

- 1. Division 2 "Earthwork" for site excavation, fill, and backfill where chain link fences and gates are located.

## 1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide chain-link fences and gates capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

- 1. Minimum Post Size and Maximum Spacing for Wind Velocity Pressure: Determine based on mesh size and pattern specified, and on the following minimum design wind pressures and according to CLFMI WLG 2445:

- a. Wind Speed: 115 mph.
    - b. Fence Height: As Indicated on Contract Drawings.
    - c. Line Post Group: IA, ASTM F 1043, Schedule 40 steel pipe.
    - d. Wind Exposure Category: B.

- 2. Determine minimum post size, group, and section according to ASTM F567 for framework as stated and post spacing not to exceed ten (10') feet.

- B. Lightning Protection System: Maximum grounding-resistance value of twenty-five (25) ohms under normal dry conditions.

## 1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences and gates.
  - 1. Fence and gate posts, rails, and fittings.
  - 2. Chain link fabric, reinforcements, and attachments.
  - 3. Gates and hardware.
  - 4. Gate operators, including operating instructions.
- B. Shop Drawings: Show locations of fences, gates, posts, rails, tension wires, details of extended posts, extension arms, gate swing, or other operation, hardware, and accessories. Indicate materials, dimensions, sizes, weights, and finishes of components. Include plans, gate elevations, sections, details of post anchorage, attachment, bracing, and other required installation and operational clearances.
- C. Samples for Initial Selection: Manufacturer's color charts or six (6")-inch lengths of actual units showing the full range of colors available for components with factory-applied color finishes.
- D. Samples for Verification: For each type of chain-link fence and gate indicated.
- E. Product Certificates: For each type of chain-link fence, and gate, signed by product manufacturer.
  - 1. Strength test results for framing according to ASTM F 1043.
- F. Qualification Data: For Installer.
- G. Field quality-control test reports.
- H. Maintenance Data: For the following to include in maintenance manuals:
  - 1. Polymer Finishes
  - 2. Powder Coat Finishes

## 1.5 QUALITY ASSURANCE

- A. **Installer Qualifications:** An experienced installer who has completed chain-link fences and gates similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
  - 1. **Engineering Responsibility:** Preparation of data for chain-link fences and gates, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. **Testing Agency Qualifications:** An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
  - 1. **Testing Agency's Field Supervisor:** Person currently certified according to NETA ETT, or the National Institute for Certification in Engineering Technologies, to supervise on-site testing specified in Part 3.
- C. **Electrical Components, Devices, and Accessories:** Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

## 1.6 PROJECT CONDITIONS

- A. **Field Measurements:** Verify layout information for chain-link fences and gates shown on Drawings in relation to property surveys and existing structures. Verify dimensions by field measurements.
- B. **Interruption of Existing Utility Service:** Do not interrupt utility services to 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 the Owner, Facility Owners, property owners, and/or the Engineer at least three (3) days in advance of proposed interruption of utility services.
  - 2. Do not proceed with interruption of utility services without the Facility Owner's and the Owner's and/or Engineer's written permission.

## PART 2 - PRODUCTS

### 2.1 TEMPORARY CONSTRUCTION CHAIN LINK FENCE

- A. Unless noted otherwise on Drawings, temporary construction chain link fence shall be minimum two (2") inch mesh, nine (9) gage, galvanized steel, chain-link fabric fencing; minimum six (6') feet height with galvanized steel pipe posts. 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts with 1-5/8-inch OD top and bottom rails. Provide concrete, or other suitable ballast, base for supporting posts.

## 2.2 CHAIN LINK FENCE STEEL FRAMEWORK

- A. Unless noted otherwise on the Drawings, minimum Nominal Framework Sizes shall be the following:

| SCHEDULE 40 S/L PIPE TABLE |                           |                          |                         |                        |
|----------------------------|---------------------------|--------------------------|-------------------------|------------------------|
| Nominal Size               | Outside Diameter (Inches) | Inside Diameter (Inches) | Wall Thickness (Inches) | Nominal Weight (Lb/Ft) |
| 1-1/4                      | 1.660                     | 1.380                    | 0.140                   | 2.27                   |
| 1-1/2                      | 1.900                     | 1.610                    | 0.145                   | 2.71                   |
| 2                          | 2.375                     | 2.067                    | 0.154                   | 3.65                   |
| 3                          | 3.500                     | 3.068                    | 0.216                   | 7.58                   |
| 4                          | 4.500                     | 4.026                    | 0.237                   | 10.80                  |

## 2.3 CHAIN LINK FABRIC

- A. General: Height indicated on Drawings. Provide fabric in one-piece heights for fence heights up to ten (10') feet measured between top and bottom of outer edge of selvage knuckle or twist. Comply with ASTM A 392, CLFMI CLF 2445, and requirements indicated below:
1. Steel Wire Fabric: PVC-coated wire
    - a. 0.148-inch (9 gauge) diameter for fences and gates.
  2. Mesh Size:
    - a. Two (2") inches for fences.
  3. Selvages: Knuckled top and bottom.

## 2.4 SWING GATE FRAMES

- A. Assemble gate frames with fully coped welds as shown on the Drawings or on Shop Drawings approved by the Owner and/or Engineer.
1. All ferrous metal components shall be blast cleaned to and SSPC-6 commercial blast clean.

## 2.5 GATE HARDWARE

- A. Hinges: Non-lift-off type, offset to permit one hundred eighty (180) degree swing, and of suitable size and weight to support gate. Provide three (3) hinges for each leaf over six (6') feet high.
- B. Latch: Provide plunger bar type complete with flush plate set in concrete for all double gates and single gates over ten (10') feet. Padlock eye shall be an integral part of latch construction.
  - 1. Provide plunger bar complete with flush plate set in concrete on each gate leaf.
  - 2. Provide flush plate set in concrete for both the full-open position and full-closed position.
- C. Keeper for Vehicle Gates: Provide keeper which automatically engages the gate leaf and holds it in an open position until manually released.

## 2.6 MISCELLANEOUS MATERIALS AND ACCESSORIES

- A. Post Tops: Steel, wrought iron, or malleable iron.
- B. Stretcher Bars: One piece equal to full height of fabric, minimum cross-section 3/16 inch by 3/4 inch.
- C. Metal Bands (for stretcher bars): Steel, wrought iron, or malleable iron, to secure stretcher bars to end, corner, pull and gate posts.
- D. Wire Ties:
  - 1. For tying fabric to line posts, rails, and braces: nine (9) gauge steel wire.
  - 2. For tying fabric to tension wire: eleven (11) gauge steel hog rings.
- E. Truss Rods: 3/8-inch diameter.
- F. Tension Wire: coiled spring steel wire, seven (7) gauge.
- G. Angle Beams, I Beams and Steel Shapes: ASTM A-36.
- H. Bolts and Nuts: ASTM A-307, Grade A.

## 2.7 FINISHES

### A. Steel Framework:

#### 1. PVC Coated Pipe

- a. Thermally-bonded polyvinyl chloride (PVC), plastic resin finish, ASTM F 668, Class 2, not less than 10 mils (.010 inch) thick over metallic-coated steel wire.
- b. Color: Black, complying with ASTM F 934.

### B. Chain Link Fabric:

#### 1. PVC Coated Chain Link Fabric:

- a. Thermally bonded polyvinyl chloride (PVC), plastic resin finish, ASTM F 668, Class 2, not less than 10 mils (.010 inch) thick over metallic-coated steel wire.
- b. Color: Black, complying with ASTM F 934.
- c. Coat selvage ends of fabric that is metallic coated before the weaving process with manufacturer's standard clear protective coating.

### C. Gates:

#### 1. Colored Powder Coated Framework

- a. Powder for coating shall be a polyester-based thermal setting resin.
- b. Powder coat system shall meet or exceed the following test requirements:
  - 1) Direct Impact Resistance: ASTM D 2794-93, up to 160 in-lbs.
  - 2) Flexibility: ASTM D 522-93, Method B, equal to or less than a 1/4-inch mandrel
  - 3) Pencil Hardness: ASTM D 3363-93a, HB-2H.
  - 4) Crosshatch Adhesion: ASTM D 3359-97, Method B, 5B.
  - 5) Salt Spray Resistance: ASTM B 117, plus 1,000 hours.
  - 6) Humidity Resistance: ASTM D 2247, plus 1,000 hours.

#### 2. Chain link fabric on gate shall match fencing.

### D. Fence and Gate Hardware, Miscellaneous Materials, Accessories:

1. Fence Hardware, Materials and Accessories:
  - a. Per fence finish requirements.
2. Gate Hardware, Materials and Accessories:
  - a. Per gate finish requirements.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance.
  - 1. Do not begin installation before final grading is completed, unless otherwise permitted by Owner.
  - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of five hundred (500') feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

## 3.3 INSTALLATION, GENERAL

- A. Install chain-link fencing to comply with ASTM F 567 or more stringent requirements if specified.
  - 1. Install fencing on established boundary lines inside property line.

## 3.4 CHAIN LINK FENCE INSTALLATION

- A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- B. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
  - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
  - 2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
    - a. Exposed Concrete: Extend two (2")-inches above grade; shape and smooth to shed water.
- C. Sleeves: As indicated on the Contract Drawings and Details.
- D. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of fifteen (15) degrees or more.
- E. Line Posts: Space line posts uniformly at ten (10') feet on center or as specified on the Drawings.

- F. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Install braces at end and gate posts and at both sides of corner and pull posts.
1. Locate horizontal braces at mid-height of fabric six (6') feet or higher, on fences with top rail and at 2/3 fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.
- G. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch- diameter hog rings of same material and finish as fabric wire, spaced a maximum of twenty-four (24") inches on center. Install tension wire in locations indicated before stretching fabric.
1. Top Tension Wire: Install tension wire through post cap loops.
  2. Bottom Tension Wire: Install tension wire within 6 inches of bottom of fabric and tie to each post with not less than same diameter and type of wire.
- H. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- I. Bottom Rails: Install, spanning between posts.
- J. Chain-Link Fabric: Apply fabric to the outside of enclosing framework. Leave one (1")-inch between finish grade or surface and bottom selvage, unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.
- K. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than fourteen (14")-inches on center.
- L. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of one hundred eighty (180) degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.
1. Maximum Spacing: Tie fabric to line posts at twelve (12")-inches on center and to braces at twenty-four (24")-inches on center.
- M. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.



### 3.5 ADJUSTING

- A. Gate: Adjust gate to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware and other moving parts.

END OF SECTION 02821

## SECTION 02850 – INCIDENTAL RESTORATION REQUIREMENTS

## 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 the following:

- 1. Street Sign Reinstallation
- 2. Relocation or Support of Utilities
- 3. Planters, Trees, and Shrubs
- 4. Wall Restoration
- 5. Fence Restoration
- 6. All Other Disturbed Areas

- B. Related Sections include the following:

- 1. Division 2 Section “Storm Drainage” for the installation of storm sewers.
- 2. Division 1 Section “General Project Requirements” for general project requirements.
- 3. Division 1 Section “Traffic Control and Notifications” for traffic control and notification requirements.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

## 3.1 STREET SIGN REINSTALLATION

- A. The Contractor shall re-install all stop signs, speed limit signs, school zone signs, street name signs and other traffic control signs that are damaged or removed during construction. The Contractor shall use the existing signs and posts unless otherwise directed by the Municipality.
- B. The Contractor shall re-install the signs in the location specified by the Owner and in accordance with the PennDOT's Specifications.
- C. The Contractor shall install a PVC sleeve in any concrete sidewalk where signs need to be removed and replaced. Drilling through the sidewalk to re-install signs will not be permitted.
- D. Payment for this item shall be included in the “Site Cleanup, Plantings and Site Restoration” Bid Item or considered incidental to the Bid.

### 3.2 RELOCATION OR SUPPORT OF UTILITIES

- A. The Contractor shall contact the appropriate Facility Owner prior to construction to determine Facility Owner requirements and costs associated with relocation or support if the Plans or field conditions show a conflict with utility poles, guy wires or other services,
- B. The Contractor shall coordinate with the Facility Owner all required relocations or support at no additional cost to the Owner.
- C. Relocated or supported facilities shall be constructed in accordance with the requirements of the Facility Owner at no additional cost to the Owner.
- D. Utilities include, but are not limited to water, electric, gas, telephone, cable TV and data.
- E. Payment for compliance with this Paragraph shall be included in the "Traffic Control; Site Protection; PennDOT Notification; Resident Notification; Utility Notification, Coordination, and Removal and Utility Shoring" Bid Item or considered incidental to the Bid.

### 3.3 PLANTERS, TREES, AND SHRUBS

- A. The Contractor shall re-install in-kind all planters, trees and shrubs damaged or removed during construction in a location approved by the property owner.
- B. The Contractor shall install all new trees, shrubs, and miscellaneous landscaping items per Plan and associated Details.
- C. A qualified Municipality-approved Landscape Subcontractor shall install all trees, shrubs, and landscaping items whether new or replaced.
- D. Payment for this item shall be included in the "Site Cleanup, Plantings, and Site Restoration" Bid Item or considered incidental to the Bid.

### 3.4 WALL RESTORATION

- A. The Contractor shall re-install in kind any wall damaged or removed during construction.
- B. The Contractor shall construct the new wall in accordance with the manufacturer's requirements.
- C. A qualified Municipality-approved Wall Subcontractor shall build new walls or rebuild removed walls.
- D. Payment for this item shall be included in the "Site Cleanup, Plantings and Site Restoration" Bid Item or considered incidental to the Bid.

## 3.5 FENCE RESTORATION

- A. The Contractor shall re-install in kind all fences damaged or removed during construction.
- B. The Contractor shall construct the new fence in accordance with the manufacturer's requirements.
- C. A qualified Municipality-approved Fence Subcontractor shall place new fence or replace removed fences.
- D. Payment for this item shall be included in the "Site Cleanup, Plantings and Site Restoration" Bid Item or considered incidental to the Bid.

## 3.6 ALL OTHER DISTURBED AREAS

- A. The Contractor shall restore in kind all other areas, including ingress and egress areas; and access and laydown areas, disturbed by his activity.
- B. Payment for this item shall be included in the "Site Cleanup, Plantings and Site Restoration" Bid Item or considered incidental to the Bid.

END OF SECTION 02850

## SECTION 02920 – SITE RESTORATION

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings, Approved Permits, 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, Sodding, and Maintenance.
  - 2. Preparation and Cleanup including Miscellaneous Items.

## 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 products 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 June 1
  - 2. Fall Planting: August 1 to October 15
  - 3. Immediately following backfilling new curbs, sidewalks and sewer trenches
  - 4. As directed by the Owner and/or Engineer
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

## 1.9 SEEDED OR SODDED AREA MAINTENANCE

- A. Begin maintenance immediately after each area is seeded or sodded and continue until acceptable growth is established, but for not less than the following periods:
  - 1. Seeded or Sodded Areas: Sixty (60) days from date of Substantial Completion (or Final Completion as applicable).
    - a. When full maintenance period has not elapsed before the end of planting season, or if lawn is not fully established, continue maintenance during next planting season.
- B. Maintain and establish seeded or sodded areas by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and re-mulch to produce a uniformly smooth area of growth.
  - 1. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch. Anchor as required to prevent displacement.
- C. Provide maintenance as required at no additional cost to the Owner.

## 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. Specialty Seeding: Follow Plans and/or Details for areas of specialty seeding (fields, wetlands, basins, rain gardens, swales, etc.)
- C. Permanent Seeding for Mowed Lawn or Seeded Areas:

Penn State Premium Lawn Mix (JMD Company) Mix (or Approved Equal)

| <u>Seed Type</u>                           | <u>Mix (%)</u> | <u>Germination (%)</u> |
|--------------------------------------------|----------------|------------------------|
| Diligent Perennial Ryegrass                | 19.93          | 90                     |
| Aspire Perennial Ryegrass                  | 19.77          | 90                     |
| Kentucky Bluegrass 85/80                   | 19.36          | 80                     |
| Banfield Perennial Ryegrass                | 19.18          | 90                     |
| Rosecity Creeping Red Fescue               | 10.01          | 85                     |
| Maxima 1 Creeping Red Fescue               | 10.00          | 85                     |
| Other Crop Seed / Weed Seed / Inert Matter | 1.75           | N/A                    |

Apply seed at four (4) to six (6) pounds per one thousand (1,000) square feet.

## 2.2 TOPSOIL

- A. Topsoil: Topsoil furnished by the Contractor shall consist of a natural friable surface soil without admixtures of undesirable subsoil, refuse, or foreign materials. It shall be shredded and free from roots, hard clay, rocks larger than one (1")-inch in any dimension, noxious weeds, tall grass, brush, sticks, stubble, or other litter, and shall be free-draining and non-toxic. Topsoil shall not contain more than ten (10%) percent gravel by dry weight of total sample. For the purposes of this Paragraph, gravel is defined per ASTM D422 modified to include only material passing one (1")-inch and retained on the No. 4 sieve.

Topsoil shall conform to the following requirements, as tested using the procedures included in ASTM D422, ASTM D2974 and AASHTO T267. The topsoil shall be tested by the Contractor and inspected by the Engineer before approval will be granted for its use.

Topsoil placed before testing and inspection shall be removed and replaced at no additional cost to the Owner.

| Category         | Topsoil Mix                          | Athletic / Sports Field                       | Sports Field / Infield Loam |
|------------------|--------------------------------------|-----------------------------------------------|-----------------------------|
| Organic Material | 15-25% by dry weight of total sample | Not less than 15% nor more than 25% by volume | 0.0%                        |
| Silt             | 25% to 45% by dry weight             | Not less than 20% nor more than 35% by volume | 80% by volume               |
| Sand             | 35% to 55% by dry weight             | Not less than 50% nor more than 55% by volume | 20% by volume               |

Required field depth: six (6")-inches after settling or as otherwise listed.

Organic material is to be determined by loss-on-ignition of oven-dried material in accordance with ASTM D2974.

## 2.3 FERTILIZER

- A. Commercial Fertilizer: Conforming to the requirements of the Pennsylvania Soil Conditioner and Plant Growth Substance Law, Act of December 1, 1977, P.L. 258, No 86 (3P.S.68.2), as amended. Use dry formulations of 10-20-20 analysis for seeded and sodded areas. Use dry formulations of 20-10-5 and 16-8-6 analysis for controlled release for tree, shrub, and vine type planting operations.

## 2.4 MULCHES

- A. Spent Mushroom Soil Compost: Comply with PennDOT Publication 408/2020 (April 2020) Section 805.2.g.

## 2.5 EROSION CONTROL MATERIALS

- A. Erosion Control Blankets: UV-stable polypropylene top net; seventy (70%) percent straw / thirty (30%) percent coconut fiber matrix; photodegradable polypropylene bottom net. Include manufacturer's recommended steel wire staples, six (6") inches long. Erosion control blankets shall be NAG SC150 (or approved equal).



## 2.6 SOD

- A. Sod: Provide sod conforming to the current edition of the Turfgrass Producers International Guideline Specifications to Turfgrass Sodding and as follows:
1. Certified sod cultivated of two (2) or more approved Kentucky bluegrass varieties containing not more than ten (10%) percent of other fine turf grass species and entirely free from weeds (as defined in the Pennsylvania Seed Act of 1965); harmful insects; disease; and nematodes.
  2. Sections shall be well-moistened rectangular machine cut twelve (12") to twenty-four (24") inches wide, two (2') to six (6') feet long with uniform soil thickness of approximately three-quarters (3/4") inches excluding top growth and thatch. Broken sections or sections having torn, or uneven ends will not be accepted. Grass height shall be a maximum of one and one-half (1.5") inches and relatively free of thatch (up to one-half (1/2") inch uncompressed thickness is acceptable).

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine areas to receive seed and/or sod 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 SEEDED OR LAWN PREPARATION AND PLACEMENT

- A. Limit seeded and/or lawn subgrade preparation to all disturbed areas that are not to be sodded.
- B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of six (6") inches. Remove stones larger than one (1")-inch in any dimension, sticks, roots, rubbish, and other extraneous matter and legally dispose of them at a fully permitted off-site facility outside of the Municipality.
  - 1. Install four (4") inches of new screened topsoil to the loosened subgrade.
  - 2. Apply spent mushroom soil compost at rate between one (1") and two (2") inches then incorporate into the soil to a depth of four (4") to six (6") inches.
  - 3. Seed, fertilize and apply approximately 1/4" of spent mushroom soil compost as topdressing. Rake the area lightly to ensure good seed-soil contact. Water well.
- C. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus one-half (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. Water daily to keep the soil uniformly moist until the new grass seedlings have reached one and one-half (1.5") inches in height.
- E. Restore areas if eroded or otherwise disturbed after finish grading and before planting.
- F. Grass not maturing within the specified period shall be re-established by the Contractor at his sole cost and expense.

### 3.4 SOD PREPARATION AND PLACEMENT

- A. Limit sod subgrade preparation to areas to be sodded.
- B. Place sod within thirty-six (36) hours after having been cut. Protect sod in temporary storage from drying due to sunlight or wind. Keep sod moist. Place sod when soil moisture and temperature conditions are suitable. Do not cut or place sod if the temperature is lower than thirty-two (32) degrees Fahrenheit. Do not place frozen sod.
- C. Till soil to a depth of three (3") to eight (8") inches. Import approved topsoil and place at depths from four (4") to (6") inches.
- D. Bring tilled soil to rough grade. Do not re-compact soil. Apply two and one-half (2.5) pounds of 10-20-20 fertilizer per one thousand (1,000) square feet and twenty-five (25) pounds of lime per one thousand (1,000) square feet. Mix lime and fertilizer into soil three (3") to four (4") inches in depth.
- E. Final grade soil surface by power or manual raking. Allow one-quarter (1/4") to one-half (1/2") inch along existing lawn areas and rake level with walks, curbs, etc. to allow for settlement.

- F. Do not dump sod from vehicles. Begin installation at a straight edge (sidewalk, driveway, etc.) or use a string. Start at the top of the slopes and work towards the bottom. Work from finished sod area, rather than soil, when possible. Stagger the sod pieces in a brickwork fashion. Break or stagger transverse joints. Butt edges tightly without overlapping. Use a spade or knife to trim ends or irregular pieces and around any trees, flower beds, stepping-stones, etc. Use sod pins when working on steep slopes. Place at least three (3) pins per sod piece. Roll sod before watering with a roller having a weight not more than sixty-five (65) pounds per foot of width.
- G. Immediately after rolling, saturate the sod area to its full depth. After initial watering, tamp the sod to close joints and ensure close contact between the sod and sod bed. Tamp to obtain a smooth sod surface, free from bumps and depressions.
- H. Water sod installed in or below seventy-five (75) degrees Fahrenheit once a day for the first ten (10) days around 1:00 p.m. for approximately twenty (20) minutes. Water sod installed in or above seventy-five (75) degrees Fahrenheit three (3) times a day for the first ten (10) days around 10:00 a.m., 1:00 p.m., and 4:00 p.m. for approximately twenty (20) minutes. Reduce watering to an as-needed basis after sod has rooted.
- I. Keep traffic off sod during heavy irrigation periods. Do not allow traffic on freshly placed sod for the first two (2) weeks after installation.
- J. Initial mowing shall be made after the sod has rooted or when sod pieces cannot be easily pulled from the soil. Set initial mower height to prevent removal of more than one-third (1/3) of leaf blade. Reduce engine rpm to avoid lifting sod. Follow normal mowing procedures after sod is fully rooted cutting bluegrass at one and one-half (1.5") to two (2") inches; fescue two (2") to three (3") inches, alternating directions, collecting clippings, and keeping mower blades sharp.
- K. Provide maintenance and mowing at no additional cost to the Owner.

### 3.5 HYDROSEEDING

- A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until it is uniformly blended into homogeneous slurry suitable for hydraulic application. Hydroseeding may be used after written permission from Owner for substitution from hand seeding is received. Submit proposed mulch, fertilizer, seed, tackifier, equipment and seeding rate for Owner review prior to application. Only proceed with hydroseeding after receiving Owner-permission.
  - 1. Mix slurry with fiber-mulch manufacturer's recommended tackifier.
  - 2. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than manufacturer's recommended rate, and seed component is deposited at not less than the specified seed-sowing rate.

## 3.6 SATISFACTORY SEEDED OR SODDED AREAS

- A. Satisfactory Seeded or Sodded Area: At end of maintenance period, a healthy, uniform, close stand of grass or sod has been established, free of weeds and surface irregularities.
- B. Re-establish seeded or sodded areas that do not comply with requirements and continue maintenance until seeded or sodded areas are satisfactory at no additional cost to the Owner.

## 3.7 PREPARATION AND CLEANUP INCLUDING MISCELLANEOUS ITEMS

- A. Promptly remove soil and debris created by seeding or sodding work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout the maintenance period and remove them after lawn is established.
- C. The entire project shall be prepared before the start of work and restored to original conditions upon completion of work. All restoration items not specifically listed for payment shall be included under the "Site Cleanup, Plantings, Landscaping and Site Restoration" Bid Item (if applicable). These items shall include, but are not limited to:
  - 1. Carefully removing existing landscaping materials, bagging the bulbs and trees and moving the materials to a safe storage location for replanting. Replanting and/or replacement shall be considered under this requirement.
  - 2. Removing, storing and resetting and/or replacing existing signage.
  - 3. Clearing and removing and/or trimming trees, brush and shrubs as required. In-kind replacement of shrubs shall be considered under this requirement.
  - 4. Restoration of all disturbed access areas shall be considered under this requirement.
  - 5. Removing, storing, and replacing lamp posts and/or any and all electrical fixtures and conduits.
  - 6. Resetting and/or replacing all other property improvements disturbed by construction.
  - 7. Maintenance and removal of all erosion and sediment control measures.
- D. The Contractor shall restore all disturbed areas including restoration in kind of all disturbed grass and lawn areas, shrubbery, walls, fences, treehouses, landscaping border, etc to an or equal or better condition. Grass and lawn areas shall be restored using four (4") of imported shredded topsoil and amended with spent mushroom soil compost.
- E. Mobilization and demobilization to the project, temporary facilities and site protection items shall be considered incidental to Bid Items of the Contractor's choosing. No payment will be considered for mobilization, etc.
- F. All removed material and/or structures shall be re-set in place as shown on the pre-construction photography and/or videography. Materials and/or structures that are damaged during removal shall be replaced with new materials and/or structures at no additional cost to the Municipality.

END OF SECTION 02920

## 02920 SITE RESTORATION

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## SECTION 02930 - PLANTS

## PART 1 - GENERAL

## 1.10 RELATED DOCUMENTS

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

## 1.11 SUMMARY

## A. Section Includes:

- 1. Plants.
- 2. Planting soil.
- 3. Tree stabilization.

## B. Related Sections:

- 1. Division 2 Section "Site Clearing" for topsoil stripping and stockpiling, and site clearing.
- 2. Division 2 Section "Temporary Tree and Plant Protection" for protection of existing trees.
- 3. Division 2 Section "Earthwork" for excavation, filling, and rough grading and for subsurface aggregate drainage and drainage backfill materials.

## 1.12 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.
- C. Balled and Potted Stock: Plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required.
- D. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than minimum root spread according to ANSI Z60.1 for type and size of plant required.

- E. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.
- F. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
- G. Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted plants established and grown in-ground in a porous fabric bag with well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of plant.
- H. Finish Grade: Elevation of finished surface of planting soil.
- I. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- J. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- K. Pests: Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- L. Planting Area: Areas to be planted.
- M. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- N. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.
- O. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots, the area of transition between the root system and the stem or trunk.
- P. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.
- Q. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.
- R. Subsoil: All soil beneath the topsoil layer of the soil profile and typified by the lack of organic matter and soil organisms.

- S. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

### 1.13 SUBMITTALS

- A. Product Data: For each type of product indicated, including soils.
1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
  2. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to the Project.
  3. Plant Photographs: Include color photographs in digital three (3")-inch by five (5")-inch print format of each required species and size of plant material as it will be furnished to the project. Take photographs from an angle depicting the true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than twenty (20) plants are required, include a minimum of three (3) photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.
- B. Samples for Verification: For each of the following:
1. Trees and Shrubs: Three (3) samples of each variety and size delivered to the site for review. Maintain approved samples on-site as a standard for comparison.
  2. Compost Mulch: One (1)-quart volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.
  3. Mineral Mulch: Five (5) pounds of each mineral mulch required, in sealed plastic bags labeled with source of mulch. Sample shall be typical of the lot of material to be delivered and installed on the site; provide an accurate indication of color, texture, and makeup of the material.
  4. Weed Control Barrier: Twelve (12")-inches by twelve (12")-inches.
  5. Edging Materials and Accessories: Manufacturer's standard size, to verify color selected.
  6. Root Barrier: Width of panel by twelve (12")-inches.
- C. Qualification Data: For qualified landscape Installer. Include a list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.
- D. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:
1. Manufacturer's certified analysis of standard products.
  2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

- E. Material Test Reports: For existing native surface topsoil, existing in-place surface soil and imported or manufactured topsoil.
- F. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before start of required maintenance periods.
- G. Warranty: Sample special warranty.

#### 1.14 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful establishment of plants.
  - 1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
  - 2. Experience: Three years' experience in landscape installation in addition to requirements in Division 01 Section "Quality Requirements." (if applicable).
  - 3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
  - 4. Personnel Certifications: Installer's personnel assigned to the Work shall have certification in all of the following categories from the Professional Landcare Network:
    - a. Certified Landscape Technician - Exterior, with installation and maintenance specialty area(s), designated CLT-Exterior.
    - b. Certified Landscape Technician - Interior, designated CLT-Interior.
    - c. Certified Ornamental Landscape Professional, designated COLP.
  - 5. Pesticide Applicator: State licensed, commercial.
- B. Soil-Testing Laboratory Qualifications: An independent or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.



- C. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of the soil.
1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
  2. The soil testing laboratory shall oversee soil sampling; with depth, location, and number of samples to be taken per instructions from Professional. A minimum of three (3) representative samples shall be taken from varied locations for each soil to be used or amended for planting purposes.
  3. Report on the suitability of tested soil for plant growth.
    - a. Based upon the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations regarding weight per cu. yd. for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
    - b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.
- D. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.
1. Selection of plants purchased under allowances will be made by Engineer who will tag plants at their place of growth before they are prepared for transplanting.
- E. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.
1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container grown stock. Measure the main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements six (6")-inches above the root flare for trees up to four (4")-inch caliper size, and twelve (12")-inches above the root flare for larger sizes.
  2. Other Plants: Measure with stems, petioles, and foliage in their normal position.
- F. Plant Material Observation: Engineer may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Engineer retains the right to observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from the project site.
1. Notify Engineer of sources of planting materials seven days in advance of delivery to site.
- G. Pre-installation Conference: Conduct conference at project site.

## 1.15 DELIVERY, STORAGE, AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.
- B. Bulk Materials:
  - 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
  - 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
  - 3. Accompany each delivery of bulk fertilizers, lime, and soil amendments with appropriate certificates.
- C. Deliver bare-root stock plants freshly dug. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.
- D. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.
- E. Handle planting stock by root ball.
- F. Store bulbs, corms, and tubers in a dry place at sixty (60) to sixty-five (65) degrees Fahrenheit until planting.
- G. Deliver plants after preparations for planting have been completed and install immediately. If planting is delayed more than six (6) hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.
  - 1. Heel-in bare-root stock. Soak roots that are in dry condition in water for two hours. Reject dried-out plants.
  - 2. Set balled stock on ground and cover the ball with soil, peat moss, sawdust, or other acceptable material.
  - 3. Do not remove container-grown stock from containers before the time of planting.
  - 4. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.

## 1.16 PROJECT CONDITIONS

- A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.
- B. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services or utilities according to requirements indicated:
  - 1. Notify the Owner, the Facility Owner, property owners, and the Engineer no fewer than three (3) days in advance of proposed interruption of each service or utility.
  - 2. Do not proceed with interruption of services or utilities without the Facility Owner's and the Owner's written permission.
- C. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from the date of Substantial Completion.
  - 1. Spring Planting: April 15 – May 31.
  - 2. Fall Planting: September 1 – November 1.
- D. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.
- E. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.
  - 1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

## 1.17 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.
    - b. Structural failures including plantings falling or blowing over.
    - c. Faulty performance of tree stabilization and edgings.
    - d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Periods from Date of Substantial Completion (or Final Completion as applicable):
  - a. Trees, Shrubs, Vines, and Ornamental Grasses: Twelve (12) months.
  - b. Ground Covers, Biennials, Perennials, and Other Plants: Twelve (12) months.
3. Include the following remedial actions as a minimum:
  - a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
  - b. Replace plants that are more than twenty-five (25%) percent dead or in an unhealthy condition at end of warranty period.
  - c. A limit of one (1) replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.
  - d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

#### 1.18 MAINTENANCE SERVICE

- A. Initial Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below. Provide maintenance at no additional cost to the Owner.
  1. Maintenance Period: Six (6) months from date of Substantial Completion (or Final Completion as applicable)
- B. Initial Maintenance Service for Ground Cover and Other Plants: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below. Provide maintenance at no additional cost to the Owner.
  1. Maintenance Period: Three (3) months from date of Substantial Completion (or Final Completion as applicable).
- C. Continuing Maintenance Proposal: From Installer to Owner, in the form of a standard yearly (or other period) maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options

## PART 2 - PRODUCTS

## 2.01 PLANT MATERIAL

- A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant Schedule or Plant Legend shown on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two (2) branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than three-quarter (3/4") inch in diameter; or with stem girdling roots will be rejected.
  2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.
- B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Professional, with a proportionate increase in size of roots or balls.
- C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- D. Labeling: Label at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant as shown on Drawings.
- E. If formal arrangements or consecutive order of plants are shown on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

## 2.02 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C 602, agricultural liming material containing a minimum of eighty (80%) percent calcium carbonate equivalent and as follows:
1. Class: T, with a minimum of ninety-nine (99%) percent passing through No. 8 sieve and a minimum of seventy-five (75%) percent passing through No. 60 sieve.
  2. Provide lime in form of ground calcitic limestone
- B. Sulfur: Granular, biodegradable, and containing a minimum of ninety (90%) percent sulfur, with a minimum of ninety-nine (99%) percent passing through No. 6 sieve and a maximum of ten (10%) percent passing through No. 40 sieve.

- C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of twenty (20%) percent iron and ten (10%) percent sulfur.
- D. Aluminum Sulfate: Commercial grade, unadulterated.
- E. Perlite: Horticultural perlite, soil amendment grade.
- F. Agricultural Gypsum: Minimum ninety (90%) percent calcium sulfate, finely ground with ninety (90%) percent passing through No. 50 sieve.
- G. Sand: Clean, washed, natural or manufactured, and free of toxic materials.
- H. Diatomaceous Earth: Calcined, ninety (90%) percent silica, with approximately one hundred forty (140%) percent water absorption capacity by weight.
- I. Zeolites: Mineral clinoptilolite with at least sixty (60%) percent water absorption by weight.

### 2.03 ORGANIC SOIL AMENDMENTS

- A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content thirty-five (35%) to fifty-five (55%) percent by weight; one hundred (100%) percent passing through 1/2-inch sieve; soluble salt content of five (5) to ten (10) decisiemens/m; not exceeding one-half (0.5%) percent inert contaminants and free of substances toxic to plantings; and as follows:
  - 1. Organic Matter Content: Fifty (50%) to sixty (60%) percent of dry weight.
  - 2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.
- B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or granular texture, with a pH range of 3.4 to 4.8.
- C. Muck Peat: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture, with a pH range of 6 to 7.5, and having a water-absorbing capacity of one thousand one hundred (1,100%) to two thousand (2,000%) percent.
- D. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.
  - 1. In lieu of decomposed wood derivatives, mix partially decomposed wood derivatives with ammonium nitrate at a minimum rate of 0.15 pounds per cubic foot of loose sawdust or ground bark, or with ammonium sulfate at a minimum rate of 0.25 pounds per cubic foot of loose sawdust or ground bark.
- E. Manure: Well-rotted, unleached, stable or cattle manure containing not more than twenty-five (25%) percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, debris, and material harmful to plant growth.

## 2.04 FERTILIZERS

- A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of one (1%) percent nitrogen and twenty (20%) percent phosphoric acid.
- B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of twenty (20%) percent available phosphoric acid.
- C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, fifty (50%) percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
  - 1. Composition: 1 pound per 1,000 square feet of actual nitrogen, four (4%) percent phosphorous, and two (2%) percent potassium, by weight.
  - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.
- D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of fifty (50%) percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
  - 1. Composition: Twenty (20%) percent nitrogen, ten (10%) percent phosphorous, and ten (10%) percent potassium, by weight.
  - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.
- E. Planting Tablets: Tightly compressed chip type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.
  - 1. Size: Ten (10)-gram tablets.
  - 2. Nutrient Composition: Twenty (20%) percent nitrogen, ten (10%) percent phosphorous, and five (5%) percent potassium, by weight plus micronutrients.
- F. Chelated Iron: Commercial-grade FeEDDHA for dicots and woody plants, and commercial-grade FeDTPA for ornamental grasses and monocots.

## 2.05 MULCHES

- A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:
  - 1. Type: Double shredded hardwood
  - 2. Color: Natural.

- B. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content thirty-five (35%) to fifty-five (55%) percent by weight; one hundred (100%) percent passing through 1-inch sieve; soluble salt content of 2 to 5 decisiemens/m; not exceeding one-half (0.5%) percent inert contaminants and free of substances toxic to plantings; and as follows:
1. Organic Matter Content: Fifty (50%) to Sixty (60%) percent of dry weight.
  2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

## 2.06 WEED CONTROL BARRIERS

- A. Non-woven Geotextile Filter Fabric: Polypropylene or polyester fabric, three (3) ounces per square yard, minimum, composed of fibers formed into a stable network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally encountered chemicals, alkalis, and acids.

## 2.07 PESTICIDES

- A. General: Pesticide registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.
- B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
- C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

## 2.08 TREE STABILIZATION MATERIALS

- A. Stakes and Guys:
1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood or softwood with wood pressure-preservative-treatment, free of knots, holes, cross grain, and other defects, two (2") by two (2")-inch nominal by length indicated, pointed at one end.
  2. Guys and Tie Wires: ASTM A 641/A 641M, Class 1, galvanized steel wire, two-strand, twisted, 0.106 inch in diameter.
  3. Tree-Tie Webbing: UV-resistant polypropylene or nylon webbing with brass grommets.
  4. Flags: Standard surveyor's plastic flagging tape, white, six (6")-inches long.



## 2.09 MISCELLANEOUS PRODUCTS

- A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.
- B. Burlap: Non-synthetic, biodegradable.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance.
  - 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
  - 2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
  - 3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
  - 4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Professional and replace with new planting soil.

### 3.02 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.
- B. Install 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.
- C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Professional's acceptance of layout before excavating or planting. Make minor adjustments as required.
- D. Lay out plants at locations directed by Engineer. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

- E. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.
  - 1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.
- F. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

### 3.03 PLANTING AREA ESTABLISHMENT

- A. Loosen subgrade of planting areas to a minimum depth of twelve (12") inches. Remove stones larger than one (1") inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
  - 1. Apply superphosphate fertilizer directly to subgrade before loosening.
  - 2. Thoroughly blend planting soil off-site before spreading.
    - a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
    - b. Mix lime with dry soil before mixing fertilizer.
  - 3. Spread planting soil to a depth of six (6") inches but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
    - a. Spread approximately one-half the thickness of planting soil over loosened subgrade. Mix thoroughly into top four (4") inches of subgrade. Spread the remainder of the planting soil.
- B. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.
- C. Before planting, obtain Professional's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

## 3.04 EXCAVATION FOR TREES AND SHRUBS

- A. Planting Pits and Trenches: Excavate circular planting pits with sides sloping inward at a forty-five (45) degree angle. Excavations with vertical sides are not acceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that the root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
1. Excavate approximately three times as wide as ball diameter for balled and burlapped or container-grown stock.
  2. Excavate at least twelve (12") inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
  3. Do not excavate deeper than the depth of the root ball, measured from the root flare to the bottom of the root ball.
  4. If the area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
  5. Maintain required angles of repose of adjacent materials as shown on the Drawings. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
  6. Maintain supervision of excavations during working hours.
  7. Keep excavations covered or otherwise protected when unattended by Installer's personnel.
  8. If drain tile is shown on Drawings or required under planting areas, excavate to top of porous backfill over tile.
- B. Subsoil and topsoil removed from excavations may not be used as planting soil.
- C. Obstructions: Notify Engineer if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
1. Hardpan Layer: Drill six (6") inch diameter holes, twenty-four (24") inches apart, into free-draining strata or to a depth of ten (10') feet, whichever is less, and backfill with free-draining material.
- D. Drainage: Notify Engineer if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.
- E. Fill excavations with water and allow them to percolate away before positioning trees and shrubs.

## 3.05 TREE, SHRUB, AND VINE PLANTING

- A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.
- B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting them cleanly; do not break.
- C. Set balled and burlapped or potted stock plumb and in center of planting pit or trench with root flare two (2") inches above adjacent finish grades.
  - 1. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
  - 2. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When the planting pit is approximately one-half filled, water thoroughly before placing the remainder of the backfill. Repeat watering until no more water is absorbed.
  - 3. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about one (1") inch from root tips; do not place tablets in bottom of the hole.
  - 4. Continue the backfilling process. Water again after placing and tamping the final layer of soil.
- D. When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

## 3.06 TREE, SHRUB, AND VINE PRUNING

- A. Remove only dead, dying, or broken branches. Do not prune for shape.
- B. Prune, thin, and shape trees, shrubs, and vines as directed by Engineer.
- C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Engineer, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.
- D. Do not apply pruning paint to wounds.

### 3.07 TREE STABILIZATION

- A. Install trunk stabilization as follows unless otherwise indicated:
1. Upright Staking and Tying: Stake trees of two (2")-inch through five (5")-inch caliper. Stake trees of less than two (2")-inch caliper only as required to prevent wind tip out. Use a minimum of two (2) stakes of length required to penetrate at least eighteen (18") inches below bottom of backfilled excavation and to extend one-third of trunk height above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
  2. Use two (2) stakes for trees up to twelve (12') feet high and two and one-half (2.5") inches or less in caliper; three (3) stakes for trees less than fourteen (14') feet high and up to four (4") inches in caliper. Space stakes equally around trees.
  3. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
  4. Support trees with two (2) strands of tie wire, connected to the brass grommets of tree-tie webbing at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
- B. Staking and Guying: Stake and guy trees more than fourteen (14') feet in height and more than three (3") inches in caliper unless otherwise indicated. Securely attach no fewer than three (3) guys to stakes thirty (30") inches long, driven to grade.
1. Site-Fabricated Staking-and-Guying Method:
    - a. For trees more than six (6") inches in caliper, anchor guys to wood deadmen buried at least thirty-six (36") inches below grade. Provide turnbuckle for each guy wire and tighten securely.
    - b. Support trees with bands of flexible ties at contact points with tree trunk and reaching to turnbuckle. Allow enough slack to avoid rigid restraint of tree.
    - c. Support trees with strands of cable or multiple strands of tie wire, connected to the brass grommets of tree-tie webbing at contact points with tree trunk and reaching to turnbuckle. Allow enough slack to avoid rigid restraint of tree.
    - d. Attach flags to each guy wire, thirty (30") inches above finish grade.
    - e. Paint turnbuckles with luminescent white paint.

### 3.08 PLANTING AREA MULCHING

- A. Install weed-control barriers before mulching according to manufacturer's written instructions. Completely cover area to be mulched, overlapping edges a minimum of twelve (12") inches and secure seams with galvanized pins.
- B. Mulch backfilled surfaces of planting areas and other areas indicated.
1. Trees and Tree-like Shrubs in Turf Areas: Apply mineral mulch ring of three (3")-inch average thickness, with thirty-six (36")-inch radius around trunks or stems. Do not place mulch within six (6") inches of trunks or stems.

### 3.09 PLANT MAINTENANCE

- A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.
- B. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
- C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.
- D. Provide maintenance at no additional cost to the Owner.

### 3.10 CLEANUP AND PROTECTION

- A. During planting, keep adjacent paving and construction clean and work area in an orderly condition.
- B. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.
- C. After installation and before Substantial Completion (or Final Completion as applicable), remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and project site.

### 3.11 DISPOSAL

- A. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property at no additional cost to the Owner.

END OF SECTION 02930

## SECTION 03300 - CAST-IN-PLACE CONCRETE

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings, Approved Permits, 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 specifies cast-in place concrete only for Base Bid – General Construction, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following (as applicable):
  - 1. Footings.
  - 2. Building or structures slabs-on-grade.
  - 3. Dek Hockey surface
- B. See applicable Architectural Sections and/or Plans for work conducted for building construction.

## 1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

## 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
  - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- D. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork.
  - 1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and installing and removing reshoring.

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03300 CAST-IN-PLACE CONCRETE

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- E. Welding certificates.
- F. Qualification Data: For Installer.
- G. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
  - 1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
- H. Material Certificates: For each of the following, signed by manufacturers:
  - 1. Cementitious materials.
  - 2. Admixtures.
  - 3. Form materials and form-release agents.
  - 4. Steel reinforcement and accessories.
  - 5. Waterstops.
  - 6. Curing compounds.
  - 7. Repair materials.
- I. Field quality-control test and inspection reports.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that 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."
- C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
  - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.
  - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.
- D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.



- E. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."
- F. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
  - 1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5.
  - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- G. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
- H. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

## 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 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
  - 1. Plywood, metal, or other approved panel materials.
  - 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
    - a. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
- 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.
  - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- C. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
  - 1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
  - 2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.
  - 3. Furnish ties with integral water-barrier plates to walls indicated to receive damp proofing or waterproofing.

## 2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.

## 2.4 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut bars true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
  - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
  - 2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

## 2.5 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
  - 1. Portland Cement: ASTM C 150, Type II, gray. Supplement with the following:
    - a. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Silica Fume: ASTM C 1240, amorphous silica.
- C. Normal-Weight Aggregates: ASTM C 33, Class 3S 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 Size: 3/4-inch nominal.
  - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Water: ASTM C 94/C 94M and potable.

## 2.6 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
  - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
  - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
  - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
  - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
  - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
  - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
- C. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.
  - 1. Available Products:
    - a. Grace Construction Products, W. R. Grace & Co.; DCI-S.
    - b. Master Builders, Inc.; Rheocrete 222+.
    - c. Sika Corporation; FerroGard-901.
    - d. Approved Equal.

## 2.7 WATERSTOPS

- A. Flexible PVC Waterstops: CE CRD-C 572, with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
  - 1. Manufacturers:
    - a. Greenstreak.
    - b. Meadows, W. R., Inc.
    - c. Tamms Industries, Inc.
- B. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, three-quarter (3/4")-inch by one (1")-inch.
  - 1. Available Products:
    - a. Colloid Environmental Technologies Company; Volclay Waterstop-RX.
    - b. Concrete Sealants Inc.; Conseal CS-231.
    - c. Greenstreak; Swellstop.
    - d. Henry Company, Sealants Division; Hydro-Flex.
    - e. JP Specialties, Inc.; Earthshield Type 20.
    - f. Progress Unlimited, Inc.; Superstop.
    - g. TCMiraDRI; Mirastop.
    - h. Approved Equal.

## 2.8 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
  - 1. Products:
    - a. ChemMasters; Spray-Film.
    - b. Euclid Chemical Company (The); Eucobar.
    - c. Kaufman Products, Inc.; Vapor Aid.
    - d. Meadows, W. R., Inc.; Sealtight Evapre.
    - e. Sika Corporation, Inc.; SikaFilm.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Sealer: Clear, Solvent-Borne, Membrane-Forming, Curing and Sealing Compound: ASTM C1315, Type 1, Class A.

## 2.9 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 per ASTM D 2240.
- C. 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 suit requirements, and as follows:
  - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

## 2.10 REPAIR MATERIALS

- A. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
  - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
  - 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
  - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
  - 4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

## 2.11 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
  - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
  - 1. Fly Ash: 25 percent.
  - 2. Combined Fly Ash and Pozzolan: 25 percent.
  - 3. Ground Granulated Blast-Furnace Slag: 50 percent.
  - 4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
  - 5. Silica Fume: 10 percent.
  - 6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

7. Combined Fly Ash or Pozzolans, Ground Granulated Blast-Furnace Slag, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
  1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.
  2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
  3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
  4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
- E. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

## 2.12 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings and Foundation Walls: Proportion normal-weight concrete mixture as follows:
  1. Minimum Compressive Strength: 4500 psi at 28 days.
  2. Maximum Water-Cementitious Materials Ratio: 0.45.
  3. Slump Limit: 4 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
  4. Air Content: 5.5 percent, plus or minus 1 percent at point of delivery for 3/4-inch nominal maximum aggregate size.
- B. Building or Structure (including Dek Hockey if applicable) Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:
  1. Minimum Compressive Strength: 4500 psi at 28 days.
  1. Maximum Water-Cementitious Materials Ratio: 0.45.
  2. Slump Limit: 4 inches, plus or minus 1 inch.
  3. Air Content: 5.5 percent, plus or minus 1 percent at point of delivery for 3/4-inch nominal maximum aggregate size.

## 2.13 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

## 2.14 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
  - 1. When the air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Not Permitted

## PART 3 - EXECUTION

## 3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
  - 1. Class A, 1/8 inch for smooth-formed finished surfaces.
  - 2. Class B, 1/4 inch for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
  - 1. Install keyways, reglets, recesses, and the like, for easy removal.
  - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

### 3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
  - 2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
  - 3. Install dovetail anchor slots in concrete structures as indicated.

### 3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 48 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.
  - 1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
  - 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Engineer.



### 3.4 SHORES AND RESHORES

- A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.
  - 1. Do not remove shoring or reshoring until the measurement of slab tolerances is complete.
- B. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

### 3.5 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
  - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurate position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
  - 1. Weld reinforcing bars according to AWS D1.4, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

### 3.6 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Engineer.
  - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
  - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
  - 3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
  - 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
  - 5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
  - 6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
  - 7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-third of concrete thickness as follows:
  - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
  - 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
  - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
  - 2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Division 7 Section "Joint Sealants," are indicated.
  - 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

### 3.7 WATERSTOPS

- A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Installation in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.
- B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

### 3.8 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Engineer.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
  - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
  - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
  - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
  - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
  - 4. Do not allow concrete to fall/drop uncontrolled more than four (4') feet.

- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  2. Maintain reinforcement in position on chairs during concrete placement.
  3. Screed slab surfaces with a straightedge and strike off to correct elevations.
  4. Slope surfaces uniformly to drains where required.
  5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. 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 average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
  2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- G. Hot-Weather Placement: Comply with ACI 301 and as follows:
1. 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. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

### 3.9 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces not exposed to view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces to receive a rubbed finish.

- C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where exposed to view:
  - 1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

### 3.10 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
  - 1. Apply a trowel finish to surfaces indicated, exposed to view, or be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
  - 2. Finish surfaces to the following tolerances, according to ASTM E 1155, for a randomly trafficked floor surface:
    - a. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.
  - 3. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-foot-long straightedge resting on 2 high spots and placed anywhere on the surface does not exceed 1/8 inch
- C. Broom Finish: Apply a broom finish to concrete walking surfaces, steps, and ramps, and elsewhere as indicated.
  - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with the Engineer before application.
- D. Slope all slabs to floor drains (if present). Slope exterior slabs to shed water.

### 3.11 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after the work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

### 3.12 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x 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.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before the end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during the curing period using cover material and waterproof tape.
  - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
  - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
  - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.
2. Floors to Receive Curing and Sealing Compound:
  - a. Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller in accordance with manufacturer's written instructions.
  - b. Recoat areas subjected to heavy rainfall within three hours after initial application.
  - c. Repeat the process 24 hours later, and apply a second coat. Maintain continuity of coating, and repair damage during curing period.

### 3.13 APPLICATION OF LIQUID FLOOR TREATMENTS

- A. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller in accordance with manufacturer's written instructions.

### 3.14 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
  1. Defer joint filling until concrete has aged at least **one** month. Do not fill in joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

## 3.15 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Engineer. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.
- B. Patching Mortar: Mix dry pack patching mortar, consisting of one-part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
  - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension in solid concrete, but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
  - 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
  - 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Engineer.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
  - 1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
  - 2. After concrete has cured at least 14 days, correct high areas by grinding.
  - 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing them with patching mortar. Finish repaired areas to blend into adjacent concrete.
  - 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
  - 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.



6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of the same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
  7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove the top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Engineer's approval.

### 3.16 FIELD QUALITY CONTROL

- A. Testing and Inspecting: The Contractor shall engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- B. Inspections:
1. Steel reinforcement placement.
  2. Steel reinforcement welding.
  3. Headed bolts and studs.
  4. Verification of use of required design mixture.
  5. Concrete placement, including conveying and depositing.
  6. Curing procedures and maintenance of curing temperature.
  7. Verification of concrete strength before removal of shores and forms from beams and slabs.
- C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
  2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
  3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M.
  - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
  - b. Cast and field cure three sets of two standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
  - a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
  - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
7. When the strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
9. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
10. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.
11. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Engineer.
12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
13. Correct deficiencies in the Work that test reports and inspections indicate does not comply with the Contract Documents.

END OF SECTION 03300

# ATTACHMENTS

# Contract No. 1 – General Construction Schedule of Values (SOV)

| The Gateway Engineers, Inc.<br>100 McMorris Road<br>Pittsburgh, PA 15205 |                                                                                     | <b>Contract No. 1 - General Construction</b><br><b>SOV - Base Bid</b> |            | Project No. C-90049-B001<br>Date June 16, 2025<br>Amount                         |        |
|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------|----------------------------------------------------------------------------------|--------|
| Estimate of Cost For Work To Be Completed In Project                     |                                                                                     |                                                                       |            | <b>Municipality of Bethel Park, Allegheny Co</b><br><b>Miner's Park Restroom</b> |        |
| ITEM NO.                                                                 | DESCRIPTION                                                                         | UNIT                                                                  | UNIT PRICE | QUANTITY                                                                         | AMOUNT |
|                                                                          | <b>Clearing and Grubbing / Site Demolition / Site Protection / Utility Location</b> |                                                                       |            |                                                                                  |        |
|                                                                          | Remove Concrete Sidewalk                                                            | S.F.                                                                  |            | 455                                                                              |        |
|                                                                          | Tree Protection (Temporary Orange Construction Fencing)                             | L.S.                                                                  |            | 1                                                                                |        |
|                                                                          | Site Protection (Including Site Access and Features to Remain Along Access)         | L.S.                                                                  |            | 1                                                                                |        |
|                                                                          | Locate Existing Utilities Using GPR                                                 | L.S.                                                                  |            | 1                                                                                |        |
|                                                                          | <b>Erosion and Sediment Control</b>                                                 |                                                                       |            |                                                                                  |        |
|                                                                          | Inlet Protection                                                                    | EA.                                                                   |            | 2                                                                                |        |
|                                                                          | 12" Compost Filter Sock                                                             | L.F.                                                                  |            | 300                                                                              |        |
|                                                                          | Concrete Washout                                                                    | EA.                                                                   |            | 1                                                                                |        |
|                                                                          | Rock Construction Entrance (RCE) w/ Maintenance Stockpile                           | EA.                                                                   |            | 1                                                                                |        |
|                                                                          | NAG SC 150 ECB                                                                      | S.Y.                                                                  |            | 115                                                                              |        |
|                                                                          | E and SC Maintenance and Removal                                                    | L.S.                                                                  |            | 1                                                                                |        |
|                                                                          | <b>Site Improvements</b>                                                            |                                                                       |            |                                                                                  |        |
|                                                                          | Seeding / Mulching (All Other Disturbed Areas)                                      | L.S.                                                                  |            | 1                                                                                |        |
|                                                                          | Standard Duty Concrete Pavement (Including ADA Ramp)                                | S.F.                                                                  |            | 455                                                                              |        |
|                                                                          | Bituminous Trench Repair                                                            | S.Y.                                                                  |            | 15                                                                               |        |
|                                                                          | Commonweath of Pennsylvania Funding Sign                                            | L.S.                                                                  |            | 1                                                                                |        |
|                                                                          | <b>Earthwork</b>                                                                    |                                                                       |            |                                                                                  |        |
|                                                                          | Strip / Stockpile / Haul Off Excess Topsoil                                         | L.S.                                                                  |            | 1                                                                                |        |
|                                                                          | Import / Place Shredded Topsoil                                                     | L.S.                                                                  |            | 1                                                                                |        |
|                                                                          | Unclassified Bulk Excavation (Site including Building, Etc.)                        | L.S.                                                                  |            | 1                                                                                |        |
|                                                                          | Haul Off Excess Unclassified Bulk Exc                                               | L.S.                                                                  |            | 1                                                                                |        |
|                                                                          | <b>Storm Sewer</b>                                                                  |                                                                       |            |                                                                                  |        |
|                                                                          | 6" Perforated SLCPP Drain                                                           | L.F.                                                                  |            | 100                                                                              |        |
|                                                                          | 6" End Section with Rip Rap Apron                                                   | L.S.                                                                  |            | 1                                                                                |        |
|                                                                          | <b>New Building</b>                                                                 |                                                                       |            |                                                                                  |        |
|                                                                          | Restroom Building                                                                   | L.S.                                                                  |            | 1                                                                                |        |
|                                                                          | <b>Site Restoration; Site Protection; Project Coordination; Project Costs</b>       | L.S.                                                                  |            | 1                                                                                |        |

**Note:** Bidders for Contract No. 1 acknowledge that each Bid Unit price shown on the "Schedule of Values" includes an amount considered by the Bidder to be adequate to cover the overhead and profit for each separately identified item. Bidder acknowledges that estimated quantities are not guaranteed, and are solely for comparison of Bids, and final payment for all Bid Items will be based on **actual installed** quantities, determined as provided in the Contract Documents.

**Note:** Bidders for Contract No. 1 acknowledge that the Municipality reserves the right to increase or decrease listed "Schedule of Value" quantities (including elimination of quantities in their entirety) without consideration for recovery of any or all direct or indirect costs (including overhead and profit) associated with the adjusted or eliminated quantity subject to all Sections of this Document.

**Note:** Bidders for Contract No. 1 are advised that the total listed on the SOV must correspond to the total bid for Contract No. 1 for the bid to be considered as **responsive**. The Owner reserves the right to resolve informalities between the SOV and the Total Base Bid on the Bid Form and Proposal at its sole discretion.

Note: The completed "Contract No. 1 SOV" must be attached to Bid for the Bid to be considered as **responsive**.

**Note:** Bidders shall bring quantity discrepancies to the Engineer's attention **prior** to Bid placement.

The successful Bidder will be required to provide detailed Schedule of Values for all major "lump sum" items above (Building and Site Restoration...Project Costs) as part of the **submittal process**.

Contract No. 1 GC - Base Bid Total

Exhibit A –  
Nondiscrimination/Sexual  
Harrasment

**EXHIBIT A:**

**NONDISCRIMINATION/SEXUAL HARASSMENT**

- a. **Representations.** The Grantee represents that it is presently in compliance with and will remain in compliance with all applicable federal, state, and local laws, regulations, and policies relating to nondiscrimination and sexual harassment for the term of the agreement. The Grantee shall, upon request and within the time periods requested by the Commonwealth, furnish all necessary employment documents and records, including EEO-1 reports, and permit access to its books, records, and accounts by the Commonwealth for the purpose of ascertaining compliance with provisions of this Nondiscrimination/Sexual Harassment Clause.
- b. **Nondiscrimination/Sexual Harassment Obligations.** The Grantee shall not:
- i. in any manner discriminate in the hiring of any employee(s) for the performance of the activities required under this agreement or any subgrant agreement, contract, or subcontract, by reason of race, gender, creed, color, sexual orientation, gender identity or expression, or in violation of the Pennsylvania Human Relations Act ("PHRA") and applicable federal laws, against any citizen of this Commonwealth who is qualified and available to perform the work to which the employment relates.
  - ii. in any manner discriminate by reason of race, gender, creed, color, sexual orientation, gender identity or expression, or in violation of the PHRA and applicable federal laws, against or intimidate any of its employees.
  - iii. in any manner discriminate by reason of race, gender, creed, color, sexual orientation, gender identity or expression, or in violation of the PHRA and applicable federal laws, in the provision of services under this agreement or any subgrant agreement, contract, or subcontract.
  - iv. in any manner discriminate by reason of race, gender, creed, color, sexual orientation, gender identity or expression, or in violation of PHRA and applicable federal laws, against any subgrantee, contractor, subcontractor, or supplier who is qualified to perform the work to which this agreement relates.

- v. in any manner discriminate against employees by reason of participation in or decision to refrain from participating in labor activities protected under the Public Employee Relations Act, Pennsylvania Labor Relations Act, or National Labor Relations Act, as applicable, and to the extent determined by entities charged with the Acts' enforcement and shall comply with any provision of law establishing organizations as employees' exclusive representatives.
- c. **Establishment of Grantee Policy.** The Grantee shall establish and maintain a written nondiscrimination and sexual harassment policy that complies with the applicable law and these Nondiscrimination/Sexual Harassment provisions and shall inform its employees in writing of the policy. The policy must contain a provision that states that sexual harassment will not be tolerated and employees who practice it will be disciplined. For the entire period of this agreement, the Grantee shall: (1) post its written nondiscrimination and sexual harassment policy or these Nondiscrimination/Sexual Harassment provisions conspicuously in easily accessible and well-lighted places customarily frequented by employees at or near where the grant activities are performed; or (2) provide electronic notice of the policy or this clause to its employees not less than annually.
- d. **Notification of Violations.** The Grantee's obligations pursuant to these provisions are ongoing from the effective date and through the termination date of the agreement. Accordingly, the Grantee shall notify the Commonwealth if, at any time during the term of this agreement, it becomes aware of any actions or occurrences that would result in violation of these provisions.
- e. **Cancellation or Termination of Agreement.** The Commonwealth may cancel or terminate this agreement and all money due or to become due under this agreement may be forfeited for a violation of the terms and conditions of these Nondiscrimination/Sexual Harassment provisions. In addition, the granting agency may proceed with debarment or suspension and may place the Grantee in the Contractor Responsibility File.
- f. **Subgrant Agreements, Contracts, and Subcontracts.** The Grantee shall include these Nondiscrimination/Sexual Harassment provisions in its subgrant agreements, contracts, and subcontracts with all subgrantees, contractors, and subcontractors providing goods or services under this agreement. The incorporation of these provisions in the Grantor's subgrants, contracts, or subcontracts does not create privity of contract between the Commonwealth and any subgrantee, contractor, or subcontractor, and no third-party beneficiaries are created by those provisions. If the Grantee becomes aware of a subgrantee's, contractor's, or subcontractor's violation of these provisions, the Grantee shall use its best efforts to ensure the subgrantee's, contractor's, or subcontractor's compliance with these provisions.