CANONSBURG PARK
PAVILION SITE DEVELOPMENT
LOCATED IN
CANONSBURG BOROUGH
WASHINGTON COUNTY, PENNSYLVANIA

CONTRACT DOCUMENTS
FOR THE
CONSTRUCTION OF

CANONSBURG PARK
PAVILION SITE DEVELOPMENT
Canonsburg Borough
Washington County, Pennsylvania

Contract No. 4117-CE-19

NOVEMBER 2019

PREPARED BY:

61 EAST WHEELING STREET
WASHINGTON, PA 15301
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FAX: 724-228-7057
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ADVERTISEMENT FOR BIDS

Sealed proposals for the **Canonsburg Park Pavilion Site Development** shall be received by the **Friends of Canonsburg Town Park** at the Canonsburg Municipal Building located at 68 East Pike Street, Canonsburg, Pennsylvania, 15317, until **4:00 PM local prevailing time on December 16, 2019** for furnishing labor, materials, and performing all work set forth in the advertisement, general conditions, drawings, and specifications.

The bids will be publicly opened and read aloud at the Canonsburg Municipal Building Council Chambers at 68 East Pike Street, Canonsburg, Pennsylvania, 15317 at 7:00 PM on December 16, 2019 during the Canonsburg Park Board Meeting and acted upon at that time.

The work will consist of site grading, concrete slab, concrete sidewalk, electrical connections, water connections, stone post surrounds and final site grading and seeding.

Proposals must be on the forms furnished by the Engineer. Each proposal shall be accompanied by security in the form of a certified check or bid bond payable to the order of the **Friends of the Canonsburg Town Park** in the amount not less than ten percent (10%) of the total bid in accordance with provisions of the Contract Documents.

Upon successful award of the contract to the lowest responsible bidder, a 100% performance bond, 100% payment bond, and 100% maintenance bond are required.

Copies of the contract documents including drawings, technical specifications, and bid forms are available at no cost via download from the Widmer Engineering Inc. website at https://widmerengineering.com under “Bids”. Questions should be directed to Widmer Engineering Inc. at 724-228-1550.

Bids, whether mailed or delivered in person, shall be sealed, and marked "**Friends of the Canonsburg Town Park – Canonsburg Park Pavilion Site Development**" and addressed to **Friends of the Canonsburg Town Park at 68 East Pike Street, Canonsburg, Pennsylvania, 15317**.

The successful bidder must carry insurance with financially responsible insurance companies licensed in the Commonwealth of Pennsylvania and approved by the Friends of the Canonsburg Town Park and shall be kept in force until the successful bidder’s work is accepted by the Friends of the Canonsburg Town Park. Contracts of insurance which expire before the Friends of the Canonsburg Town Park accepts the successful bidder’s work shall be renewed and evidence of such renewal shall be submitted to the Friends of the Canonsburg Town Park for approval.

**Pennsylvania Prevailing Wage Rates** will apply to this project.

Attention is directed to the fact that not less than the minimum salaries and wages as set forth in the Contract Documents must be paid on this project; that the Contractor must ensure that employees and applicants for employment are not discriminated against because of their race, color, religion, sex, national origin or handicap; that a mandatory ratio of apprentices and trainees to journeymen is required in each craft and that the Contractor (and any subcontractor) is obliged to make a “diligent effort” to achieve these ratios.

No bids shall be withdrawn for a period of sixty (60) days after the time set for the opening of bids.
Bids may be held by the Friends of the Canonsburg Town Park for a period of sixty (60) days from the date of opening of bids for the purpose of reviewing bids and investigating the qualifications of bidders prior to awarding the Contract.

The Friends of the Canonsburg Town Park reserves the right to reject any part of or all proposals, or to waive any irregularity in the proposal when the Friends of the Canonsburg Town Park deems such action advantageous to the Friends of the Canonsburg Town Park

Friends of the Canonsburg Town Park

Ms. Terri J. Startare

Advertised Dates: November 27, 2019
INSTRUCTIONS TO BIDDERS

1. **Scope of Work:**

   Bidders are invited to submit itemized price proposals for furnishing all work shown on the Drawings and described in the Specifications for the following project:

   **Canonsburg Park Pavilion Site Development** includes the installation of site work, concrete pad, concrete sidewalk, electrical connections, drinking fountain installation, stone work and installation of storage shed.

2. **Bid and Contracts:**

   a. Bids must be sealed and addressed to:

      **Friends of the Canonsburg Town Park**
      68 East Pike Street
      Canonsburg, PA 15317

      Identify on the envelope the project for which the bid is being submitted. Each bid must be submitted on the forms furnished to the bidders. Bids submitted after the bid closing time will not be accepted.

   b. Contracts: The successful bidder will be required to execute the contract for construction and return the contract accompanied by the Performance Bond, Payment Bond, Maintenance Bond, and Insurance Certificates herein described, within **ten (10) calendar days** after the documents are presented to him.

   c. Corrections: Erasures or other changes in the bid must be explained or noted over the signature of bidder.

   d. Withdrawal of Bids: Bids may be withdrawn on written or telegraphic requests received from bidder prior to the time fixed for opening. A bidder may also withdraw his bid providing he does so according to Pennsylvania law.

3. **Bid Security:**

   A bid security in an amount equal to at least ten percent (10%) of the bid shall be submitted with each bid. This shall be in the form of a certified check, or bid bond with good and sufficient surety. The payee in any instance shall be:

   **Friends of the Canonsburg Town Park**

   Bid securities will be returned to all except the three (3) lowest bidders for the contract immediately after the bid opening and the remaining bid securities will be returned when the executed contract is delivered to the successful bidder.
4. **Investigation of Conditions and Errors in Bid:**

   a. It is required that the bidder visit the site and acquaint themselves with all available information concerning the condition of the site, the availability of labor, and the local conditions having a bearing on the transporting, handling, and storing of materials and equipment.

   b. Bidders or their authorized agents are expected to examine the drawings, specifications, schedules, and all other instructions pertaining to the work which are supplied with this project.

   c. Failure to acquaint himself with all available information concerning the existing conditions will not relieve the successful bidder of the responsibility for estimating the difficulties. Completion of the work consists of successfully performing the work as required, and he cannot secure relief on the pleas of error in his bid.

   d. **Friends of the Canonsburg Town Park** hereinafter referred to as the Owner, reserves the right to waive minor irregularities or minor errors in any proposal, if it appears to the Owner that such irregularities or errors were made through inadvertence. Any such irregularities or errors so waived must be corrected on the proposal in which they occur prior to the execution of any contract which may be awarded thereon.

5. **Method of Award or Rejection of Bids:**

   a. If bids received are determined by the Owner to be satisfactory, contracts will be awarded to the lowest responsible bidders within Sixty (60) days after the date of opening proposals.

   b. The contract will be awarded to the lowest responsible bid conforming to the contract documents, whichever is most advantageous to the Owner, price and other factors considered.

   c. Should such successful bidders fail or refuse to execute a contract and to furnish satisfactory contract security within ten (10) days after a written notification of the award of the contract by the Owner, the bidder shall be considered to have abandoned the proposal and the amount of the certified check or other security delivered with the proposal shall thereupon be due and owing to the Owner as liquidated damages for such failure or refusal and the Owner may thereupon award the contract to any other bidder. The term "successful bidder" shall be deemed to include any bidder whose proposal is accepted after another bidder has previously refused or been unable to execute the contract or to furnish satisfactory contract security.

   d. The Owner reserves the right to accept or reject any or all proposals as may be deemed in the best interest of the Owner.
6. **Time of Performance:**

   Work shall commence within ten (10) calendar days after the date of "Notice to Proceed" and the contractor shall fully complete all the work within the time stated and under the conditions enumerated in the contract agreement.

7. **Federal Occupational Safety and Health Act:**

   The bidders' attention is called to Special Conditions Section of the Specification which concerns compliance with the Federal Occupational Safety and Health Act of 1970.

8. **Equal Employment Opportunity:**

   Attention of bidders is particularly called to the requirement for ensuring the employees and applicants for employment are not discriminated against because of their race, creed, color or national origin.

9. **Permits:**

   It shall be the responsibility of the contractor to secure all necessary permits required by all government agencies for all work performed under this contract.

10. **Subcontracts:**

    The bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a subcontract under this contract must be acceptable to the Owner.

11. **Guarantees:**

    The following guarantees shall be required.

    a. A Performance Bond with good and sufficient surety or sureties for the protection of the Owner, shall be executed in a penal amount of one hundred percent (100%) of the contract price.

    b. A Payment Bond with good and sufficient surety or sureties for the protection of persons furnishing material and labor of the work shall be executed in a penal amount of one hundred percent (100%) of the contract price.

    c. In addition to the contract security noted above, a Maintenance Bond with good and sufficient surety or sureties in a penal amount of one hundred percent (100%) of the contract price and shall guarantee against defective or inferior materials or workmanship which may develop during the period of two (2) years from the date of the completion and acceptance of work performed under each contract.
CORPORATE CERTIFICATE

I, ________________________________, certify that I am the Secretary of the Corporation named as Contractor in the foregoing Instrument; that ___________________________ who signed the said Instrument on behalf of the Contractor was then ____________________ of said Corporation; that said Contract was duly signed for and in behalf of said Corporation by authority of its governing body, and is within the scope of its corporate power.

_________________________________

(Corporate Seal)
FORM OF PROPOSAL
CANONSBURG BOROUGH
WASHINGTON COUNTY, PENNSYLVANIA
FOR THE
CANONSBURG PARK PAVILION SITE DEVELOPMENT

PROPOSAL OF ____________________________________________ (hereinafter called "BIDDER") organized and existing under the laws of the State of ____________, doing business as a(n) ________________, (corporation, partnership, or individual), to FRIENDS OF CANONSBURG TOWN PARK (hereinafter called "OWNER"). In compliance with your advertisement for bids, BIDDER hereby proposes to perform all work described within the bid schedule in strict accordance with the time set forth herein, and at the prices stated herein. That herein is a "RESPONSIBLE BIDDER" and having carefully examined the bid documents and project area of the Owner, and being fully informed in regard to the conditions to be met in the work, the undersigned proposes to perform all work related to and covered by the specifications.

BIDDER hereby agrees to perform all the work in the contract documents for the following prices and to hold said bid for a period of sixty (60) days after the opening date.

BIDDER hereby agrees to begin work within ten (10) days after the receipt of the “NOTICE TO PROCEED” and to complete the project within one hundred and eighty (180) calendar days thereafter (including ordering of equipment period). If said contract is not substantially completed within the time frame specified, then the BIDDER shall reimburse the OWNER at a rate of $1,000.00/day for each calendar day thereafter that said project is not complete, including all punch list items as prepared by the OWNER’s representative.

In submitting this bid, the BIDDER understands that the right is reserved by the OWNER to reject any or all bids. If written notice of the acceptance of this bid is mailed, telegraphed or delivered, in writing, to the undersigned within sixty (60) days after the opening thereof, or at any time thereafter before this bid is withdrawn, the undersigned agrees to execute and deliver an agreement in the prescribed form and furnish the required bonds within ten (10) days after the agreement is presented to him for signature.

Security in the amount of ____________________________________________

___________________________________________________________________ Dollars ($______________), 
in the form of ___________________________ is submitted herewith in accordance with the INSTRUCTIONS TO BIDDERS.

The Bidders hereby acknowledges receipt of the following issues of addenda, if any, distributed by the engineer.

Addendum No. __________________________ Date____________
Addendum No. __________________________ Date____________
Addendum No. __________________________ Date____________
In submitting this bid, the BIDDER hereby certifies 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 contractor, bidder or potential bidder.

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 bid.

5). The bidder its affiliates, subsidiaries, 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:

The undersigned bidder is prepared to submit a financial and experience statement upon request by the Owner.

(If an individual, partnership, or non-incorporated organization)

Signature of Bidder______________________________________________________________

By___________________________________________________________________________

Address of Bidder_______________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

Names and Addresses of Members of firm:

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________
(If a Corporation)

Signature of Bidder_____________________________________________________________

By___________________________________________________________

Business Address___________________________________________________________

Incorporated under the laws of the State of________________________________________

Names of Officers:

President___________________________________________________________

Address___________________________________________________________

Secretary___________________________________________________________

Address___________________________________________________________

Treasurer___________________________________________________________

Address___________________________________________________________

Total price written in words_______________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________.

The above price shall include all labor, material, equipment, overhead, profit, insurance, etc. to cover the finished work.

Items to be submitted with bid:

1. Form of Proposal
2. Non-Collusion Affidavit
3. Bid Bond in the amount of 10% of bid.
4. Addenda (if any)

The owner reserves the right to accept or reject all or any part of a bid or to reject all bids.
# CANONSBURG PARK PAVILION SITE DEVELOPMENT

4117-CE-19

CANONSBURG BOROUGH

WASHINGTON COUNTY, PENNSYLVANIA

## LIST OF QUANTITIES

November 27, 2019

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Total For Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mobilization</td>
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<td>LSUM</td>
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</tr>
<tr>
<td>2</td>
<td>Site Grading &amp; Earthwork</td>
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<td>LSUM</td>
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</tr>
<tr>
<td>3</td>
<td>Pavilion Pad</td>
<td>96</td>
<td>SYD</td>
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<tr>
<td>4</td>
<td>4” Thick Access Ramps</td>
<td>73</td>
<td>SYD</td>
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<td>5</td>
<td>Parking Lot Restoration</td>
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<tr>
<td>6</td>
<td>Concrete Curb Stops</td>
<td>2</td>
<td>EA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Line Painting</td>
<td>1</td>
<td>LSUM</td>
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</tr>
<tr>
<td>8</td>
<td>Topsoil Placement, Seed and Mulch</td>
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<td>LSUM</td>
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</tr>
<tr>
<td>9</td>
<td>Soil Erosion and Sedimentation Controls</td>
<td>1</td>
<td>LSUM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL =**

**TOTAL BID AMOUNT:**

(printf or type amount using alphabetical letters)

## NOTES:

1. Unit pricing to include all project management, supervision, bonding, construction stake out, materials, labor, temporary utilities, traffic control and all other items required to perform the specified work.
2. Contractor shall be responsible for disposal of all excavated material to an approved location.
3. Item No. 3 shall include fine grading, aggregate, concrete, reinforcement and all necessary items to complete concrete pad.
4. Item No. 4 shall include fine grading, framing, aggregate, concrete, reinforcement and all necessary items to complete concrete access ramps.

TOTAL BASE BID AMOUNT:

(Print or Type amount using alphabetical letters)

(Print or Type amount using numerical figures)

Name/Company                        Date

Signature                            Printed Name
### ALTERNATE BID 1: DRINKING FOUNTAIN INSTALLATION

November 27, 2019

<table>
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<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Total For Item</th>
</tr>
</thead>
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<tr>
<td>1</td>
<td>Drinking Fountain</td>
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<tr>
<td>2</td>
<td>Waterline Connection</td>
<td>1</td>
<td>LSUM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Meter Installation</td>
<td>1</td>
<td>LSUM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL=**

**NOTES:**
1. Unit pricing to include all project management, supervision, bonding, construction stake out, materials, labor, temporary utilities, traffic control and all other items required to perform the specified work.
2. Contractor shall be responsible for disposal of all excavated material to an approved location.
3. Item No. 1 shall include all items necessary to supply and install drinking fountain as specified on Plan Sheet.
4. Item No. 2 shall include all items necessary to connection drinking fountain to water service from main water lateral to the drinking fountain location.
5. Item No. 3 shall include all items necessary to re-locate water meter from existing pool house to a location before the proposed drinking fountain service connection.

### ALTERNATE BID 2: LIGHTING

November 27, 2019

<table>
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<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Total For Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lighting Fixtures within Pavilion</td>
<td>X</td>
<td>EA</td>
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<td></td>
</tr>
<tr>
<td>2</td>
<td>Electrical Outlets</td>
<td>6</td>
<td>EA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Electrical Connection to Pavilion Structure</td>
<td>1</td>
<td>LSUM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL=**

**NOTES:**
1. Unit pricing to include all project management, supervision, bonding, construction stake out, materials, labor, temporary utilities, traffic control and all other items required to perform the specified work.
2. Contractor shall be responsible for disposal of all excavated material to an approved location.
3. Item No. 1 shall include all items necessary to supply and install lighting fixtures within pavilion as designated on Plan Sheet.
4. Item No. 2 shall include all items necessary to supply and install weatherproof electrical outlets within Pavilion as designated on Plan Sheet.
5. Item No. 3 shall include all items necessary installation site meter and electrical connection from existing electrical pole to pavilion via *overhead service.*
ALTERNATE BID 3: STORAGE SHED  
November 27, 2019

<table>
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<tr>
<th>Item</th>
<th>Description</th>
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<th>Unit</th>
<th>Unit Price</th>
<th>Total For Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stone Base Pad</td>
<td>120</td>
<td>SQFT</td>
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</tr>
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<td>2</td>
<td>8’ x 10’ Quake Style Storage Shed</td>
<td>1</td>
<td>LSUM</td>
<td></td>
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<tr>
<td>3</td>
<td>Electrical Service</td>
<td>1</td>
<td>LSUM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL=

NOTES:
1. Unit pricing to include all project management, supervision, bonding, construction stake out, materials, labor, temporary utilities, traffic control and all other items required to perform the specified work.
2. Contractor shall be responsible for disposal of all excavated material to an approved location.
3. Item No. 1 shall include all items necessary to install stone base pad as designated on Plan Sheet.
4. Item No. 2 shall include all items necessary to supply and install Quake Style Storage Shed as specified on Plan Sheet.
5. Item No. 3 shall include all items necessary to supply and install electrical service, lighting and outlets into the storage shed as shown on the Plan Sheet.

ALTERNATE BID 4: PAVILION STONE COLUMNS  
November 27, 2019

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Total For Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stone Column Surrounds</td>
<td>10</td>
<td>EA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL=

NOTES:
1. Unit pricing to include all project management, supervision, bonding, construction stake out, materials, labor, temporary utilities, traffic control and all other items required to perform the specified work.
2. Contractor shall be responsible for disposal of all excavated material to an approved location.
3. Item No. 1 shall include all items necessary to install stone column surround per specifications on Plan Sheet.
NON-COLLUSION AFFIDAVIT OF PRIME BIDDER

State of ______________________

SS:

County of _____________________

_________________________________________ being first duly sworn according to law, deposes and says as follows:

(1) He is _________________________ of ________________________________, the bidder that has submitted the attached bid;

(2) He is fully informed respecting the preparation and contents of the attached bid and of all pertinent circumstances respecting such bid;

(3) Such bid is genuine and is not a collusive or sham bid;

(4) Neither the said bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other bidder, firm or person to submit a collusive or sham bid in connection with the contract for which the attached bid has been submitted or to refrain from bidding in connection with such contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other bidder, firm or person to fix the price or prices in the attached bid or of any other bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement, any advantage against the ________________, or any person interested in the proposed contract; and

(5) The price or prices quoted in the attached bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the bidder of any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

_________________________________________

By ___________________________

______________________________

Bidder

Sworn to and subscribed before me this ________________ day of ________________________, 20__.

______________________________

Notary Public

My commission expires:_________________________
NON-COLLUSION AFFIDAVIT OF SUBCONTRACTOR

State of ______________________

County of _____________________

_________________________________________ being first duly sworn according to law, deposes and says that:

(1) He is (Owner, partner, officer, representative, or agent of _________________________ hereinafter referred to as the “Subcontractor”;

(2) He is fully informed respecting the preparation and contents of the Subcontractor’s Proposal submitted the subcontractor to ____________________, the Contractor for certain work in connection with the _______________________ Contract pertaining to the Project in _________________________ (City or County and State).

(3) Such subcontractor’s proposal is genuine and is not a collusive or sham proposal;

(4) Neither the subcontractor nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other bidder, firm or person to fix the price or prices in said subcontractor’s Proposal, or to secure through collusion, conspiracy connivance, or unlawful agreement any advantage against the ______________________ or any person interested in the proposed contract; and

(5) The price or prices quoted in the subcontractor’s proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the bidder of any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

_________________________________________

_________________________________________

Title

Sworn to and subscribed before me this ______________ day of ________________________, 20_.

_________________________________________

_________________________________________

Title

My commission expires:_______________________
KNOW ALL MEN BY THESE PRESENTS, that we, ________________________________

_______________________________________________________________
as Principal, and ______________________________________________________,
as Surety are held and firmly bound unto the City of Washington (hereinafter called the Owner), in the sum of ________________________________________________________________ Dollars ($__________), lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the accompanying bid, dated ____________________, 20___ for the CANONSBURG PARK PAVILION SITE DEVELOPMENT project.

NOW THEREFORE, if the Principal shall not withdraw said bid within the period specified therein after the opening of the same, or, if no period be specified, within Sixty (60) days after said opening, and shall within Ten (10) days after the prescribed forms are presented to him for signature, enter into a written contract with the Owner in accordance with the bid accepted, and give bond with good and sufficient surety, as may be required, for the faithful performance and proper fulfillment of such contract, or in the event of the withdrawal of said bid within the period specified, or the failure to enter such contract and give such bond within the time specified, if the Principal or his Surety shall pay the Owner ten percent (10%) of the amount specified in said bid as liquidated damages, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several seals this ____________________ day of ____________________, 20__, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.
IN PRESENCE OF:

_________________________  ___________________________________(SEAL)
  (Individual Principal)
    ________________
  (Address)     (Business Address)

_________________________  ___________________________________(SEAL)
  (Individual Principal)
    ________________
  (Address)     (Business Address)

ATTEST:

_________________________  ____________________________________________
  (Corporate Principal)
    ________________
  (Business Address)

_________________________  By: ________________________________
  (AFFIX CORPORATE SEAL)
    ________________
  (Corporate Surety)

WITNESS:

_________________________  ____________________________________________
  (Corporate Surety)
    ________________
  (Business Address)

(Power-of-Attorney) for person signing for surety company must be attached to bond.
NOTICE OF AWARD

To: ______________________________   Date:______________________________

_________________________________________________

_________________________________________________

PROJECT DESCRIPTION: CANONSBURG PARK PAVILION SITE DEVELOPMENT

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids dated ______________, and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of $______________________.

You are required by the Instruction to Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Payment BOND, Maintenance BOND, and Certificates of Insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this ________________________ day of ________________________, 20_____.

FRIENDS OF CANONSBURG TOWN PARK

_________________________________________________

ACCEPTANCE OF NOTICE

Receipt of the Above NOTICE OF AWARD is hereby acknowledged by

__________________________________________, this the ______________________________ day of _____________, 20__

By: ___________________________

Title ___________________________
AGREEMENT

THIS AGREEMENT, made this ______ day of __________, 20__, by and between the Friends of Canonsburg Town Park, hereinafter referred to as the "OWNER", a Municipal Authority under the Commonwealth of Pennsylvania, and ___________________________________________________ (A Corporation existing under the laws of the State of ________________) (A Partnership consisting of _____________________)(A Individual trading as _____________________________) located in __________________ the State of ____________________ hereinafter referred to as the "CONTRACTOR".

WITNESSETH, that the parties hereto mutually agree as follows:

ARTICLE 1 - CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Condition of the Contract (General and Special), Drawings, Specifications, all Addenda issued prior to execution of this Agreement, and all Modifications issued subsequent thereto. These form the Contract and all are as fully a part of the Contract as if attached to this Agreement or repeated herein. An enumeration of the Contract Documents appears in Article 8.

ARTICLE 2 - THE WORK

The Contractor shall perform all the work required by the Contract Documents for the Canonsburg Park Pavilion Site Development project.

ARTICLE 3 - THE ENGINEER

The Engineer for this project is:

WIDMER ENGINEERING INC.
61 East Wheeling Street
Washington, PA  15301
Phone:  (724) 228-1550
Fax:       (724) 228-7057

ARTICLE 4 - CONTRACT SUM

The Owner shall pay the Contractor for the performance of the work included under this Contract subject to additions and deductions provided herein, in current funds, as follows:

The aggregate for the amounts determined by applying the lump sum prices submitted on the proposal to the actual quantities, the estimated amount being______________________________________________ ($__________________).

ARTICLE 5 - TIME OF COMMENCEMENT AND COMPLETION

The work to be performed under this Contract shall commence within ten (10) calendar days after the date of "Notice to Proceed" and completed within one hundred and eighty (180) calendar
days.

**ARTICLE 6 - PROGRESS PAYMENTS**

Based upon application for payment submitted to the Engineer by the Contractor and payment estimates issued by the Engineer, the Owner shall make progress payments on account of the Contract Sum to the contractor as provided in the conditions of the Contract as follows:

On or about the first day of each month, ninety percent (90%) of the proportion of the Contract Sum properly allocated to labor, materials, and equipment incorporated in the work and ninety percent (90%) of the portion of the Contract Sum properly allocable to materials and equipment suitably stored at the site or at some other location agreed upon in writing by the parties, less the aggregate of previous payment in each case; and upon substantial completion of the entire work, a sum sufficient to increase the total payments to one hundred percent (100%) of the Contract Sum, less incomplete work and unsettled claims.

**ARTICLE 7 - FINAL PAYMENT**

Upon the completion of all work required by the Contract, the Engineer shall submit a Project Completion Certificate with the Owner. Within thirty (30) days after filing of such Certificates and a final payment estimate issued by the Engineer, the Owner shall pay to the Contractor the full Contract Sum, less all prior payments. All prior payments including those related to Change Orders shall be subject to correction by the final payment.

**ARTICLE 8 - MISCELLANEOUS PROVISION**

8.1 Terms used in this Agreement which are defined in the General Conditions of the Contract shall have the meanings designated in those General Conditions.

8.2 The Contract Documents, which constitute the entire Agreement between the Owner and the Contractor, except for Modifications issued after execution of this Agreement, are enumerated as follows:

- Advertisement for Bids
- Instructions to Bidder
- Form of Proposal
- Subcontractors
- Non-Collusion Affidavit of Prime Bidder and Subcontractor
- Bid Bond
- Notice of Award Agreement
- Corporate Certificate
- Partnership Certificate
- No-Lien Agreement
- General Instructions for Bonds
- Performance Bond
- Payment Bond
- Maintenance Bond
- Affidavit Re: Workman’s Compensation
- Affidavit Re: Non Discrimination
- Non-Discrimination/Sexual Harassment Clause
- Certificate of Insurance
- Notice to Proceed
- Application and Certificate for Payment
- Contract Change Order
- General Conditions
- Special Conditions
- Prevailing Wage Determination
IN WITNESS WHEREOF, the parties hereto have executed this Agreement in three (3) duplicate counterparts, each of which shall be considered as an original, as of the day and year first above written.

WITNESS:      CONTRACTOR:

By:______________________________

_________________________   Title:_______________________________

SEAL:  

Friends of Canonsburg Town Park
Canonsburg, Pennsylvania

WITNESS:

_________________________  

By:______________________________
PARTNERSHIP CERTIFICATE

State of _________________________

SS

County of _________________________

On this _____________ day of __________________ 20____, before me personally appeared______________________, known to me and known by me to be the person who executed the above instrument, who being by me first duly sworn, did depose and say that he is a general partner in the firm of ____________; and that said firm consists of himself and ___________________________ that he executed the foregoing instrument on behalf of said firm for the uses and purposes stated herein.

___________________________________
Notary Public in and for the County

of__________________________________

State of_____________________________

(NOTARIAL SEAL)
NO LIEN AGREEMENT

WHEREAS ______________________________________________________________
______________________________________________________________
entered into an agreement with ________________________________________,
____________________________________, Pennsylvania, to provide materials and perform labor
for all operations in connection with the CANONSBURG PARK PAVILION SITE
DEVELOPMENT.

NOW THEREFORE, it is hereby stipulated and agreed by and between the said parties, as part of
the said Contract and for the consideration therein set forth, that neither the undersigned Contractor,
any subcontractor or materialman, nor any other person furnishing labor or materials to the said
Contractor under this Contract shall file a lien, commonly called a mechanic’s lien, for work done
or materials furnished to the said building or any part thereof, or to the grounds adjacent thereto.

This stipulation is made and intended to be filed with the County Prothonotary within ten (10) days
after date, in accordance with the requirements of Assembly of Pennsylvania, in such case provided.

IN WITNESS WHEREOF, the said parties hereto have hereunder set their hands and seals this
________________________ day of ________________ 20___.

OWNER:

WITNESS: BY ________________________________
________________________ TITLE ________________________________

CONTRACTOR:

WITNESS: BY ________________________________
________________________ TITLE ________________________________
GENERAL INSTRUCTIONS FOR BONDS

1. The "Bid Bond" form shall be used for the protection of the Owner in receiving bids. There shall be no deviation from this form.

2. The "Performance Bond" form shall be used for construction work on the furnishing of supplies whenever a bond is required. There shall be no deviation from this form.

3. The "Payment Bond" Form, for the protection of persons supplying labor and material, shall be used on all contracts where such bond is required. This bond shall provide that every person, co-partnership, association or corporation who, whether as subcontractors or otherwise, has furnished material or supplied or performed labor in the prosecution of the work, as above provided, and who has not been paid therefore, may sue in assumpsit on said bond, the name of the Owner, for this, their or its use, and prosecute the same to final judgment for such sum or sums as may be justly due him, them or it, and have execution thereon, but the Owner shall not be liable for the payment of any costs or expense of any suit. There shall be no deviation from this form.

4. The "Maintenance Bond" form for the protection of the Owner shall be used on all contracts where such bond is required. There shall be no deviation from this form.

5. The surety on each bond must be a responsible surety company, which is qualified to do business in Pennsylvania and satisfactory to the Owner.

6. If the principals are partners, their individual names will appear in the body of the bond, with the recital that they are partners composing a firm, naming it, and all the members of the firm shall execute the bond as individuals.

7. If the principals are partners, their individual names will appear in the appropriate place, attesting the signature of each individual party to the bond.

8. If the principal or surety is a corporation, the name of the state in which incorporated shall be inserted in the appropriate place in the body of the bond, and said instrument shall be executed and attested under the corporate seal, as indicated in the form. If the corporation has no corporate seal, the fact shall be stated, in which case a scroll or adhesive seal shall appear following the corporate name.

9. The official character and authority of the person or persons executing the bond for the principal, if a corporation, shall be certified by the secretary or assistant secretary, according to the form attached thereto. In lieu of such certificate, there may be attached to the bond, copies of so much of the records of the corporation as will show the official character and authority of the officer signing, duly certified by the secretary or assistant secretary, under the corporate seal, to be true copies.

10. The date of this bond must not be prior to the date of the contract in connection with it is given.
PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that we __________________________________________________________________________

as Principal, and __________________________________________________________________________________

__________________________________________________________________________________________ as Surety, are held and firmly

bound unto ______________________________________________________________________________________

__________________________________________________________________________________________ (hereinafter called the

Obligee,) in the full and just sum of __________________________________________________________________

__________________________________________________________________________________________ Dollars ($________________), Lawful money of

the United States, for payment of which sum well and truly to be made, we bind ourselves, our

heirs, administrators, executors, successors, and assigns, jointly and severally, firmly by these

presents:

WHEREAS said Principal has entered into a certain contract with said Obligee dated

________________________________________, 20____ (hereinafter called the Contract) for the:

CANONSBURG PARK PAVILION SITE DEVELOPMENT which contract and the

specifications for said work shall be deemed a part hereof as fully as if set out herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that

if the Principal shall faithfully perform the contract on his part at the time and in the manner therein

provided including any and all warranties and representations of the Principal set forth in said

contract, and satisfy all claims and demands incurred in or for the same, or growing out of the same,
or for injury or damage to persons or property in the performance thereof, and shall fully identify

and save harmless the said Obligee from any and all cost and damage which the said Obligee may

suffer by reason of failure to do so, and shall fully reimburse and repay the said Obligee any and all

outlay and expense which it may incur by reason of any such default, then this obligation shall be

null and void; otherwise it shall remain in full force and virtue.

The said surety, for value received, hereby stipulates and agrees that no change, extension of
time, alteration or addition to the terms of the contract or to the work to be performed thereunder of
the specifications accompanying the same shall in any way affect its obligations or bond, and it
does hereby waive notice of any such change, extension of time, alteration or addition to the terms
of the contract or to the work or to the specifications.

(Performance Bond)

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Signed, sealed, and delivered in three (3) counterparts this

_________________________________________ day of _________________________, 20___.

(Individual Principals Sign Here)

_________________________________________ (Seal)

_________________________________________ (Seal)

In the presence of:

_________________________________________ (Seal)

_________________________________________ (Seal)

(Corporate Principals Sign Here)

ATTEST:

_________________________________________

_________________________________________

(Surety Sign Here)

_________________________________________

_________________________________________

(Performance Bond)

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PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: that ________________________________

(Name of Contractor)

_____________________________________________________________________________

(Address of Contractor)

a _____________________________________________________________, hereinafter called

(Corporation, Partnership, or Individual)

Principal, a ________________________________

(Name of Surety)

_____________________________________________________________________________

(Address of Surety)

hereinafter called Surety, and held and firmly bound unto __________________________

_____________________________________________________________________________

(Name of Owner)

_____________________________________________________________________________

(Address of Owner)

hereinafter called OWNER, in the penal sum of ________________________________

dollars, ($_____________) in lawful money of the United States, for the payment of which sum

well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly

by these presents.

WHEREAS, the Principal entered into a certain contract with the OWNER dated the

__________________ day of _________________, 20___, a copy of which is hereto attached and

made a part hereof for the CANONSBURG PARK PAVILION SITE DEVELOPMENT.

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms,
SUBCONTRACTORS, and corporations, furnishing materials, for or performing labor in the
prosecution of the WORK provided for in such contract, and any authorized extension or
modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal, and
coke, repairs on machinery, equipment and tools, consumed or used in connection with the
construction of such WORK, and all insurance premiums on said WORK, and for all labor,
performed in such WORK whether by SUBCONTRACTOR or otherwise, then this obligation shall
be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety for value received hereby stipulates and
agrees that no change, extension of time, alteration or addition to the terms of the contract or to the
WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any
way affect its obligation on this BOND, and it does hereby waive notice of any such change,
extension of time, alteration or addition of the terms of the contract or to the WORK or to the
SPECIFICATIONS.

(Payment Bond)
O-1
PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in __________________________ (Number) counterparts, each one of which shall be deemed an original, this the _____________ day of __________, 20___.

ATTEST:   ___________________________________

Principal

_________________________  By: ________________________________

(Principal) Secretary

_________________________  ___________________________________

(SEAL)

_________________________  ___________________________________

Witness as to Principal    Address

_________________________  ___________________________________

_________________________  ________________________ ___________

Address Surety

_________________________  ___________________________________
ATTEST:

_________________________  (Surety) Secretary

(SEAL)

_________________________  By: ________________________________  Witness as to Surety  Attorney-in-fact

_________________________  ________________________ ___________

Address     Address

NOTE: Date of BOND must not be prior to date of Contract. If CONTRACTOR is Partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the PROJECT is located.
MAINTENANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that we _______________________________

_______________________________________________________________ as Principal, and

_______________________________________________________________ as Surety, are held and firmly bound unto

_______________________________________________________________

(hereinafter called the Obligee,) in the sum of ________________________________

($________________________), or the final amount of the contract including all change order and modifications for payment of which sum well and truly to be made, we bind ourselves, our heirs, administrators, executors, successors, and assigns, jointly and severally, firmly by these presents:

THE CONDITION OF THIS OBLIGATION IS SUCH WHEREAS that, said Principal has entered into a certain contract, hereto attached, with the Owner dated __________, 20___ for the CANONSBURG PARK PAVILION SITE DEVELOPMENT.

NOW, THEREFORE, if the Principal shall remedy without cost to the Obligee any defects which develop during a period of ________ year(s) from the date of completion and acceptance of the work performed under said contract provided such defects, in the judgment of the Obligee or his successor having jurisdiction in the premises, are caused by defective, inferior materials or workmanship, then this obligation shall be void; otherwise it shall remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals this ________ day of ______________________, 20___, the name and corporate seal of each corporate party being hereto affixed and these presented duly signed by its undersigned representative, pursuant to authority of its governing body.
IN THE PRESENCE OF:

__________________________________________  ___________________________________(SEAL)
(Individual Principal)

__________________________________________  ___________________________________
(Address)     (Business Address)

__________________________________________  __________________________________(SEAL)
(Individual Principal)

__________________________________________  ___________________________________
(Address)     (Business Address)

ATTEST:  

__________________________________________
(Corporate Principal)

__________________________________________
(Business Address)

__________________________________________
By: ________________________________
(Affix Corporate Seal)

__________________________________________
(Corporate Surety)

WITNESS:

__________________________________________
(Corporate Surety)

__________________________________________
(Business Address)

__________________________________________
By: ________________________________
(Affix Corporate Seal)

The rate of premium on this bond is _________________ per thousand. Total amount of premium charged, $__________________________. (The above must be filled in by Corporate Surety.)
AFFIDAVIT RE:

ACCEPTING PROVISIONS OF THE WORKMAN'S COMPENSATION ACT

State of _____________________

County of ___________________

_____________________________  ______________________________
(Name of Officer, if corp.)  (Title of Officer, if corp.)

___________________________________________________________________
(Name of Contractor)

being duly sworn according to law deposed and says that he/they/it has/have accepted the provisions of the Workmen's Compensation Act of 1915 of the Commonwealth of Pennsylvania, with its supplements and amendments, and has/have insured his/their/its liability thereunder in accordance with the terms of said Act with _____________________________ Company.

_____________________________
(Contractor)

_____________________________
Signature of Officer or Agent

SWORN to and subscribed before me this ________________ day of
______________________________, 20____.

______________________________
(Notary Public)

My Commission Expires:
NON-DISCRIMINATION AFFIDAVIT OF PRIME BIDDER

State of

County of

being first duly sworn according to _________________ Law, deposes and says as follows:

(1) He is the ___________ of the bidder who has submitted the attached bid;

(2) He 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 insure that applicants are employed, and that employees or agents are treated during employment, without regard to their race, color, religious creed, handicap, ancestry, national origin, age or sex. Such affirmative action shall include, but is not limited to: 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 to be provided by the contracting agency setting forth the provisions of this nondiscrimination clause.

(3) He 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, handicap, ancestry, national origin, age, or sex.

(4) He 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.

(5) It shall be no defense to a finding of noncompliance with this nondiscrimination 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.

(6) 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 this nondiscrimination clause, Contractor shall then employ and fill vacancies through other nondiscriminatory employment procedures.
(7) Contractor shall comply with all state and federal 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 be terminated or suspended, in whole or in part, and Contractor may be declared temporarily ineligible for further Commonwealth contracts, and other sanctions may be imposed and remedies invoked.

(8) He shall furnish all necessary employment documents and records to, and permit access to its books, records and accounts by, the contracting agency and the Office of Administration, Bureau of Affirmative Action, for purposes of investigation to ascertain compliance with the provisions of this clause. 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.

(9) He shall actively recruit minority subcontractors or subcontractors with substantial minority representation among their employees.

(10) He shall include the provisions of this nondiscrimination clause in every subcontract, so that such provisions will be binding upon each subcontractor.

(11) His 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.

CONTRACTOR:

By ___________________________

________________________________

TITLE

OWNER:

By ___________________________

________________________________

TITLE
CERTIFICATES OF INSURANCE

A. Workmen’s Compensation Insurance ................................................................. Statutory

B. Comprehensive Bodily Injury Liability Insurance ........................................... $1,000,000.00

C. Comprehensive Property Damage Liability Insurance ................................. $1,000,000.00

D. Comprehensive Automobile Bodily Injury and Property Damage Insurance
   (1) Personal Injury ........................................................................................................ $1,000,000.00
   (2) Property Damage ................................................................................................. $1,000,000.00

NOTE: Owner and Redevelopment Authority of the County of Washington to be named as additional insured on everything except Workmen’s Compensation.
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
NOTICE TO PROCEED

TO:_______________________________       DATE:_____________________________

_______________________________       PROJECT:_____________________________

_______________________________       _________________________________

You are hereby notified to commence WORK in accordance with the Agreement dated
________________________, 20____, on or before _________________, 20______, and you are
to complete the WORK by within ____________ consecutive calendar days thereafter. The date
of completion of all WORK is therefore _________________________________, 20______.

__________________________________________

BY:_______________________________________

TITLE:____________________________________

CONTRACTOR ACKNOWLEDGEMENT

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by
______________________________________.

This the ______________________day of_________________________, 20_____.

__________________________________________

BY__________________________________

Title_________________________________
APPLICATION AND CERTIFICATE FOR PAYMENT

PROJECT: 

ENGINEER: 

TO: 

CONTRACTOR: 

ESTIMATED DATE: 

ESTIMATE NO.: 

ATTN: 

PERIOD FROM: 

TO: 

CHANGE ORDER SUMMARY

<table>
<thead>
<tr>
<th>Change Orders approved</th>
<th>ADDITIONS $</th>
<th>DEDUCTIONS $</th>
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</thead>
<tbody>
<tr>
<td>in previous months by</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Owners ---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subsequent Change Order</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Numbers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approved (Date)</td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTALS

Net change by Change Orders $ 

BILLING SUMMARY

ORIGINAL CONTRACT SUM $ 

Net change by Change Orders $ 

Contract Sum to Date $ 

Total Completed and Stored to Date $ 

RETURNAGE _______ % $ 

TOTAL EARNED LESS RETURNAGE $ 

Less Previous Certificates for Payment $ 

CURRENT PAYMENT DUE $ 

Contractor: By: Date: 

In accordance with the Contract and this Application for Payment the Contractor is entitled to payment in the amount shown above. 

Project Engineer Date 

This Certificate is not negotiable. It is payable only to the payee named herein and its issuance, payment and acceptance are without prejudice to any rights of the Owners or Contractor under their Contract.

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**APPLICATION AND CERTIFICATION FOR PAYMENT**

**QUANTITY ITEMIZATION SHEET**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Contract Quantity</th>
<th>(1) Previous Quantity</th>
<th>(2) Current Quantity</th>
<th>(1+2=3) Total Quantity</th>
<th>(4) Unit Price</th>
<th>(3x4=5) Work Completed</th>
<th>(5) Material Stored</th>
<th>(5+6=7) Total</th>
</tr>
</thead>
</table>

TOTAL
CONTRACT CHANGE ORDER

OWNER: _______________ DATE: _______________

PROJECT NAME: RECYCLING DROPOFF

TO: ____________________________

CHANGE ORDER NO.: __________________

You are hereby requested to comply with the following changes from the Contract Plans and Specifications

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION OF CHANGES, QUANTITIES, UNITS, COMPLETION, SCHEDULE, ETC.</th>
<th>DECREASE IN CONTRACT PRICE</th>
<th>INCREASE IN CONTRACT PRICE</th>
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<tbody>
<tr>
<td>(1)</td>
<td></td>
<td>(3)</td>
<td>(4)</td>
</tr>
</tbody>
</table>

Change in contract price due to this Change Order

Total Decrease ................................................. $ - XXXXXXXXXX

Total Increase .............................................. XXXXXXXXXX $ -

Difference between Column (3) & (4) $ - $ -

Net Increase or Decrease $ - $ -

The sum of $_______ is hereby (added to, subtracted from, or make no change to) the total contract price, and the total adjusted contract price to date thereby is $_______.

The time provided for completion in the contract is (increased by ____, decrease by ____, or remains the same). This document shall become an amendment to the contract and all provisions of the contract will apply hereto.

Accepted by: ____________________________ Date _______________

Contractor

Recommended by: ____________________________ Date _______________

Engineer

Approved by: ____________________________ Date _______________

Owner
CERTIFICATES OF INSURANCE

A. Workmen’s Compensation Insurance ............................................................... Statutory

B. Comprehensive Bodily Injury Liability Insurance ......................................... $1,000,000.00

C. Comprehensive Property Damage Liability Insurance .......................... $1,000,000.00

D. Comprehensive Automobile Bodily Injury and Property Damage Insurance
   (1) Personal Injury ...................................................................................... $1,000,000.00
   (2) Property Damage .............................................................................. $1,000,000.00

NOTE: Owner, Redevelopment Authority of the County of Washington and Widmer Engineering Inc. to be named as additional insured on everything except Workmen’s Compensation.
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<td>Approval and Acceptance</td>
<td>GC-2</td>
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<td>GC-3</td>
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<td>Provisions Required By Law Deemed Inserted</td>
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<td>Contract Security</td>
<td>GC-3</td>
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<td>Additional Bonds</td>
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GENERAL CONDITIONS

1. Definitions

The following terms, as used in these contract documents are respectively defined as follows:

a. "Additional Work"
   The term "additional work" as used herein, refers to and includes work required by the Owner, which involves changes or alterations.

b. "Changes and Alterations"
   The terms "changes and alterations" as used herein mean deviations from the Plans, Specifications, and Addenda in their present form, but only when ordered by the Owner or Engineer in writing, prior to the performance of any work affected by such changes or alterations. Increases or decreases in estimated quantities shall not be considered changes or alterations for any purpose whatsoever.

c. "Contractor"
   The party designated as such in the agreement, acting directly or through agents, or employees or the surety in case of default.

d. "Owner"
   Friends of the Canonsburg Town Park
   Canonsburg, Pennsylvania

e. "Engineer"
   The term "Engineer" shall mean the Professional Architectural/ Engineering firm or representative chosen by the Owner to provide professional services for the project.

   Nothing contained in this contract shall create any contractual relationship between the Engineer and the contractor.

f. "Notice"
   Where in any of the contract documents there is any provision in respect to the giving of any notice, such notice shall be deemed to have been given to the Owner, when written notice shall be delivered to the Owner, or shall have been placed in the United States Mails, sent certified or registered mail, postage prepaid, addressed to the chief executive officer of the Owner at the place where the bids or proposals for the contract were opened; as to the contractor, when a written notice shall be delivered
site of the project or by sending by certified or registered mail, postage prepaid, such written notice in the United States Mails addressed to the contractor at the place stated in the papers prepared by him to accompany his proposal as the address of his permanent place of business.

g. "Specifications" The directions, provisions, and requirements contained herein, or in any of the contract documents pertaining to the method and manner of performing the work or to the method of measurement and the quality of materials to be furnished under the contract.

h. "Subcontractor" Any person, firm or corporation undertaking the construction of a part of the work under the terms of the contract, by virtue of a separate agreement with the contractor, or with any other subcontractor.

i. "Surety" The corporate body which is bound with and for the contractor for the satisfactory performance and maintenance of the work by him and the prompt payment in full for utility services, labor, equipment rental and materials as provided in the bonds.

j. "Work" The term "work" as used herein, refers to any and all obligations, duties, and responsibilities necessary to the completion of the project assigned or undertaken by the contractor, including all plant, labor, materials, supplies, equipment, and other facilities, and things necessary or proper for or incidental to the carrying out and completion of the terms of this contract.

2. Specification Titles

Titles to sections and paragraphs in these contract documents are introduced merely for convenience and shall not be taken as part of the specifications, and furthermore, shall not be taken as a correct or complete segregation of the several units of material and labor. The sections and paragraphs shall not control the contractor in dividing the work among subcontractors.

3. Approval and Acceptance

Approval and acceptance in these specifications shall mean approval and acceptance by the Engineer, but no acceptance by the Engineer shall bind the Owner in case of proven defective work or other clear violations of the contract; nor will approval of material or
equipment before same is brought on the premises be held to constitute acceptance, in case such items are found not to comply with specification requirements.

4. **Special Conditions Take Precedence**

The Special Conditions and/or special notes on the drawings may supplement or amend the General Conditions; therefore, the Special Conditions and/or special notes on the drawings shall take precedence over these General Conditions.

5. **Provisions Required By Law Deemed Inserted**

Each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein and the contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, upon application of either party, the contract shall forthwith be then physically amended to make such insertions.

6. **Contract Security**

The contractor shall furnish a surety bond in an amount at least equal to one hundred percent (100%) of the contract price as security for the faithful performance of this contract.

7. **Additional Bonds**

Should any surety upon any bonds become unsatisfactory to the Owner, or if for any reasons any bond shall cease to be adequate security to the Owner, the contractor shall within five (5) days after notice from the Owner, furnish such additional bonds as may be required from time to time to protect the interest of the Owner and of persons, firms, or corporations supplying labor, material, equipment or services in the prosecution of the work contemplated by the contract. The additional bonds required shall be with other sureties as may be satisfactory to the Owner. The premiums on such additional bonds shall be paid by the contractor. No further payments shall be deemed due, nor shall further payments be made until the required additional bonds have been furnished by the contractor and approved by the Owner.

8. **Insurance**

The contractor shall not commence work under this contract until he has obtained all insurance required under this paragraph and such insurance has been approved by the Owner, nor shall the contractor allow any subcontractor to commence work in his subcontract until all similar insurance required of the subcontractor has been obtained.

The contractor shall be responsible for all injury to persons, or damage to property, either directly or indirectly, that may result from his operations. The contractor shall obtain and pay for such insurance as will protect him from claims under the Workmen's Compensation Act and from any other claims for damages for personal injury, including death, or for
damages to property, either real or personal, which may arise from operations under this contract, whether such operations by himself or by anyone directly or indirectly employed by him. The contractor shall effect and maintain the following insurance in companies or through agents:


b. "Comprehensive Bodily Injury Liability Insurance" not less than One Million Dollars ($1,000,000.00).

c. "Comprehensive Property Damage Liability Insurance" not less than One Million Dollars ($1,000,000.00).

d. "Comprehensive Automobile Bodily Injury and Property Damage Insurance" not less than One Million Dollars limits ($1,000,000.00) for personal injury and One Million Dollars limit ($1,000,000.00) for property damage. This insurance shall cover all automotive vehicles owned or hired by the contractor and used on this contract, not otherwise so covered by insurance. Automatic coverage shall be provided for extensions of the contract.

The contractor shall deliver to the Owner before commencing work under this contract, certificates from insurance companies or their agents, certifying that such insurance is in effect and will not be cancelled during the conduct of the work without thirty (30) days written notice to the Owner. The contractor shall report and pay all Old Age Benefit and Social Security Taxes and other insurance as required by State and Federal laws.

9. Subletting or Assigning of Contracts

The contractor shall not sublet, assign, sell, transfer, or otherwise dispose of this contract or any part hereof or any interest herein or any monies due or to become due hereunder without the prior written consent of the Owner. The consent to any subletting, assignment, or transfer shall not operate to relieve the contractor or his sureties of any of his or its obligations under this contract. Nothing contained herein shall be construed to hinder, prevent or affect an assignment of monies due or to become due hereunder made for the benefit of the contractor's creditors pursuant to law.

10. Subcontractors

The contractor shall notify the Owner in writing of the names of all subcontractors proposed for the work and the extent and character of the work to be done by each subcontractor. No subcontractor shall be permitted to perform any work on the project unless and until the Owner has notified the contractor in writing that such subcontractor has been approved. If requested by the Owner, the contractor shall supply proof that the proposed subcontractor is particularly equipped and capable to perform such work. Proof of qualifications and
capability of proposed subcontractors shall include the following:

a. A financial statement certified by its accountants.

b. A list of contracts successfully and satisfactorily carried to completion on work of a similar nature.

c. A list of contracts presently underway, the percentage of completion of each contract and the name and address of the Owner.

d. A list of equipment for the work.

Subcontract work shall not begin until approval has been secured from the Owner. It is understood, however, that any approval by the Owner for the subcontracting of any of the work under the contract in no way relieves the contractor from his full obligations under the contract. The contractor shall be responsible for all the acts or omissions of any subcontractor or supplier and shall be liable for all damages caused by the acts or omissions of any subcontractor or supplier.

Subletting by subcontractors shall be subject to the same conditions as aforesaid. Nothing contained in this contract shall create any contractual relation between the subcontractor and the Owner.

11. **Subcontracts**

The applicable provisions of the contract shall be incorporated into each subcontract entered into by this contractor.

12. **Copies of Drawings Furnished**

Unless otherwise provided in the contract documents, the Owner will furnish to the contractor, free of charge, up to four (4) copies of drawings and specifications for the execution of the work. If any additional copies are required, they shall be supplied by the Owner at the cost of printing.

13. **Specifications and Drawings**

a. **Interpret As Complete Work.** The contractor shall keep on the worksite a copy of the drawings and specifications, and the Engineer shall at all times have access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown and mentioned in both. In case of difference between the drawings or specifications, the specifications shall govern. Omissions from the drawings or specifications or of details of work which are manifestly necessary to carry out the intent of the drawings and specifications or which are customarily performed shall not relieve the contractor from performing such omitted details of work but they shall be performed as if fully set forth and described in the drawings.
and specifications.

b. Checking of Drawings and Dimensions. The contractor shall check all drawings furnished him immediately upon their receipt and shall promptly request of the Engineer such interpretation and clarification as may be required. Figures marked down on drawings shall in general be followed in preference to scale measurements. Large scale drawings shall in general govern small scale drawings. The contractor shall compare all drawings and verify the figures before laying out the work and will be responsible for any errors which might have been avoided thereby. When measurements are affected by conditions already established, the contractor shall take measurements not with standing the giving of scale or figure dimensions in the drawings.

c. Deviations. Deviations from the drawings and the dimensions therein given shall be made only after written authority is obtained from the Engineer. Prior to issuing written authority allowing any deviation, the Engineer must obtain the Owner's concurrence.

d. Interpretation and Instructions. All questions regarding the figures, drawings, plans, and specifications and the interpretation of thereof and the resolving of conflicts and inconsistencies therein shall be determined by the Engineer and such determination shall be final.

14. Ownership of Drawings

All drawings, specifications, and copies thereof furnished to the contractor by the Engineer are the property of the Owner and are to be returned to the Owner on request at the completion of the work.

15. Work in Inclement Weather

All work which cannot be properly protected must cease during inclement weather. The Engineer shall be the sole judge as to the adequacy of protective measures taken by the contractor.

16. Inspection of Work

a. Defective Workmanship or Material. All Material and workmanship (if not otherwise designated by the specifications) shall be subject to inspection, examination, and test by the Owner's representatives at any and all times during manufacture and/or construction are carried on. The Owner shall have the right to reject defective material and workmanship or require its correction. Rejected workmanship shall be satisfactorily corrected, and rejected material shall be satisfactorily replaced with proper material without charge therefore, and the contractor shall promptly segregate and remove the rejected material from the project. The contractor shall bear all costs of correcting rejected work, including the cost of the Engineer's additional services thereby made necessary. If the contractor
fails to proceed at once with the replacement of rejected material and/or the correction of defective workmanship, the Owner may, by contract or otherwise, replace such material and/or correct such workmanship and charge the cost thereof to the contractor, or may terminate the right of the contractor to proceed as provided in these General Conditions, the contractor and surety being liable for any damage to the same extent as provided elsewhere in these General Conditions for termination thereunder.

b. Tests. The contractor shall furnish promptly, without additional charge, all reasonable facilities, labor, and materials necessary for the safe and convenient inspection and test that may be required by the Engineer. All inspection and tests shall be performed in such a manner as to not unnecessarily delay the work. Special, full size, and performance tests shall be as described in the specifications.

c. Final Inspection. Should it be considered necessary or advisable by the Owner at any time before final acceptance of the entire work to make an examination of work already completed, by removing or tearing out same, the contractor shall on request promptly furnish all necessary facilities, labor, and material. If such work is found to be defective in any material respect, the contractor will bear all expenses of such examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the contract, the contractor will be allowed payment on a "force account" basis in accordance with Section 36 of these General Conditions, and he shall, in addition, if completion of the work has been delayed thereby, be granted a suitable extension of time on account of the additional work involved.

17. Standard of Quality

Whenever in these specifications an equipment item, article or material is defined by describing a proprietary project or by using a trade name of a manufacturer or vendor, the term "or equal" if not inserted therewith shall be assumed as signifying that the specifications will be interpreted liberally, except that on projects which are an addition to an existing facility, system, equipment, item or article, the Engineer shall specify, when in his opinion such is necessary for reasons of compatibility and standardization, specific equipment, item, article, or material by a trade name of a manufacturer or vendor including catalog number, size, and type. Accordingly, it is to be understood that any reference to a particular manufacturer's product either by name or by limiting description, except as noted herein, has been made solely for the purpose of more clearly indicating the minimum standard of quality desired. Any other make, except as noted herein, substantially similar and performing as effectively the duties imposed by the general design, performance and space allowed by the plans may be submitted for approval by the Engineer provided, however, such approval is obtained prior to awarding the contract, otherwise it shall be assumed that the contractor will furnish the materials, articles, or equipment items specified herein. No substitution shall be made without the written approval of the Engineer who shall be the judge of the standard of quality.
18. Labor, Materials, and Equipment

a. Unless otherwise stipulated, the contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation, and other facilities necessary for the execution and completion of the work.

b. Unless otherwise specified, all materials and equipment shall be new and both workmanship and materials shall be of good quality. The contractor, shall, if required, furnish satisfactory evidence as to the kind and quality of materials and equipment.

19. Samples and Descriptive Data

a. Any samples and descriptive data required shall:

(1) Be submitted within the time specified in these specifications, or if a time is not specified, within a reasonable time before use to permit inspection and testing.

(2) Be shipped prepaid and delivered as specified in these specifications, or as directed by the Engineer.

(3) Be properly marked to show the name of the material, trade name of manufacturer, place of origin, name and location of the work where the material represented by the sample is to be used, and the name of the contractor submitting the sample.

(4) Be checked and stamped with the approval of the contractor.

b. Samples not subjected to destructive tests may be retained until completion of the work but thereafter will be returned to the contractor, at his expense, if he so requests in writing. Failure of any sample to pass the specified requirements will be sufficient cause for refusal to consider further any samples from the same manufacturer whose materials failed to pass the tests.

20. Proof of Compliance With Specifications

When testing of any material or product is not specified as a responsibility of the Owner, satisfactory proof of compliance with the specifications shall be submitted by one or more of the following methods. Where testing of any material or product is a responsibility of the Owner, satisfactory proof of compliance with the specifications be submitted in accordance with method (a) or (b) below, before a sample will be tested. The method of proof of compliance shall be subject to the approval of the Engineer, and all costs thereof shall be at the expense of the contractor unless otherwise specified.

a. Manufacturer's Certificate of Compliance: In the case of standard labeled stock products of standard manufacture which has a record of satisfactory performance in
similar work over a period of not less than two (2) years, the Engineer may accept a notarized statement from the manufacturer certifying that the product conforms to the applicable specifications.

b. Mill Certificates: For materials where such practice is the usual standard, the Engineer may accept the manufacturers' certified mill and laboratory certificate.

c. Testing Laboratory Certification: The Engineer may accept a certificate from a commercial testing laboratory satisfactory to him certifying that it has tested the product submitted within a period acceptable to the Engineer and that the product conforms to the requirements of the specifications.

d. Report of Actual Laboratory Tests: The Engineer may require that the contractor make actual tests of any material, product or end item and submit a report of the specific tests. Such tests shall be made by a commercial testing laboratory approved by the Engineer. Test samples shall be selected by or under the supervision of the Engineer. The method of testing shall comply with the method specified or, when not specified, with a standard approved method. Certified copies in quadruplicate, of the results of the tests, shall be submitted to the Engineer for approval and in such form as he may direct. The results of tests in the required form shall be submitted well in advance of the time when the material or product shall be used in the work.

e. Re-testing: Where testing is specified herein to be performed by the Owner, the Owner will perform the testing or will have the testing performed at a commercial laboratory at the expense of the Owner. Where items or additional samples from items which have been previously testing and approved at the expense of the Owner are required to be retested, the Owner will bear the costs of such re-testing. Where re-testing is required because of the failure of previously tested samples, the expense of all such re-testing shall be borne by the contractor at no expense to the Owner. The contractor shall pay for all additional re-testing required due to subsequent test failures. Where so required for original testing, re-testing will be performed at such laboratories as may be approved by the Engineer.

21. **Superintendence, Supervision**

The contractor shall keep on his work, during its progress, a competent superintendent satisfactory to the Owner. The superintendent shall not be changed without written notice to the Owner except in an emergency. The contractor's superintendent shall have authority to act for the contractor in all matters concerning the work. All communications given to the superintendent shall be binding on the contractor.

22. **Engineer's Authority**

The Engineer is the Owner's representative during the performance of the work. He shall at all times have access to the work wherever it is in preparation and progress. The Engineer will make periodic visits to the site and, to observe the progress of construction and the quality of the work and to determine in general if the work is proceeding in accordance with

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the contract documents.

The Engineer will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the work. The Engineer will not be responsible for the construction means, methods, techniques, sequences, or production or for safety precautions and programs in connection with the work and he will not be responsible for the contractor's failure to carry out the work in accordance with the contract documents.

The Engineer shall render a decision on all questions and disputes submitted to him in writing relating to the execution and progress of the work or the interpretation of the contract documents. Either the Owner or the contractor may demand arbitration of any such matter, notwithstanding the decision of the Engineer.

The Engineer's authority to act under this Section or any other provision of the contract documents, shall not give rise to any duty or responsibility of the Engineer to the contractor or any subcontractor.

23. Protection of Persons and Property

a. The contractor shall be responsible for initiating, maintaining the supervising of all safety precautions and programs in connection with the work. The contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to (i) employees, (ii) all other persons who may be affected, (iii) the work and all materials and equipment to be incorporated, (iv) other property at the site or in the vicinity thereof.

b. The contractor shall comply with all applicable laws, ordinances, rules, regulations, and orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss. He shall erect and maintain, as required by existing conditions and progress of the work, all reasonable safeguards for safety and protection including posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent utilities.

24. Royalties and Patents

The contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner and Engineer harmless from all loss, expense, and damage including attorneys' fees, on account thereof, except the Owner shall be responsible for all such loss when a particular process or the product of a particular manufacturer or manufacturers is specified; but if the contractor has information that the process or article specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives notice to the Owner and Engineer.
25. Permits and Regulations

a. Permits, licenses, and all certificates for inspection that may be required by the authorities for each contractor's particular work shall be secured and paid for by the contractor unless specified otherwise in the SPECIAL CONDITIONS.

b. The contractor shall give all notices and comply with all laws, ordinances, rules, and regulations bearing on the conduct of the work as drawn and specified. If the contractor observes that the drawings and specifications are at variance therewith, he shall promptly notify the Engineer in writing, and any necessary changes shall be adjusted. If the contractor performs any work knowing it to be contrary to such laws, ordinances, rules or regulations, and without such notice to the Engineer, he shall bear all costs arising there from and shall save the Owner harmless from any fines, or loss arising in connection therewith.

26. Other Contracts

The Owner may award other contracts for additional work, and the contractor shall fully cooperate with such other contractors and carefully fit his own work to that provided under other contracts. The contractor shall not commit or permit any act which will interfere with the performance of work by any other contractor.

If any part of the contractor's work depends for proper execution on results upon the work of any other contractor, the contractor shall inspect and promptly report to the Engineer in writing any defects in such work that makes it unsuitable for such proper execution and results. If he fails to so inspect and report such defects, it shall constitute his acceptance of the other contractor's work as fit and proper for the execution of his work, except such defects that may develop in the other contractor's work after the execution of his work.

To insure the execution of his work the contractor shall measure work already in place and shall report at once to the Engineer any discrepancy between the executed work and the drawings.

27. Mutual Responsibility of Contractors

If the contractor should cause damage to any separate contractor on the work, the contractor agrees upon due notice to settle with such contractor by agreement or arbitration if he will so settle. If such separate contractor commences arbitration or suit against the Owner on account of any damage alleged to have been so sustained, the Owner shall notify the contractor, who shall defend such proceedings at his own expense and, if any judgment against the Owner shall arise there from, the contractor shall pay or satisfy it and pay all costs incurred by the Owner.

28. Use of Premises (By Contractor)

The contractor shall confine his apparatus, the storage of materials and the operations of his workmen to limits indicated by law, ordinances, permits, or the contract documents and
shall not unreasonably encumber the premises with his materials or equipment.

The contractor shall not load or permit any part of any structure to be loaded with a weight, or cause pressures or stresses, that will endanger its safety.

The contractor shall not, at any time, store materials or equipment on any of the existing roadways nor shall he perform any construction operation or work on any of the existing roadways unless it is deemed necessary for construction by the Engineer.

The contractor shall conduct his hauling operations in such a manner as not to unduly interfere with traffic. At points where the contractor's equipment or trucks enter, leave or cross existing pavements, he shall erect and maintain suitable signs and warning devices. If the Engineer so orders, the contractor shall station flagmen at such points.

29. Responsibility and Risk

The contractor shall assume all risk and bear any loss or injury to property or persons occasioned by neglect or accident during the progress of work, until the same shall have been completed and accepted by the Owner. He shall also assume all blame or loss by reason of neglect or violation of any state law or local ordinance, or encroachment upon neighbors. He shall make good any injury that may have occurred to any adjoining building in consequence of the erection of this work or during its progress.

30. Owner's Right to Terminate Contract

If (a) the contractor shall be adjudged bankrupt or make an assignment for the benefit of creditors, or (b) a receiver or liquidator shall be appointed for the contractor or for any of his property and shall not be dismissed within twenty (20) days after such appointment, or the proceeding in connection therewith shall not be stayed on appeal within the said twenty (20) days, or (c) the contractor shall refuse all or fail, to supply enough properly skilled workmen or proper materials, or (d) the contractor shall refuse or fail to prosecute the work or any part thereof with such diligence as will insure its completion within the period herein specified (or any duly authorized extension, thereof) or shall fail to complete the work within said period, or (e) the contractor shall fail to make prompt payment to persons supplying labor or materials for the work, or (f) the contractor shall fail or refuse to regard laws, ordinances or the instructions of the Engineer, or otherwise be guilty of a substantial violation of any provision of this contract, then, in any such event, the Owner, without prejudice to any other rights or remedy it may have, within ten (10) days' notice to the contractor, terminate the employment of the contractor and his right to proceed, either as to the entire work or (at the option of the Owner) as to any portion thereof as to which delay shall have occurred, and may take possession of the work and complete the work by contract or otherwise, as the Owner may deem expedient. In such case, the contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the compensation to be paid the contractor hereunder shall exceed the expense of so completing the work (including compensation for additional managerial, administrative and inspection services and any damages for delay) such excess shall be paid to the contractor. If such expense shall exceed such unpaid balance, the contractor and his sureties
shall be liable to the Owner for such excess.

31. **Contractor's Right to Stop Work or Terminate Contract**

If the work shall be stopped by order of the Court or any other public authority for a period of ninety (90) days without act or fault of the contractor or any of his agents, servants, employees, or subcontractors, the contractor may, upon ten (10) days' notice to the Owner, terminate the contract, in which event the Owner, shall pay for all work completed and any expense sustained, plus a reasonable profit.

32. **Method of Payment**

The Contractor shall submit to the Engineer for approval, immediately following the receipt of an executed copy of the Agreement, a Schedule of Work which will consist of an executed copy of the Agreement, a Schedule of Work which will consist of an itemized breakdown on all items of work to be performed under the Contract with the quantities in applicable units as linear feet, lump sum or each, and unit prices thereof arranged in order in which the Contractor proposes to carry on the work. Unit prices shall include all labor, materials, equipment, overhead and profit and shall be the sum total compensation payable for such items of work. Attached to this schedule and as a part thereof shall be a construction schedule which will give the contemplated dates for the start, progress and completion of the major items of work to be performed under this Contract.

For this Contract, the Contractor shall, at the completion of the work, submit to the Engineer a statement in detail showing the amount of Work performed. Approval shall be made on the evaluation of Work performed based on the "Schedule of Work" approved by the Engineer.

The Owner may withhold or, on account of subsequently discovered evidence, nullify the whole or a part of any certificate to such extent as may be necessary to protect:

(a) Defective Work not remedied.
(b) Claims filed, or reasonable evidence indicating probable filing of claims.
(c) A reasonable doubt that the Contract can be completed for the balance then unpaid.
(d) Correction or completion of work by the Owner.
(e) Failure of the Contractor to make payments for replacement of surveys, lines, and grades.

Payments shall be made of amounts withheld when the above grounds have been removed.

No certificate given on payment made under this Contract, except the final certificate on final payment, shall be conclusive evidence of the performance of this Contract, either wholly or in part, and that no payments shall be construed to be an acceptance of defective
Work or improper materials.

Upon the completion of all Work whatsoever required on the Contract and after such time as may be required for the Engineer to determine final quantities, the Engineer shall file a written certificate with the Owner and with the Contractor as to the entire amount of Work performed and the compensation earned by the Contractor, including extra Work and compensation therefore.

Within thirty (30) days after the filing of such certificate of completion, the Owner shall pay to the Contractor the amount therein stated.

33. Estimates of Quantities

The estimated quantities of work to be done and materials to be furnished under this contract, shown in the contract documents and the proposal, are given only for use in comparing bids and to indicate approximately the total amount of the contract; and the right is especially reserved to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the work contemplated by this contract, and such increase or diminution shall not give cause for claims of liability for damages. The Owner and the Engineer do not expressly or by implication assume any responsibility that the quantities shall obtain strictly in the construction of the project, nor shall the contractor plead misunderstanding or deception because of such estimate of quantities or of the character of the work location or other conditions pertaining thereto.

34. Subsurface Materials - Contractor's Representative

a. General

By executing the contract, the contractor represents that he has visited the site, familiarized himself with the location conditions under which the work is to be performed and correlated his observation with the requirements of the specifications.

b. The contractor further represents that he understands that subsurface information has been obtained for the project for Engineering design purposes. This information has also been used in the preparation of estimates of quantities for bidding purposes. However, it is the obligation of the contractor to make his own investigation of subsurface conditions prior to submitting his proposal. The contractor has reviewed all available subsurface information, including but not limited to, boring logs, core recovery, test results and soils reports. The contractor's review has been in great detail through qualified and experienced representatives.

The determination of subsurface materials and conditions to be encountered is a matter of judgement and opinion. All of the information available to the Owner and the Engineer is available to the contractor upon request.
35. **Unexpected Subsurface Conditions**

The contractor will promptly notify the Owner and Engineer in writing or any subsurface or latent Physical conditions at the site differing materially from those indicated in the contract documents. The Engineer will promptly investigate those conditions and advise the Owner in writing if further surveys or subsurface tests are necessary. Promptly thereafter, the Owner will obtain the necessary additional surveys and tests and furnish copies to the Engineer and the contractor. If the Engineer finds that the results of such surveys or tests indicate subsurface or latent physical condition differing significantly from those indicated in the contract documents, a change order shall be issued incorporating the necessary revisions.

36. **Changes and Alterations**

   a. The Owner or Engineer may make such minor changes in the drawings as are deemed necessary by them to complete more fully the project or any thereof, provided that they are of a character as not to affect materially the cost of the work involved.

   b. The contract documents may be modified and changed from time to time in a manner not materially affecting the substance thereof, if such changes are necessary to carry out and complete the work agreed to be done and performed. In the event the Owner orders a change in the work, and the estimated cost of the work covered by such change, is equal to or greater than twenty-five percent (25%) of the total bid listed in the proposal of the total contract sum set out in the agreement, and if such change materially increases the cost of the work, the increased expense will be paid by the Owner. If such change diminishes the cost of the work, the amount of said diminution may be retained by the Owner. No consequent loss or anticipated profit on work not executed will be paid to the contractor.

   c. The contractor shall do such additional work other than that designated by the contract documents as may be ordered in writing by the Owner, to complete fully the work as planned and contemplated. No claim for an addition to the contract sum shall be valid unless so ordered in writing. Where the work is of such character as provided in (a) above, the contractor will receive in full payment for such additional work the unit prices shown in the contract, and in the same manner as if such had been included in the original contract. Any work for which there is no quantity and unit price in the contract, and additional work as provided in (b) above, will be done at a price to be agreed upon previously in writing by the contractor and the Engineer and approved by the Owner. Where a unit price or lump sum cannot be agreed upon by both parties or where this method of payment is impracticable, the Owner may order the contractor to do such additional work on a "force-account" basis.

   d. **Force-Account Work**: All additional work done on a "force-account" basis shall be paid for as follows:

      Actual net cost in money to the contractor of the materials and of the wages of
applied labor (including premiums for Workmen's Compensation Insurance), required for such changes and alterations, plus such rental for plant and equipment (other than small tools) required and approved for such changes and alterations, plus twenty percent (20%) of the cost of materials and labor as compensation for all other items of profit and costs or expenses, including administration, overhead, superintendence, insurance (other than Workmen's Compensation Insurance), materials used in temporary structures, allowances made by the contractor to the subcontractors, additional premiums upon the Performance Bond of the contractor and use of small tools. The provision hereof shall not affect the power of the contractor to act in case of emergency as herein provided. The Owner shall have the right to examine the books and records of the contractor relative to the cost figures in the work referred to above. Equipment rental rates shall be negotiated prior to the commencement of the work.

37. Owner's Right to Occupy Works

The right to occupy the whole or any portion of the works at any time prior to completion of the contract is reserved by the Owner. In case of said occupation of the works, the contractor shall proceed with the completion of the contract in such a manner as to cause the least possible interference with the Owner's employees, or others having business on the works.

The installation of equipment or work under other contracts shall not be interpreted as occupation of the works.

38. Delays and Extension of Time

If the contractor is delayed at any time in the progress of the work by any of the following, the time of completion shall be extended for a reasonable time:

a. By any act or neglect of the Owner, its agents or employees.

b. By any separate contractor employed by the Owner.

c. By changes ordered in the work.

d. To unforeseeable cause beyond the control and without the fault of negligence of the contractor including, but not restricted to, acts of God or of the public enemy, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes and unusually severe weather.

e. To any delays of subcontractors occasioned by any of the causes specified in the above items (a), (b), (c), and (d).

Any claim for extension of time shall be made in writing to the Owner and Engineer within seven (7) days of the occurrence of the event giving rise to the claim.
39. **Guarantee of Work**

   a. All work shall be guaranteed by the contractor against defects resulting from the use of inferior or defective material, equipment, or workmanship for two (2) years from the date of final completion of the contract, or from full occupancy of the project by the Owner, whichever is earlier.

   b. If, within the guarantee period, repairs or changes are required in connection with guaranteed work rendered necessary as the result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the contract, the contractor, promptly upon receipt of written notice and without expense to the Owner, shall place in satisfactory condition in every particular all such guaranteed work, correct all defects therein and make good, in a reasonable manner, all damage to the project.

   c. If the contractor, after notice, fails to proceed promptly to comply with the terms of the guarantee, the Owner may have the defects corrected and the contractor shall be liable for all expense incurred.

   d. All work covered by special guarantees applicable to definite parts of the work that may be stipulated in the specifications or other papers forming a part of the contract shall nevertheless be subject to the terms of this section during the life of such special guarantee.

40. **Indemnification**

   The contractor shall indemnify and save harmless the Owner and the Engineer and their agents, officers and employees from and against all claims, damages, losses, liability, and expenses including attorney's fees arising out of or resulting from the performance of the project, provided that any such claim, damage, loss, liability or expense (a) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the project itself) including the loss of use resulting therefrom and (b) is caused in whole or in part by any negligent act or omission of the contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

   In any and all claims against the Owner or the Engineer or any of their agents, officers, or employees by any employee of the contractor and subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this Section shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the contractor or any subcontractor under Workmen's Compensation Acts, Disability Benefit Acts or other Employee Benefit Acts.

   The obligation of the contractor under this Section shall not extend to the liability of the Engineer, his agents, officers, or employees arising out of (a) the preparation or approval of
maps, drawings, opinions, reports, surveys, change orders, designs, or specifications or (b) the giving of or the failure to give directions or instructions by the Engineer, his agents, officers or employees provided such giving or failure to give is the primary cause of injury or damage.

41. Cleaning Up

The contractor shall at all times keep the premises free from accumulations of waste material or rubbish caused by his employees or work, and at the completion of the work he shall remove all his rubbish from and about the site and all his tools, equipment, and surplus materials and shall leave his work broom-clean or its equivalent, unless more exactly specified. In case of dispute, the Owner may remove the rubbish and charge the cost to the contractor as the Engineer shall determine to be just.

42. Uncorrected Work

If the Owner or Engineer deem it inexpedient to correct work not done in accordance with the contract, an equitable deduction from the contract price shall be made therefore.

43. Liens

Neither the final payment or any part of the retain percentage shall become due until the contractor, if required, shall deliver to the Owner a complete release of all liens arising out of this contract, or receipts in full in lieu thereof and, if required in either case, an affidavit that so far as he has knowledge or information the releases and receipts include all the labor and material for which a lien could be filed; but the contractor may, if any subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Owner, to indemnify him against any lien. If any lien remain unsatisfied after all payments are made, the contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such a lien, including all costs and a reasonable attorney's fee.

44. Contractor's Claim

Neither the contractor nor the surety shall be entitled to present any claim or claims to the Owner either during the prosecution of the work or upon completion of the contract, for additional compensation for any work performed which was not covered by the approved drawings, specifications, and/or contract, or for any other cause, unless he shall give the Owner due notice of his intention to present such claims as hereinafter designated.

The written notice, as above required, must have been given to the Owner, with a copy to the Engineer, prior to the time the contractor shall have performed such work or that portion thereof giving rise to the claim or claims for additional compensation; or shall have been given within ten (10) days from the date the contractor was prevented, either directly or indirectly by the Owner of his authorized representative, from performing any work provided by the contract, or within ten (10) days from the happening of the event, thing, or occurrence giving rise to the alleged claim.
45. **Arbitration**

All claims, disputes, and other matters in question arising out of, or relating to, this contract or the breach thereof except for claims which have been waived by final payment in accordance with Section 46, shall be decided by arbitration. This agreement to arbitrate shall be enforceable.

The Board of Arbitrators shall consist of three (3) members. Each party shall appoint one arbitrator and shall advise the other party thereof in writing, sent by registered mail. Thereafter, a third member shall be selected by the two so appointed.

The arbitrators shall proceed with diligence to hear the matter and the parties shall have a full opportunity to present testimony. The award shall be made by the arbitrators, or a majority of them, and shall be binding upon the parties, subject to appeal to the courts as provided by the laws of Pennsylvania.

The arbitrators shall fix their own compensation, unless otherwise provided by agreement, and shall assess the costs and charges of the proceedings upon either or both parties.

The contractor will carry on the work and maintain the progress scheduled during any arbitration proceedings unless otherwise agreed by the parties in writing.

46. **Acceptance of Final Payment Constitutes Release**

The acceptance by the contractor of the Final Payment shall be and shall operate as a release to the Owner of all claims and of all liability to the contractor for all things done or furnished in connection with this work and for every act and neglect of the Owner and others relating to or arising out of this work, excepting the contractor's claims for interest upon the Final Payment, if this payment is improperly delayed. No payment, however final or otherwise, shall operate to release the contractor or his sureties from any obligation under this contract or the performance bond.

47. **No Waiver of Legal Rights**

The Owner or the Engineer shall not be precluded or stopped by any erroneous measurements, estimate or certificate, made or given by them, or any agent or employee of the Owner or Engineer, under any provision or provisions of the contract at any time, either before or after the completion and acceptance of the work and payment therefore, from showing the true and correct amount and character of the work performed and materials furnished by the contractor, or from showing at any time that any such measurement, estimate, or certificate is untrue or incorrectly made in any particular, or that the work or materials, or any part thereof do not conform in fact to the specifications and contract. The Owner shall have the right to reject the whole or any part of the work or materials, should any measurements, estimates, certificate, or payment be found or be known to be inconsistent with the terms of the contract, or otherwise improperly given. The Owner shall not be precluded or stopped notwithstanding any such measurement, estimated, certificate, or payment in accordance therewith, from demanding and recovering from the contractor
and/or his surety such damage as it may sustain by reason of his failure to comply with the terms of the specifications and contract, or on account of any overpayment or overpayments made on any estimate or certificate. Neither the acceptance of the Owner, the Engineer, or any agent or employee of the Owner or Engineer, nor any estimate or certificate by the Engineer, for any payment of money, nor any payment for, nor acceptance of the whole or any part of the work by the Owner or Engineer, nor any extension or remission of time, nor any possession taken by the Owner or ties employees, shall operate as a waiver of any portion of the contract of any power herein reserved by the Owner, or any right to damages herein provided, nor shall any waiver of any breach of the contract be held to be a waiver of any other or subsequent breach.

48. **Liquidated Damages**

The Contractor agrees that side work shall be prosecuted regularly, diligently, and uninterruptedly at such rate of progress as will insure completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and Owner that this time for the completion of the work described herein is reasonable, taking into consideration the average climatic conditions prevailing in this locality.

If the said Contractor shall neglect, fail or refuse to complete the work within the time herein specified, then the Contractor does hereby agree, as a part consideration for the awarding of this Contract, to pay to the Owner the amount of $1,000.00 per day, not as a penalty but as a liquidated damages for such breach of Contract, for each and every consecutive calendar day, including Saturdays, Sundays, and Holidays, that the Contractor shall be in default after time stipulated in the contract.
SPECIAL CONDITIONS

1. TIME OF COMPLETION AND WARRANTY

The CONTRACTOR covenants and agrees that all work (including, but not limited to, all labor performed and all materials supplied) on this PROJECT shall be performed and completed to the satisfaction of the OWNER on all portions of the project on or before the expiration of 180 calendar days after written Notice to Proceed with work has been given by the OWNER. If for any reason, except as provided in the GENERAL CONDITIONS, the CONTRACTOR fails to complete the done work on this PROJECT to the satisfaction of the ENGINEER within the aforementioned time allowed, the OWNER shall deduct from any sums due or which may become due the CONTRACTOR ($1,000.00) for each calendar day used in excess of the aforementioned number of days allowed, or, in case a completion date is fixed, for each calendar day elapsing between the completion date and the actual date of completion. If no sums are due the CONTRACTOR, the CONTRACTOR agrees to remit to the OWNER the aforementioned sum for each day used in excess of the time allowed for completion of the PROJECT. The amounts deducted or remitted under this paragraph are liquidated damages not penalties.

The CONTRACTOR covenants and agrees to Provide a 2-YEAR Maintenance and Warranty Bond for this project, effective from the Completion and Date of Acceptance.

2. STEEL PRODUCTS PROCUREMENT ACT

In accordance with Act No. 3 of the 1978 General Assembly of the Commonwealth of Pennsylvania, approved March 3, 1978, if any steel products are to be used or supplied in the performance of the contract, a “Manufacturer’s Certificate of Compliance” (See General Conditions Article 8) shall be presented that only steel products produced in the United States as defined therein shall be used or supplied in the performance of the contract or any subcontracts thereunder.

3. FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT

All Contractors shall comply with the Federal Occupational Safety and Health Act of 1970.

Each Contractor and all subcontractors pursuant to the Contract shall at all times comply with all applicable Federal, State and Local laws, provisions, and policies governing Safety and Health, including the Federal Register Chapter XVII, Part 1926 of title 29 code of Federal Regulations, Occupational Safety and Health Regulations for Construction, and all subsequent replications updating these regulations.

Each Contractor and all subcontractors pursuant to the contract shall have the sole responsibility to take any and all needed action as reasonably necessary to protect the life, health, and general occupational welfare of all personnel on the job, as well as the general public in and around the construction site.
## SECTION 01000

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END OF SECTION
SECTION 01001

SPECIAL PROVISIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES:

A. Special Provisions related to the Technical Specifications.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment, machinery, apparatus and tools, and perform all operations necessary to install, equip and put in to satisfactory operation, the work specified herein and shown on the Drawings.

All work shall be done in accordance with applicable portions of the Specifications. Any labor, materials, equipment, or apparatus not specifically mentioned herein or shown on the Drawings, which may be necessary for the proper completion of the entire work or of the individual items thereof, within the intent of these Specifications and Drawings, shall be furnished by the Contractor without additional compensation.

B. All work described in these Specifications and as shown on the Drawings shall be conducted in a manner to avoid any and all interruption of the current operations at the Canonsburg Town Park. Contractor shall prepare a detailed work schedule and submit to Owner and Engineer for review and approval.

If interruptions must be made by the Contractor to the existing site functions, the Contractor shall notify the Owner and the Engineer in formal writing concern the known interruptions.

3.2 SPECIFICATIONS INCORPORATED BY REFERENCE

The latest edition of the Pennsylvania Department of Transportation (PennDOT) Publication 408 Specifications, and all supplements thereto, are incorporated by reference into these Technical Specifications.

3.3 STANDARD DRAWINGS INCORPORATED BY REFERENCE

The latest edition of the Pennsylvania Department of Transportation (PennDOT) Standard Drawings are incorporated by reference into these Technical Specifications.

3.4 LOCAL ROADS
A. The Contractor shall cooperate with municipal officials in maintaining safe and passable conditions on all roads, streets, and alleys affected by the work. Detours may be established only with written approval of officials having jurisdiction. A copy of such approval must be submitted to the Owner’s Representative and approved by him before becoming effective. Nothing in this section shall operate to release the Contractor from his responsibilities under his Surety Bond.

3.5 EXISTING UTILITIES

A. The Contractor is cautioned of the existence in the project area of underground utility lines. Every reasonable effort has been made to show the existence and location of the known utility lines in the general area of project construction. However, this information cannot be guaranteed as being accurate.

The depth and size of all existing utilities in the project area shall be verified in the field by the Contractor with a representative from the appropriate utility company. The Contractor shall be responsible for notifying all utility companies at least seventy-two (72) hours before any work commences on this project.

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1-800-242-1776

3.6 ENGINEERING STAKES

A. The Contractor is responsible for the stakeout of all construction work included in this Contract. The Contractor shall furnish the Engineer with such assistance as he may require in checking any alignment, elevation or measurement of the Contractor’s work.

B. The Contractor is responsible to establish appropriate control stakes to establish roadway alignment and installation of proposed utilities per design locations.

3.7 AS-BUILT PLANS

A. The Contractor is required to maintain accurate and complete logs of his work of any locations where the proposed work is revised from that shown on the Plans. This shall include dimensions to show surface features. All revisions will be noted on a set of Plans in a neat fashion. The Contractor shall give these to the Engineer at the completion of the work so that the Engineer can prepare "As-Built" Plans for the Owner.

PART 4 - BASIS OF PAYMENT

4.1 Special Provisions – Incidental. No additional compensation.

END OF SECTION
SECTION 01090

REFERENCE STANDARDS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Quality assurance.

B. Schedules of references.

1.2 QUALITY ASSURANCE

A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date of Contract Documents.

C. Obtain copies of standards when required by Contract Documents.

D. Should specified reference standards conflict with Contract Documents, request clarification from the Engineer before proceeding.

E. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.3 REFERENCES

AA  Aluminum Association
  818 Connecticut Avenue, N.W.
  Washington, DC 2006

AABC  Associated Air Balance Council
  1000 Vermont Avenue, N.W.
  Washington, DC 20005

AASHTO American Association of State Highway and Transportation Officials
  444 North Capitol Street, N.W.
  Washington, DC 20001

ACI  American Concrete Institute
  Box 19150
  Reford Station
  Detroit, MI 48219
ADC  Air Diffusion Council  
230 North Michigan Avenue  
Chicago, IL  60601

AIA  American Institute of Architects  
1735 New York Avenue, N.W.  
Washington, DC  20006

AISC  American Institute of Steel Construction  
400 North Michigan Avenue  
Eighth Floor  
Chicago, IL  60611

AISI  American Iron and Steel Institute  
1000 16th Street, N.W.  
Washington, DC  20036

AMCA  Air Movement and Control Association  
30 West University Drive  
Arlington Heights, IL  60004

ANSI  American National Standards Institute  
1430 Broadway  
New York, NY 10018

APA  American Plywood Association  
Box 11700  
Tacoma, WA  98411

ARI  Air-Conditioning and Refrigeration Institute  
1815 North Fort Myer Drive  
Arlington, VA  22209

ASHRAE American Society of Heating, Refrigerating and Air Conditioning Engineers  
1791 Tullie Circle, N.E.  
Atlanta, GA  30329

ASME  American Society of Mechanical Engineers  
345 East 47th Street  
New York, NY  10017

ASTM  American Society for Testing and Materials  
1916 Race Street  
Philadelphia, PA  19103

AWWA  American Water Works Association  
6666 West Quincy Avenue  
Denver, CO  80235
AWI  Architectural Woodwork Institute  
2310 South Walter Reed Drive  
Arlington, VA  22206

AWPA  American Wood-Preservers’ Association  
7735 Old Georgetown Road  
Bethesda, MD  20014

AWS  American Welding Society  
550 LeJeune Road  
Miami, FL  33135

CRSI  Concrete Reinforcing Steel Institute  
933 Plum Grove Road  
Schaumburg, IL  60195

EJMA  Expansion Joint Manufacturers Association  
707 Westchester Avenue  
White Plains, NY  10604

FGMA  Flat Glass Marketing Association  
3310 Harrison  
White Lakes Professional Building  
Topeka, KS  66611

FM  Factory Mutual System  
1151 Boston-Providence Turnpike  
Norwood, MA  02062

FS  Federal Specification  
General Services Administration  
Specifications and Consumer Information Distribution Section (WFSIS)  
Washington Navy Yard, Bldg. 197  
Washington, DC  20407

GA  Gypsum Association  
1603 Orrington Avenue  
Evanston, IL  60201

IEEE  Institute of Electrical and Electronics Engineers  
345 East 47th Street

IMIAC  International Masonry Industry All-Weather Council  
International Masonry Institute  
815 15th Street, N.W.  
Washington, DC  20005
MIL  Military Specification  
Naval Publications and Forms Center  
5801 Tabor Avenue  
Philadelphia, PA  19120

ML/SFA  Metal Lath/Steel Framing Association  
221 North LaSalle Street  
Chicago, IL  60601

NAAMM  National Association of Architectural Metal Manufacturers  
21 North LaSalle Street  
Chicago, IL  60601

NEMA  National Electrical Manufacturers’ Association  
2101 L Street, N.W.  
Washington, DC 20037

NFPA  National Fire Protection Association  
1619 Massachusetts Avenue, N.W.  
Washington, DC 20036

PennDOT  Commonwealth of Pennsylvania  
Department of Transportation

PCA  Portland Cement Association  
5420 Old Orchard Road  
Skokie, IL  60077

PS  Product Standard  
U.S. Department of Commerce  
Washington, DC  20203

SDI  Steel Deck Institute  
Box 3812  
St. Louis, MO  63122

SDI  Steel Door Institute  
712 Lakewood Center North  
Cleveland, OH  44107

SMACNA  Sheet Metal and Air Conditioning Contractors’  
8224 Old Court House Road  
Vienna, VA  22180

SSPC  Steel Structures Paint Council  
4400 Fifth Avenue  
Pittsburgh, PA  15213
PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

PART 4 - BASIS OF PAYMENT

Not Used.

END OF SECTION
SECTION 01300

APPROVED EQUAL MATERIALS AND PRODUCTS AND SUBMITTALS

PART 1 - GENERAL

1.1 SECTION INCLUDES:

A. Approved Equal Materials and Products.
B. Submittals.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 DESCRIPTION

A. Wherever possible throughout the Contract Documents, the minimum acceptable quality of workmanship and materials has been defined by the manufacturer’s name and catalog number, reference to recognized industry and government standards, or description of required attributes and performance.

To ensure that the specified products are furnished and installed in accordance with design intent, these procedures have been established for the submission and approval of equal materials and products prior to the opening of bids and the submission and approval of all specified materials and products and duly approved equal materials and products following the award of the Contract.

3.2 APPROVED EQUAL MATERIALS AND PRODUCTS

A. The various materials and products specified in the Contract Documents by name and description are provided to establish a standard of quality. It is not the intent to limit the acceptance to any one material or product specified, but rather to name or describe a material or product as a minimum standard that is desired and acceptable. Where proprietary names are used, whether or not followed by the words "or approved equal", "equal to", or "or equal," equal materials and products may be approved by the Owner’s Representative.

B. Any Bidder who desires to have alternate manufacturer’s equipment considered as equal to that named in these Specifications shall do the following: The Bidder shall submit to the Owner’s Representative three (3) copies of detailed computations, shop drawings, certified, stamped, and sealed by a Registered Pennsylvania Professional Engineer, samples, and/or manufacturer’s literature as required to document that the proposed equal material or product meets or exceeds the Specifications. These shop drawings shall clearly identify and illustrate any discrepancies or revisions required to make the alternate equipment fit, connect, and operate as the intended design, including electrical design and charge requirements. The perspective Bidder and/or alternate manufacturer shall pay all costs to the Owner’s Representative for design engineering and construction costs (if any) required to make the alternate equipment fit and work.
in accordance with these Contract Documents. This shall be done no less than ten (10) days prior to Bid Opening date so the Owner’s Representative has adequate time to review the information submitted.

C. Upon completion of review of this material, the Owner’s Representative shall determine whether the alternate item meets the appropriate Specifications. If the Owner’s Representative feels that the alternate material is acceptable and meets the Specifications, the Owner’s Representative shall notify all perspective Bidders of such by Addendum. By doing this, all Bidders will have the option to formulate their Bid using either the specified item or the “approved equal” item.

D. If the Owner’s Representative deems that an alternate material is not considered equal to that specified, the Owner’s Representative shall notify only the Bidder or manufacturer’s agent who submitted the prequalification material of his denial.

E. The decision of the Owner’s Representative regarding whether to approve an alternate material or item shall be final. There shall be no consideration of alternate items after Bid Opening.

3.3 SUBMITTALS

A. Within ten (10) days after the award of the Contract and before any items are submitted for approval, the Contractor shall submit to the Owner’s Representative three (3) copies of a submittal schedule. The Contractor shall compile a complete and comprehensive schedule of all submittals anticipated during progress of the work. The Contractor shall include a list of each type of item for which Contractor’s drawings, Shop Drawings, Certificates of Compliance, material samples, guarantees, or other types of submittals are required. Upon approval by the Owner’s Representative, this schedule will become part of the Contract and the Contractor will be required to adhere to the schedule except when specifically otherwise permitted.

B. Submittals shall be made for all materials and products used in the Project. The Contractor shall assume all liability for proceeding without approval of the submittals and/or for using materials and products not approved by the Owner’s Representative.

C. Unless the precise color and pattern is specifically described in the Contract Documents, and whenever a choice of color or pattern is available in a specified product, the Contractor shall submit accurate color and pattern charts to the Owner’s Representative for review and selection.

D. The Contractor shall certify that any materials and products used in the work comply with all specified provisions thereof. Certification shall not be construed as relieving the Contractor from furnishing satisfactory materials if, after tests are performed on selected samples, the material is found to not meet specified requirements.

Certification shall be in the form of letter or company standard forms containing all required data. Certificates shall be signed by an officer of the manufacturing or fabricating company.
PART 4 - BASIS OF PAYMENT

4.1 Approved Equal Materials and Products and Submittals-Incidental. No additional compensation.

END OF SECTION
SECTION 01350

PROJECT SCHEDULE

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. The general requirements and procedures for preparing and maintaining the project schedule, including guidelines for the progress schedule, submittals, monthly status reports, and recovery schedule.

1.2 RELATED DOCUMENTS AND SECTIONS

A. Provisions of the Contract Documents shall apply to the work of this section.
B. Section 01300 – Submittals

1.3 MEASUREMENT AND PAYMENT

A. No separate measurement nor payment will be made for work required under this section. All cost in connection therewith will be included in the various bid items.

1.4 SUBMITTALS

A. Comply with Division 1, Section 01300 – Submittals.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.01 PROGRESS SCHEDULE

A. The Contractor shall submit a Progress Schedule as follows:

Submit a detailed List of Activities within five (5) calendar days after effective date of Notice to Proceed showing all activities to be started within the following thirty (30) days. This list shall be updated and resubmitted to the Owner every thirty (30) days during the Contract period, submitted with the contractor’s payment estimate. Show the anticipated starting time, duration and time of completion of all activities required to complete all construction. Identify the anticipated critical path of activities and highlight them on the schedule.

B. Recovery Schedule:

1. If the Owner determines at any time for any reason that the work has fallen behind the Contract schedule or milestone dates, the Contractor shall submit a written and documented Recovery Schedule within seven (7) calendar days of the Owner’s written request. Document in the
Recovery Schedule all additional resources, including materials, equipment and labor, and modifications of operations which will be provided so as to meet the Schedule. Provide all such additional resources and modifications of operations without additional cost to the Owner. Such additional resources and modifications shall include but not be limited to:

a. Required overtime for the Contractor’s personnel.

b. Increased construction manpower in such quantities as will substantially eliminate the backlog of work and put the project back on schedule.

c. Increased numbers of shifts per working day, working days per week, or the amount of construction equipment, or any combination of the foregoing which will put the project back on schedule.

d. Rescheduled activities to achieve the maximum practical concurrence of accomplishment of activities to put the project back on schedule.

e. Supplemental progress schedules detailing the specific operation changes instituted to regain the Contract Schedule.

2. Implement the Recovery Schedule without additional cost to the Owner and provide for completion of the work in accordance with the remaining milestone dates without a time extension. Should the durations of the Recovery Schedule not receive acceptance of the Owner, be responsible to use concurrent operations, additional manpower, additional shifts, overtime, etc., including a 24-hour productive work day, seven (7) day work week operation, as required to put the project back on schedule at no additional cost to the Owner.

3. Material breach of contract shall result from failure to provide the Owner with the required schedules and failure to implement such schedules immediately.

END OF SECTION 01350
SECTION 01500

MOBILIZATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Mobilization.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 This work is the assembly and set-up of the general plant required to comply with the contract and with local and state laws and regulations. General plant includes contractor's offices, shops, plants, storage areas, and sanitary or other facilities, if required. The work includes obtaining the required permits, insurance, bonds, and any other initial items required for the start of the work.

3.2 Provide adequate material and furnishings required. These material and furnishings will not be considered a part of the other completed contract items.

PART 4 - BASIS OF PAYMENT

4.1 Mobilization - Lump Sum in accordance with the following schedule:

A. Whenever work is performed equal to 10% of the total contract price, excluding the bid price for this item, the amount bid for mobilization or 3% of the total contract price, excluding the bid price for this item, whichever is less, will be paid.

B. Whenever work is performed equal to 25% of the total contract price, excluding the bid price for this item, any remaining amount bid for mobilization or an additional 2% of the total contract price, excluding the bid price for this item, whichever is less, will be paid.

C. Upon completion of the project, any remaining amount bid for mobilization will be paid.

END OF SECTION
SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Provisions of the Contract Documents shall apply to all work of this section.

1.02 DESCRIPTION OF WORK

A. Closeout: Regards the general requirements near the end of the Contract Time, in preparation for final acceptance, final payment, normal termination of contract, occupancy by Owner and similar actions indicating completion of the work. Time of closeout is directly related to "Completion," and therefore may be either a single time period for entire work or a series of time periods for individual parts of the work which have been certified as complete at different dates. The completion time variation, if any, shall be applicable to other provisions of this section, regardless of whether resulting from "phased completion" originally specified by the Contract Documents or subsequently agreed upon by the Owner and Contractor.

1.03 RELATED SECTIONS

A. Related work specified in other sections is as follows:

1. Specific requirements for individual units of work: Other Sections.

2. Final payment requirements: Articles of Agreement.

3. General submittal requirements: Section 01300 – Submittals.

1.04 PREREQUISITES TO SUBSTANTIAL COMPLETION

A. General: Prior to requesting from the Owner inspection for Certification of Substantial Completion, for either the entire work or portions thereof, complete the following and list known exceptions in the request:

1. In the progress payment request, coincident with or first following date claimed, shown either 100% completion for portion of work claimed as “substantially complete,” or list incomplete items, value of incompletion, and reasons for being incomplete as indicated in the Contract Documents.

2. Submit statement showing accounting of changes to the Contract sum.
1.05 PREREQUISITES TO FINAL ACCEPTANCE

Not used.

1.06 MEASUREMENT AND PAYMENT

A. No separate measurement nor payment will be made for work required under this section. All cost in connection therewith will be included in the various bid items for this Contract work.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.01 FINAL INSPECTION

A. Final payment is not to be made until such Final Inspection is made and the work is acceptable to the Owner.

3.02 CONTINUING INSPECTIONS

A. Except as otherwise required by specific warranties, agreement to maintain, workmanship/maintenance bonds, and similar continuing commitments, comply with Owner’s requests to participate in inspections at end of each time period of such continuing commitment. Also participate in a general Final Inspection of the work upon completion of the entire project.

3.03 CORRECTION OF WORK BEFORE/AFTER FINAL PAYMENT

A. Promptly remove from premises all work not accepted by the Owner as failing to conform to the Contract, whether incorporated or not. Promptly replace and re-execute work in accordance with the Contract and without expense to the Owner, and bear expense of making good all work that is destroyed or damaged by such removal or replacement.

B. If the Contractor does not remove work which has been rejected by the Owner within a reasonable time as fixed by written notice, the Owner may remove it and store materials at the expense of the Contractor. If the Contractor does not pay expenses of such removal within ten (10) days time thereafter, the Owner may, upon ten (10) days written notice, sell such materials at auction or at private sale and shall account for net proceeds thereof, after deducting all costs and expenses that should have been borne by the Contractor.

C. Neither final payment nor any provision in the Contract Documents shall relieve the Contractor of responsibility for faulty materials or workmanship and shall remedy
any defects due thereto and pay for any damage to other work resulting therefrom which shall appear within a period of one (1) year from the date of final acceptance by the owner. Where guarantees are required by the Contract Documents for longer periods, such longer periods shall apply. The Owner shall give notice of observed defects with reasonable promptness. All questions arising under this article shall be decided by the Owner.

3.04 RECORD DRAWINGS

Not used.

3.05 FINAL CLEAN-UP

A. Contractor shall remove and legally dispose of all construction debris resulting from construction operations from the site. Contractor shall restore and repair all surfaces soiled by construction operations.

B. Removal of Protection: Except as otherwise indicated or requested by Owner, remove temporary protection devices and facilities which were installed during course of the work to protect previously completed work during remainder of project construction periods and those devices and facilities installed to prevent erosion and sediment from leaving the site.

C. Contractor shall clean all equipment, piping, conduit runs, adjacent streets and other equipment requiring cleaning.

D. Contractor shall pay for all costs related to facility and equipment cleaning.

E. The requirements of refuse removal, cleaning and other related work as specified shall be completed prior to the Final Inspection and constitutes one condition of final acceptance.

3.06 CERTIFICATES OF INSPECTION REQUIRED FOR OCCUPANCY

Not used.

3.07 GUARANTEE

A. The Contractor and his sureties shall unconditionally guarantee all work to be performed and all materials to be furnished under the Contract against defects in materials or workmanship for a period of two (2) years from date of final acceptance by the Owner. If a longer guarantee period is specified, the longer guarantee period shall apply.

B. Where guarantees are required for work performed by subcontractors, secure guarantees from said subcontractors addressed to and in favor of the Owner.
C. Delivery of said guarantees shall not relieve the Contractor or his sureties from any obligation assumed under other provisions of the Contract Documents.

D. Should defects develop in any work within periods specified in the Contract Documents, due to faults in materials and/or workmanship, make repairs and do necessary work to correct defective work so that it fully complies with the Contract Documents, to the satisfaction of the Owner. Perform such repairs, corrective work, including replacing of other work damaged by or otherwise affected by making of repairs or corrective work, or which may have been damaged by defective work, without extra cost to the Owner, starting within ten (10) days after written notice to the Contractor by the Owner. Complete such repairs or corrective work as rapidly as possible.

E. In case the Contractor or his surety fail to do work so ordered, the Owner may have work done and charge the cost thereof against moneys retained, as provided for in the Contract Documents. If said moneys are insufficient to pay such cost, or if no money is available, the Contractor and his surety agree to pay to the Owner such an amount as will fully reimburse the Owner for such work.

F. Guarantees required by the Contract Documents shall be delivered in quadruplicate to the Owner before final voucher on the Contract is issued. The time of the guarantees shall begin the date of final acceptance, even though guarantees are delivered prior thereto.

END OF SECTION 01700
SECTION 02100

DEMOLITION, CLEARING AND GRUBBING

PART 1 - GENERAL

1.01 SCOPE

A. Work included:

Demolition, clearing and grubbing required for this Work includes, but is not necessarily limited to: removal of concrete, cutting, patching, etc.; site clearing; demolition and removal of miscellaneous items which are designated to be removed and/or are not necessary for the proper functioning of the new facilities, unless these items are designated to remain or so directed by the Engineer; removal of various items as is necessary for the proper performance of the Work; and removal of all debris.

B. Definitions:

The term "demolition, clearing and grubbing" as used herein includes the removal of all existing objects (except for those objects designated to remain) down to the existing ground level or removal of existing structures both above and below ground and disposal of same, plus such other Work as is indicated on the Drawings and/or required by these Specifications.

1.02 RESPONSIBILITY AND LIABILITY FOR INTERFERENCE WITH UTILITIES AND OTHER STRUCTURES

A. It is the responsibility of the Contractor to contact the Owners of the various utilities in this area prior to starting work on this Project, and also during construction, and to determine the exact location of any structures, gas or water mains, electric or telephone conduits, sewer lines, drainage facilities and all service lines the utilities may have at the site of the Work so that he may locate and protect them, whether or not such structures or utilities are shown on the Drawings.

B. The Contractor shall assume full responsibility and liability for all property damage and bodily injury that may result from his damaging or disturbing any structures, drainage facilities, water and gas mains, electric conduits, sewer lines, or other facilities of the utilities present at the site of the work.

C. The Contractor shall be responsible for all damages to utilities, structures, power lines, gas, water and drain lines, sewers, underground conduits, or other facilities that may result from his operations and shall restore same to their original condition as soon as possible.
1.03 PROPERTY RESTORATION

The Contractor shall be responsible for all damages to public and private properties, structures, fences, lawns, landscape plantings, sidewalks, or other surface features of the Owner's property or that of others that may result from his operations and shall restore same to their original condition as soon as possible and prior to completion of his Contract.

1.04 JOB CONDITIONS

A. The Contractor shall use all means necessary to prevent the spread of dust during performance of the Work of this Section and shall thoroughly moisten all surfaces as required to prevent dust from being a nuisance to the public, neighbors or concurrent performance of other Work on the site.

B. Burning:

On-site burning will not be permitted without advance approval of the Owner and the Engineer.

PART 2 - PRODUCTS

2.01 TEMPORARY BARRICADES

Unless otherwise specifically approved by the Owner, the Contractor shall use only new and solid lumber of utility grade or better to construct temporary barricades around open excavations, new construction work, around the objects designated to remain, or where otherwise required.

PART 3 - EXECUTION

3.01 PREPARATION

A. Electric power lines:

The Contractor is hereby notified that the proposed work may be in close proximity to overhead high voltage power lines. It is the Contractor's responsibility to take such precautions as are necessary or required and to inform his personnel and any Subcontractors of and enforce all safety rules, regulations and procedures as necessary or required to protect the workmen and the facilities or operations of the respective utilities when working near such power lines. The Contractor shall assume full responsibility and liability for all property damage and bodily injury that may result from his or his Subcontractor's personnel contacting directly or indirectly overhead high voltage electric lines.
B. Notification:

The Contractor shall notify the Owner at least two (2) full working days prior to commencing the work of this Section.

C. Site Inspection:

1. Prior to all Work of this Section, the Contractor shall carefully inspect the entire site and all objects designated to be removed or to be preserved.

2. The Contractor shall locate all existing utility lines and determine all requirements for disconnecting and capping.

3. The Contractor shall locate all existing active utility lines traversing the site and determine the requirements for their protection.

D. Clarification:

1. The Drawings do not purport to show all objects existing on the site.

2. Before commencing the Work of this Section, the Contractor shall verify with the Engineer all objects to be removed and all objects to be preserved.

E. Scheduling:

1. The Contractor shall schedule all Work in a careful manner with all necessary consideration for neighbors and the public.

2. The Contractor shall avoid interference with the use of, and passage to and from, adjacent buildings and facilities.

F. Protection of utilities:

The Contractor shall preserve in operating condition all active utilities traversing the site.

3.02 DEMOLITION OF STRUCTURES

A. The Contractor shall demolish and remove all sections of structures or complete structures designated for demolition or as required for the performance of the Work.

B. Care shall be exercised not to damage structures or facilities designated to be preserved or not specifically designated for demolition. Any such damage shall be promptly repaired by the Contractor to restore the damaged structures or facilities to a condition at least as good as existed prior to such damage.
3.03 SALVAGED MATERIALS

A. No materials salvaged from the demolition Work will be reused in this Project without the expressed permission of the Engineer.

B. All other materials salvaged from demolition work shall become the property of the Contractor (or owner if marked as such) and he shall dispose of them in a legal and responsible manner, off the site, as he sees fit. No on-site disposal of mechanical piping, equipment, etc., or sales will be permitted.

3.04 PROCEDURES

A. The Contractor shall comply with all applicable local, State and Federal safety regulations and shall furnish, install, erect and/or remove all fences, guard rails, enclosure chutes, catch platforms and shoring necessary for human safety and property protection. The Contractor shall be especially careful where Work being demolished is adjacent to Work, structures or facilities which are to remain.

B. The Contractor shall note that certain facilities which are to be abandoned in place following completion will require cleaning and sealing and shall perform such Work as may be required to accomplish this with regard to the Work Schedule, particularly as it relates to maintaining such facilities in service until new Work is completed and placed into service.

C. After demolition of substructure facilities, the Contractor shall fill any cavities and bring the grade to the elevations indicated on the Drawings, all in accordance with the requirements of these Specifications.

D. Any damage to structures or facilities which are to remain in use shall be the responsibility of the Contractor and he shall repair same to the satisfaction of the Engineer.

E. In clearing the Work site of trees, shrubs and surface vegetation, the Contractor shall observe care not to damage any structures, utilities, property or persons. Only those trees, shrubs, etc. which are absolutely required to be removed to permit construction activities to proceed shall be removed. The Contractor shall preserve as many existing trees and shrubs as possible and shall not remove any trees larger than 3 inches in diameter measured at one foot above the ground without the advance approval of the Engineer.

END OF SECTION 02100
SECTION 02230

SITE PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Design Drawings.

1.2 SECTION INCLUDES
   A. Furnish all labor, material and equipment to clear project construction area as needed.
   B. Work shall include (as applicable), but not be limited to, the following:
      1. Tree Removal
      2. Pavement, Curb, and Sidewalk Removal
      3. Miscellaneous Appurtenance Removal
      4. Top Soil Removal/Storage
      5. Salvage
      6. Disposal

1.3 NOT USED

1.4 NOT USED

1.5 REGULATORY REQUIREMENTS
   A. Conform to applicable Federal, State, and Local codes for disposal of debris. No burning on site will be permitted.
   B. Coordinate clearing Work with respective utility companies as applicable.

1.6 JOB CONDITIONS
   A. Dust Control: Use all means necessary to control dust on and near the Work and on and near all off-site borrow areas if such dust is caused by the Contractor's operations during performance of the Work or if resulting from the condition in which the Contractor leaves the site.
   B. Thoroughly moisten all surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other work on the site.
   C. No tracking of dirt, mud, or debris onto streets or state highways shall be allowed. Any such occurrence shall be cleaned immediately.
   D. Contractor shall verify locations of all underground utilities.

1.7 PROTECTION
   A. Protect utilities that remain from damage.
   B. Protect trees, plant growth, and features designated to remain as final landscaping.
C. Protect benchmarks and existing structures from damage or displacement.
D. Protect fences, guide rail, shrubbery, trees, signs and any other items removed and designated to be preserved for reuse.

PART 2 - PRODUCTS
A. Products shall be used as needed to perform Site Preparation activities. Products shall be approved by the Owner or Owner’s Representative.

PART 3 - EXECUTION
3.1 GENERAL
A. When working within temporary or permanent Rights-of-Way, use every means possible to protect from injury and damage all property, including trees, shrubbery, lawns, fences, buildings, walls, roads, water courses, natural features or any improvements thereto which may exist. Do not willfully or maliciously injure or destroy trees, shrubs, or vegetation, and do not remove or cut them without permission of the Owner or Owner’s Representative.
B. All operations must be confined to the width of the Rights-of-Way secured by the Authority from the Owner. All damage done to property resulting from the Contractor’s negligence shall be repaired without charge to the satisfaction of the Owner with the exception of those items (trees, shrubs, etc.) that must be removed for construction and have been agreed upon beforehand, in writing, with the Owner or Owner’s Representative.

3.2 VIDEO TAPING/PROGRESS PHOTOS
A. Based on the type and location of Rights-of-Way, the Owner may require video taping of site and, if so, will specify. Progress photos will be required by the Owner.

3.3 CLEARING
A. Clear areas required for access to site and execution of Work. Work includes removal of trees, shrubs, fences, foundations, structures, paving, debris, trash and other obstructions.
B. Limits of clearing shall be kept to a minimum and follow civil site plans.
C. No trees or vegetation shall be removed or altered within PennDOT’s Right-of-Way unless a separate specific permit is obtained.
D. No trees shall be removed within the construction zone or Rights-of-Way except the following:
   1. Trees within an excavated area such as footing or trench.
   2. Trees whose root system will be destroyed by the excavation.
   3. Trees that interfere with the movement of the Contractor’s equipment with the approval of the Owner or Owner’s Representative. Any trees that interfere with the movement of the Contractor’s equipment shall be reviewed by the Owner or Owner’s Representative before they are removed.
   4. All trees bordering any construction zone or Right-of-Way shall be protected by acceptable methods. Trees damaged by the Contractor will
be either repaired or replaced as determined by the Owner or Owner’s Representative at the Contractor’s expense.

E. Shrubbery within the areas to be cleared shall be removed and preserved for replanting (if indicated on plans).

F. All debris and organic material produced in clearing shall be removed from the work zone to preclude being used as backfill material.

G. Stripping Topsoil: Strip topsoil from within the limits of earthwork operations as specified. Topsoil shall be a fertile, friable, natural topsoil of loamy character. Topsoil shall be capable of growing healthy horticultural crops of grasses. Stockpile topsoil as indicated on Construction Drawings. To extent possible, eliminate foreign materials, such as weeds, roots, stones, subsoil, frozen clods, and similar foreign materials larger than ½ cubic foot in volume, from soil as it is stockpiled.

3.4 TRIMMING OF TREES

A. When required, with the Owner or Owner’s Representative’s approval, trees shall be trimmed to remove branches or roots that interfere with construction or traffic. Paint all cut branches and roots with wound paint as recommended for the application.

3.5 FENCES, GUIDE RAIL, SIGNS AND PARKING METERS

A. Contractor shall carefully remove and preserve for reinstallation all fences, guide rails, signs, mailboxes and parking meters which interfere with Work within the Rights-of-Way.

B. All items damaged during removal, and unsuitable for reuse shall be replaced by the Contractor at no expense to the Owner.

3.6 SALVAGE

A. Material, that is to be salvaged as a result of the clearing operations, shall include the following items, which are to be turned over to the property owner if the property owner so desires.

1. Parts suitable for use as mulch.
2. Live plants suitable for replanting.

B. All salvageable material not desired by the property owner shall be removed as part of the Work.

3.7 DISPOSAL

A. Burning of materials on the site will be controlled by local codes or ordinances.

B. Removal:

1. Material to be removed shall be removed from the site as it accumulates.
C. Dumping:

1. Prior to depositing surplus material at any off-site location, the Contractor shall obtain a written agreement between himself and the Owner of the property on which the disposal is proposed. The agreement shall state that the Owner of the property gives permission for the Contractor to enter and deposit the material at no expense to the Owner. A copy of the agreement shall be furnished to the Owner or Owner’s Representative. Contractor’s disposal shall comply with all Federal, State, and Local laws and regulations. Disposal of surplus material within PennDOT’s Rights-of-Way is prohibited. All surplus material must be disposed of as the Work progresses and shall not be stored on PennDOT’s Rights-of-Ways for future removal.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Site preparation shall be paid as a lump sum line item as indicated on the Project Bid Sheet.

END OF SECTION
SECTION 02270

SOIL EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

A. Refer also to Soil and Erosion Sedimentation Control Plan as approved by the Washington County Conservation District Office, and all permits or related instructions, and the latest version of the Erosion and Sediment Pollution Control Program Manual published by the Commonwealth of Pennsylvania Department of Environmental Protection, Office of Resources Management, Bureau of Soil and Water Conservation, Division of Soil Resources and Erosion Control

1.1 Section Includes

A. Soil Erosion and Sedimentation Control

1.2 Submittals

A. Submit manufacturer's certifications of materials to the Engineer.

PART 2 - PRODUCTS

2.1 All materials shall meet the requirements of the latest edition of the Erosion and Sediment Pollution Control Program Manual published by the Commonwealth of Pennsylvania Department of Environmental Protection, Office of Resources Management, Bureau of Soil and Water Conservation, Division of Soil Resources and Erosion Control.

PART 3 - EXECUTION

3.1 Construct and maintain all measures required by the Soil Erosion and Sedimentation Control Plan attached to these Specifications and as indicated in the Plans. Remove all temporary measures after completed restorations have taken place to the acceptance of the owner.

END OF SECTION
SECTION 02300
EARTHWORK

PART I – GENERAL

1.1 SECTION INCLUDES

A. Protection, modification, or installation of utilities as site work progresses with particular attention to grade changes and necessary staging or phasing of work.

B. Cutting, filling, and grading to required lines, dimensions, contours, and elevations for proposed improvements.

C. Scarifying, compacting, drying, dewatering and removal of unsuitable material to ensure proper preparation of areas for fills or proposed improvements.

1.2 RELATED SECTIONS

A. Section 02230 - Site Preparation

B. Section 02310 – Earthwork for Utilities

C. Section 02486 – Finish Grading and Seeding

1.3 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM) latest edition

1. D422 Standard Test Method For Particle – Size Analysis of Soil

2. D 698 Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN.m/m3))

3. D 1557 Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 Kn.m/m3))

4. D 2216 Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures

5. D 2487 Classification of Soils for Engineering Purposes

6. D 2922 Density of Soil and Soil-Aggregate In Place by Nuclear Methods (Shallow Depth)

7. D 3017 Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

8. D 4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils
B. American Association of State Highway and Transportation Officials (AASHTO) latest edition

1. T 88 Particle Size Analysis of Soils

1.4 QUALITY ASSURANCE

A. An independent testing laboratory, selected and paid by Owner, may be retained to perform construction testing on site.

1. The independent testing laboratory shall prepare test reports that indicate test location, elevation data, and test results. Owner and/or Owner’s Representative and Contractor shall be provided with copies of reports within 96 hours of time that test was performed. In event that test performed fails to meet Specifications, the independent testing laboratory shall notify Owner and Contractor immediately.

2. Costs related to retesting due to failures shall be paid for by Contractor at no additional expense to Owner. Contractor shall provide free access to site for testing activities.

3. Quality assurance testing shall be in accordance with Part 3, Section 3.08, “Field Quality Control”.

1.5 SUBMITTALS

A. Submit 30-pound sample of each type of off-site fill material that is to be used at the site in airtight container(s) for the independent testing laboratory or submit gradation and certification of aggregate material that is to be used at the site to the independent testing laboratory for review.

B. Submit name of each material supplier and specific type and source of each material. Change in source throughout project requires approval of Owner.

C. If fabrics or geogrids are to be used, design shall be submitted for approval to Owner.

D. Submit Dewatering Plans upon request by Owner.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Excavated and re-used material for subsoil fill as specified herein. Fill material shall be free of topsoil, organic matter, slag, red-dog, pyritic/carbonaceous material, coal, and other deleterious material.
B. Aggregate fill as specified.

C. Imported fill material approved by the Owner and/or Owner’s Representative and specified herein.

D. Topsoil fill as specified.

E. Acceptable stabilization fabrics and geogrids as specified.

F. Filter and drainage fabrics as specified.

2.2 EQUIPMENT

A. Transport off-site materials to project using well-maintained and operating vehicles. Once on site, transporting vehicles shall stay on designated haul roads and shall at no time endanger improvements by rutting, overloading, or pumping.

2.3 SOURCE QUALITY CONTROL

A. In areas to receive pavement, California Bearing Ratio (CBR) or Limerock Bearing Ratio (LBR) test shall be performed for each type of material that is imported from off-site.

B. Following tests shall be performed as part of construction testing requirements on each type of on-site or imported soil material used as compacted fill:
   1. Moisture and Density Relationship: ASTM D 698 (or ASTM D 1557)
   2. Mechanical Analysis: AASHTO T 88 (or ASTM D422)
   3. Plasticity Index: ASTM D 4318

PART 3 - EXECUTION

3.1 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Locate and identify existing utilities that are to remain and protect from damage.

C. Notify utility companies to remove or relocate public utilities that are in conflict with proposed improvements.

D. Protect plant life, lawns, fences, existing structures, sidewalks, paving, and curbs, unless otherwise noted on construction drawings from excavating equipment and vehicular traffic.

E. Protect benchmarks, property corners, and other survey monuments from damage or displacement. If marker needs to be removed it shall be referenced by licensed land surveyor and replaced, as necessary, by same.
F. Remove from site, material encountered in grading operations that, in opinion of the Owner and/or Owner’s Representative, is unsuitable or undesirable for backfilling, subgrade, or foundation purposes. Dispose of in manner satisfactory to Owner. Backfill areas with layers of suitable material and compact as specified herein.

G. Prior to placing fill in low areas, such as previously existing creeks, ponds, or lakes, perform following procedures:

1. Drain water out by gravity with ditch having flow line lower than lowest elevation in low area. If drainage cannot be performed by gravity ditch, use adequate pump to obtain the same results.

2. After drainage of low area is complete, remove mulch, mud, debris, and other unsuitable material by using acceptable equipment and methods that will keep natural soils underlying low area dry and undisturbed.

3. All muck, mud, and other materials removed from low areas shall be dried on-site by spreading in thin layers for observation by the Owner and/or Owner’s Representative. Material shall be inspected and, if found to be suitable for use as fill material, shall be incorporated into lowest elevation of site filling operation, but not under building subgrade or within 10'-0" of perimeter of building subgrade or paving subgrade. If, after observation by the Owner and/or Owner’s Representative, material is found to be unsuitable, unsuitable material shall be removed from site.

H. Dewatering:

1. General:
   a. Design and provide dewatering system using accepted and professional methods consistent with current industry practice to eliminate water entering the excavation under hydrostatic head from the bottom and/or sides. Design system to prevent differential hydrostatic head, which would result in floating out soil particles in a manner, termed as a “quick” or “boiling” condition. System shall not be dependent solely upon sumps and/or pumping water from within the excavation where differential head would result in a quick condition, which would continue to worsen the integrity of the excavation’s stability.

   b. Provide dewatering system of sufficient size and capacity to prevent ground and surface water flow into the excavation and to allow all Work to be installed in a dry condition.

   c. Control, by acceptable means, all water regardless of source and the Contractor is fully responsible for disposal of the water.

   d. Confine discharge piping and/or ditches to available easement or to additional easement obtained by Contractor. Provide necessary permits and/or additional easement at no additional cost to Owner.
e. Control groundwater in a manner that preserves strength of foundation soils, does not cause instability or raveling of excavation slopes, and does not result in damage to existing structures. Where necessary to these purposes, lower water level in advance of excavation, utilizing wells, wellpoints, jet educators, or similar positive methods. The water level as measured by piezometers shall be maintained a minimum of 3 feet below prevailing excavation level.

f. Commence dewatering prior to any appearance of water in excavation and continue until Work is complete to the extent that no damage results from hydrostatic pressure, flotation, or other causes.

g. Open pumping with sumps and ditches shall be allowed, provided it does not result in boils, loss of fines, softening of the ground, or instability of slopes.

h. Install wells and/or wellpoints, if required, with suitable screens and filters, so that continuous pumping of fines does not occur. Arrange discharge to facilitate collection of samples by the Owner. During normal pumping, and upon development of well(s), levels of fine sand or silt in the discharge water shall not exceed 5 ppm. Install sand tester on discharge of each pump during testing to verify that levels are not exceeded.

i. Control grading around excavations to prevent surface water from flowing into excavation areas.

j. No additional payment will be made for any supplemental measures to control seepage, groundwater, or artesian head.

2. Design:

a. Contractor shall designate and obtain the services of a qualified dewatering specialist to provide dewatering plan as may be necessary to complete the Work.

b. Contractor shall be responsible for the accuracy of the drawings, design data, and operational records required.

c. Contractor shall be solely responsible for the design, installation, operation, maintenance, and any failure of any component of the system.

3. Damages:

a. Contractor shall be responsible for and shall repair without cost to the Owner any damage to work in place, or other contractor’s equipment, utilities, residences, highways, roads, railroads, private and municipal well systems, adjacent structures, natural resources, habitat, existing wells, and the excavation. Including, damage to the bottom due to heave and including but not limited to, removal and pumping out of the excavated area that may result from Contractor’s negligence, inadequate or
improper design and operation of the dewatering system, and any mechanical or electrical failure of the dewatering system.

b. Remove subgrade materials rendered unsuitable by excessive wetting and replace with approved backfill material at no additional cost to the Owner.

4. Maintaining Excavation in Dewatering Condition:

a. Dewatering shall be a continuous operation. Interruptions due to power outages, or any other reason will not be permitted.

b. Continuously maintain excavation in a dry condition with positive dewatering methods during preparation of subgrade, installation of pipe, and construction of structures until the critical period of construction and/or backfill is completed to prevent damage of subgrade support, piping, structure, side slopes, or adjacent facilities from flotation or other hydrostatic pressure imbalance.

c. Provide standby equipment on site, installed, wired, and available for immediate operation if required to maintain dewatering on a continuous basis in the event any part of the system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, perform such work as may be required to restore damaged structures and foundation soils at no additional cost to Owner.

d. System maintenance shall include but not be limited to 24-hour supervision by personnel skilled in the operation, maintenance, and replacement of system components, and any other work required to maintain excavation in dewatered condition.

5. System Removal:

a. Remove dewatering equipment from the site, including related temporary electrical service.

b. Wells shall be removed or cut off a minimum of 3 feet below final ground surface, capped, and abandoned in accordance with regulations by agencies having jurisdiction.

3.2 EXCAVATION FOR FILLING AND GRADING

A. Classification of Excavation: By submitting bid, Contractor acknowledges that site has been investigated to determine type, quantity, quality, and character of excavation work to be performed. Excavation shall be considered unclassified excavation, except as otherwise indicated in the Contract Documents. Unclassified excavation shall include removal of all existing man-made and natural obstructions, soils and rock to proposed subgrade elevations, regardless of character of materials and obstructions encountered.
B. When performing grading operations during periods of wet weather, provide adequate dewatering, drainage and ground water management to control moisture of soils.

C. Shore, brace, and drain excavations as necessary to maintain excavation as safe, secure, and free of water at all times.

D. Rock or stone less than 24 inches in largest dimension when mixed with smaller diameter material to create a well-graded fill is acceptable as fill to within 10 feet of the surface of proposed subgrade.

E. Rock or stone with a maximum size of 8 inches in the largest dimension when mixed with smaller diameter material to create a well-graded fill is acceptable as fill within 10 feet of the surface of proposed subgrade.

3.3 FILLING AND SUBGRADE PREPARATION

A. Fill areas to contours and elevations shown on Construction Drawings with unfrozen materials. No topsoil or organic materials shall be used as fill material.

B. Place fills in continuous lifts specified herein.

C. Areas exposed by excavation or stripping and on which subgrade preparations are to be performed shall be scarified to minimum depth of 8-inches and compacted to minimum of 95 percent of maximum density, in accordance with ASTM D 698 (or 92 percent of maximum density, in accordance with ASTM D 1557) at moisture content of not less than 1 percent below and not more than 3 percent above optimum moisture content. These areas shall then be proofrolled to detect areas of insufficient compaction. Proofrolling shall be accomplished by making minimum of 2 complete passes with fully-loaded tandem-axle dump truck with a maximum weight of 20 tons, or approved equal, in each of 2 perpendicular directions while under the supervision and direction of the independent testing laboratory. Areas of failure shall be excavated and recompacted as specified herein.

D. Fill materials used in preparation of subgrade shall be placed in lifts or layers not to exceed 8-inches loose measure and compacted to 95 percent of maximum density, in accordance with ASTM D 698, (or 92 percent of the maximum density, in accordance with ASTM D 1557) at moisture content of not less than 1 percent below and not more than 3 percent above optimum moisture content.

3.4 MAINTENANCE OF SUBGRADE

A. Verify finished subgrades to ensure proper elevation and conditions for construction above subgrade.

B. Protect subgrade from excessive wheel loading during construction, including concrete trucks, dump trucks, and other construction equipment.

C. Remove areas of finished subgrade found to have insufficient compaction density to depth necessary and replace in manner that will comply with compaction
requirements by use of material equal to or better than best subgrade material on site. Surface of subgrade after compaction shall be hard, uniform, smooth, stable, and true to grade and cross-section.

3.5 BORROW AND SPOIL SITES

A. Contractor shall be responsible for compliance with NPDES and local erosion control permitting requirements for any and all on-site and off-site, disturbed spoil and borrow areas. Upon completion of spoil and/or borrow operations, clean up spoil and/or borrow areas in a neat and reasonable manner to the satisfaction of off-site property owner, if applicable, Owner and/or Owner’s Representative.

3.6 RIP-RAP

A. Place rip-rap in areas where indicated on Construction Drawings. Stone for rip-rap shall consist of field stone or rough unhewn quarry stone as nearly uniform in section as is practical. Stones shall be dense, resistant to action of air and water, and suitable for purpose intended.

B. Dress slopes and other areas to be protected to line and grade shown on Construction Drawings prior to placing of rip-rap. Undercut areas to receive rip-rap to elevation equal to final elevation less average diameter of stones before placing rip-rap.

C. Install filter fabric and bedding stone prior to placement of rip-rap if so indicated on Construction Drawings. Bedding stone shall be quarried and crushed angular limestone, 6-inches in depth in accordance with the details.

D. Place stones so that greater portion of weight is carried by earth and not by adjacent stones. Place stones in single layer with close joints. Upright areas of stone shall make angle of approximately 90 degree with embankment slope. Place courses from bottom of embankment upward, with larger stones being placed in lower courses. Fill open joints with spalls. Embed stones in embankment as necessary to present uniform top surface such that variation between tops of adjacent stones shall not exceed 3-inches.

3.7 FINISH GRADING

A. Grade areas where finish grade elevations or contours are indicated on Construction Drawings, other than paved areas and buildings, including excavated areas, filled and transition areas, and landscaped areas. Graded areas shall be uniform and smooth, free from rock, debris, or irregular surface changes. Finished subgrade surface shall not be more than 0.10-feet above or below established finished subgrade elevation. Ground surfaces shall vary uniformly between indicated elevations. Grade finished ditches to allow for proper drainage without ponding and in manner that will minimize erosion potential. For topsoil, sodding and seeding requirements refer to Section 02486.

B. Correct settled and eroded areas within 1 year after date of completion at no additional expense to Owner. Bring grades to proper elevation. Replant or
replace grass, shrubs, bushes, or other vegetation that appears dead, dying, or disturbed by construction activities.

3.8 FIELD QUALITY CONTROL

A. Field density tests for in-place materials may be performed at the expense of the OWNER as part of construction testing requirements in accordance with the following standard:

1. Nuclear Method: ASTM D 2922 (Method B-Direct Transmission)

B. Perform density test as follows:

1. Building Subgrade Areas, Including 10'-0" Outside of Exterior Building Lines: In cut areas, not less than 1 compaction test for every 5,000 sq. ft. In fill areas, same rate of testing for each 8-inch lift, measured loose.

2. Areas of Construction Exclusive of Building Subgrade Areas: In cut areas, not less than 1 compaction test for every 10,000 sq. ft. In fill areas, same rate of testing for each 8-inch lift, measured loose.

C. Corrective measures for non-complying compaction:

1. Remove and recompact deficient areas until proper compaction is obtained at no additional expense to Owner.

PART 4 – MEASUREMENT AND PAYMENT

4.1 Earthwork shall be paid as a Lump Sum item as indicated on the Project Bid Sheet.

END OF SECTION
SECTION 02310
EARTHWORK FOR UTILITIES

PART 1 - GENERAL

1.0 RELATED DOCUMENTS

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

1.1 SECTION INCLUDES

A. Excavate trenches for sanitary and storm piping and structures and all utility installation and for appurtenances as required.
B. Compacted bedding under pipe.
C. Backfilling and compaction of sanitary sewers and force mains, laterals, manholes, and related appurtenances.

1.2 RELATED SECTIONS

A. Section 02631 – Storm Sewer System
B. Section 02530 – Sanitary Sewer Line and Forcemain

1.3 REFERENCES

A. Pennsylvania Department of Transportation Publication 408/Latest Edition
B. Pennsylvania Code, Title 67, Chapter 459, Occupancy of Highways by Utilities/Latest Edition

1.4 SUBMITTALS

A. Submit in accordance with contract

1.5 TRENCHING REGULATIONS

A. In open trenching or boring on State, County or Township roadways, the Contractor shall be governed by the conditions, restrictions, and regulations made by the Pennsylvania Department of Transportation and municipal authority. All such regulations shall be considered part, as if included plus the ones set down in these Specifications.
B. The Contractor shall be responsible at all times for carrying out all excavation operations in a safe and prudent manner to protect all workmen and the public from unreasonable hazard. The necessary sheeting and bracing should be determined in accordance with the field conditions encountered. All applicable OSHA requirements must be strictly adhered to.
C. All sheeting and/or shoring devices used in depths over 8 feet shall be designed and certified by a Professional Engineer registered in the State of Pennsylvania. Such certification shall be provided to the Owner and/or Owner’s Representative prior to the use of such devices.

1.6 EXCAVATION
A. All trench excavation shall be unclassified.

1.7 BLASTING
A. No blasting shall be permitted.

1.8 TRAFFIC MAINTENANCE
A. The Contractor shall be required to submit to the Owner and/or Owner’s Representative for review and approval his maintenance and traffic control plan prior to beginning construction (if applicable). The plan shall be based upon the latest publication of the PennDOT Publication 203.

B. The Contractor shall furnish the necessary guards, watchmen, warning lights and similar items necessary to maintain state highway and other road/street traffic in accordance with PennDOT requirements. In general, the Contractor will not be permitted to interrupt traffic without specific arrangements for detouring traffic in accordance with PennDOT requirements. When traffic cannot be detoured, a minimum of 1/2 the roadway width shall be open at all times with traffic control.

1.9 WORK DURING INCLEMENT WEATHER
A. The Owner and/or Owner’s Representative reserves the right to order cessation of work during inclement weather, if, in the opinion of the Owner and/or Owner’s Representative, the safety of the workman is endangered or if the work itself is endangered.

1.10 ACCESS AND INSPECTION
A. All work in this section is subject to inspection by the Owner and/or Owner’s Representative and shall have full access to the project for same.

PART 2 - PRODUCTS

2.1 BACKFILL MATERIALS
A. #2A Coarse aggregated per PENNDOT PUB. 408, Section 703
B. AASHTO #10 or 1-B Crushed aggregated per PENNDOT PUB 408, Section 703.
C. AASHTO #57 Coarse aggregate
D. Suitable excavated material free of debris, organic material, and rock larger than four (4) inches.
E. Other as specified by utility company.
2.2 CONCRETE BACKFILL
   A. Concrete shall meet the requirements of Section 02515 – Site Concrete for Class B.

PART 3 - EXECUTION

3.1 EXAMINATION
   A. The Contractor's attention is directed to his responsibilities in accordance with PA Act 287. Any underground utilities shown on construction drawings should be verified prior to beginning construction.
   B. Maintain and protect existing utilities remaining which pass through work area.
   C. Before starting any earthwork activity under this Section, the Contractor shall insure that all Erosion and Sedimentation Controls are in place.
   D. Verify backfill materials to be used are acceptable.
   E. Verify that survey benchmarks and intended elevations for Work are as shown on the Drawings.

3.2 PREPARATION
   A. Identify required lines, levels, contours, and datum.
   B. Protect plant life, lawns, and other features remaining as a portion of final landscaping.
   C. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs from excavation equipment and vehicular traffic.
   D. In the event of damage, immediately make all repairs and replacements as required by the Owner and/or Owner’s Representative at no additional cost to the Owner.

3.3 EXCAVATION
   A. Where trenching occurs through bituminous or concrete pavement, the edge(s) shall first be cut through full depth to preclude distortion of remaining edge(s) during excavation.
   B. Excavate subsoil required for utility installation and appurtenances. Allow for bedding/support depth as indicated on the drawings. Use laser to maintain grade specified for sanitary sewers.
   C. Cut trenches sufficiently wide to enable installation of utilities and allow inspection.
   D. Excavation shall not interfere with normal forty-five (45) degree bearing splay of foundations.
   E. Correct unauthorized excavation at no cost to Owner.
   F. Unforeseen conditions encountered, such as sinkholes, shall be stabilized at a negotiated price.
   G. Correct areas over-excavated by error by backfilling with PENNDOT #2A STONE, satisfactorily compacted.
H. The Contractor shall dewater all trenches to provide a dry trench bottom for the installation of the sewer pipe. Trench water shall be discharged by pumps or by other means to natural drainage channels, storm drains, or other points upon written approval of the Owner and/or Owner’s Representative and in compliance with regulations of the SCS, and DEP. Where pumping is required, the Contractor shall provide sufficient pump capacity to maintain the trench bottom in a dry condition.

I. Remove excess material not being used to an approved on-site waste area or dispose of legally at Contractor's expense.

3.4 BEDDING

A. Bedding shall be placed in accordance with design drawings. Hand work material around pipe haunches and pipe to preclude misalignment and grade changes. Pipe that is damaged or moved out of alignment shall be re-laid by the Contractor at his expense.

3.5 BACKFILLING

A. Backfill trenches to contours and elevations with unfrozen materials of the SPECIFIED type.

B. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.

C. Employ a placement method that does not disturb or damage pipe in trench.

D. Place and compact backfill materials in continuous layers not exceeding 8 inches in compacted depth using standard compaction equipment. No Hydra-Hammers shall be used until two (2) feet over top of pipe is reached.

E. ALL roads and PENNDOT shoulders - #2A Coarse Aggregate

F. Refer to material specifications.

G. Maintain optimum moisture content of backfill materials to attain required compaction density.

H. Remove surplus backfill materials from site.

I. Replace and patch trenches with same depth asphalt as found existing at site of excavation.

3.6 CONCRETE BACKFILL

A. In locations where the excavations have been carried beneath existing structures, utilities, or pipes, such that the backfill cannot be compacted in accordance with the requirements of Paragraph 3.5, the Contractor shall furnish and place concrete backfill to support such existing structures, utilities or pipes. Concrete shall be Class B.

B. Where the volume of concrete backfill required exceeds two (2) cubic yards, boulder fragments of rock excavated during construction may be embedded in the concrete to provide added bulk. Concrete backfill shall be vibrated as necessary to assure the structural support of the existing structure, utility, or pipe.
3.7 TOLERANCES
   A. Top Surface of Backfilling: Under paved area, plus or minus one-half (1/2) inch from required elevation for aggregate base.
   B. Top Surface of General Backfilling: Plus or minus one (1) inch from required elevations.

3.8 FIELD QUALITY CONTROL
   A. Backfill shall be compacted until non-movement under compaction equipment is observed.
   B. The use of HYDRA-HAMMER for compacting backfill in trenches is prohibited until 2 feet over top of pipe is completed by other equipment.
   C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

3.9 PROTECTION OF FINISHED WORK
   A. Protect finished Work under provisions of general conditions.
   B. Re-compact fills subjected to vehicular traffic.

PART 4 - MEASUREMENT AND PAYMENT
4.1 Earthwork for utility installation shall not be paid as a separate line item and shall be included in the unit cost line items for utility installation as indicated on the Project Bid Sheet.
SECTION 02486

FINISH GRADING AND SEEDING

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Preparation of subgrade to receive seeding.
B. Provide additional finish grade material as required or needed.
C. Seed bed preparation; seeding, fertilizing and mulching (hydroseeding).
D. Lawn establishment and maintenance until acceptance.
E. Cutting, filling, and grading to required lines, dimensions, contours, and elevations for proposed improvements.
F. Scarifying, compacting, drying, dewatering and removal of unsuitable material to ensure proper preparation of areas for road sub-base.

1.2 NOT USED

1.3 DEFINITIONS

A. Finish Grade: Surface elevation or top of planting soil.
B. Subgrade: Surface or elevation of subsoil remaining immediately beneath planting soil or top of pavement subbase.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer whose work has resulted in successful lawn establishment.

1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.

B. Soil-Testing Laboratory Qualifications: An independent 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. Provide seed mixture in containers showing percentage of seed mix, producer's tests for purity and germination of seed, dated within nine months of sewing, net weight, date of packaging and locations of packaging.

D. Seed shall be blue tag certified, free of undesirable grass seed, and free of noxious weeds.
1.5 SUBMITTALS

A. Product Certificates: For soil amendments and fertilizers, signed by product manufacturer.

B. Qualification Data: For landscape installer.

C. 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. Certification of each seed mix for lawn identifying source, including name and telephone number of supplier.

D. Seed mixture and application quantities and procedures.

E. Fertilizer and mulch information showing analysis of mixture.

1.6 REGULATORY REQUIREMENTS

A. Comply with regulatory agencies for fertilizer.

B. Provide certificate of compliance from authority having jurisdiction indicating approval of seed mixture.
   1. Comply with Commonwealth of Pennsylvania Department of Transportation standard specifications.

C. All seed and seed labels shall be in accordance with State and Federal laws, rules and regulations including Article 9, Section 137 of the Agricultural and Markets Law.

1.7 PRODUCT DELIVERY, HANDLING AND STORAGE

A. Delivery:
   1. Do not deliver materials to job site until Project is ready for their immediate application.
   2. Seed and fertilizer which has become damaged in transit or outdated will not be accepted and MUST be removed from site immediately.

1.8 JOB CONDITIONS

A. Existing Conditions:
   1. Perform finish grading and seeding ONLY after preceding work affecting ground surface is completed.
B. Environmental Requirements:

1. DO NOT plant seed on frozen soil.
2. DO NOT perform seeding operations when wind exceeds 5 MPH.

C. Protection:

1. Restrict foot and vehicular traffic from seeded areas after seeding to end of maintenance period.

1.9 SCHEDULING

A. Planting Restrictions: Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

B. Seeding operations shall be performed in a timely fashion when the Contractor feels it is the appropriate time, because it is their responsibility to provide a healthy, weed free stand of grass.

C. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit. Do not perform seeding operations when wind velocity exceeds 5 mph.

PART 2 - PRODUCTS

2.1 SEED MIXTURE

A. Grass Seed: Fresh, clean, dry, new-crop seed.

B. Seed Species: State-certified seed of grass species, as follows:

i. Lawn Seed Mixture. (Penn DOT Formula B). Seed at a rate of 4 to 5 lbs. per 1000 sf.

<table>
<thead>
<tr>
<th>Grass</th>
<th>% By Weight</th>
<th>% Purity</th>
<th>% Germination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kentucky Bluegrass Mixture*</td>
<td>50</td>
<td>98</td>
<td>80</td>
</tr>
<tr>
<td>Perennial Ryegrass Mixture**</td>
<td>20</td>
<td>98</td>
<td>90</td>
</tr>
<tr>
<td>Creeping Red Fescue or</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spreading Fescue</td>
<td>30</td>
<td>98</td>
<td>85</td>
</tr>
</tbody>
</table>

*A combination of improved certified varieties with no one variety exceeding 25% of the bluegrass component.

**A combination of improved certified varieties with no one variety exceeding 50% of the total.
ii. Commercial lawn mix seed at a rate of 3 to 5 lbs. per 1000 sf.

<table>
<thead>
<tr>
<th>Commercial Lawn Mix</th>
<th>% By Weight</th>
<th>% Purity</th>
<th>% Germination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tall Type Tall Fescue</td>
<td>50</td>
<td>95</td>
<td>80</td>
</tr>
<tr>
<td>Creeping Red Fescue</td>
<td>25</td>
<td>98</td>
<td>85</td>
</tr>
<tr>
<td>Annual Ryegrass</td>
<td>25</td>
<td>98</td>
<td>95</td>
</tr>
</tbody>
</table>

### 2.2 FERTILIZER

**A. Bonemeal:** Commercial, raw or steamed, finely ground; percent of nitrogen and percent of phosphoric acid. Per soil test results.

**B. Superphosphate:** Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

**C. Commercial Fertilizer:** Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

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

1. Commercial Composition: 10 percent nitrogen, 20 percent phosphorous, and 20 percent potassium, by weight, and urea form 38 percent nitrogen.

2. Composition: Nitrogen, phosphorous, and potassium in amounts needed for the type of planting soil utilized

### 2.3 MULCHES

**A. Straw mulch:** Provide air-dry, clean, mildew-weed and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley free of foreign matter detrimental to plant life.

**B. Fiber Mulch:** Biodegradable, dyed wood, cellulose-fiber mulch; non-toxic; free of plant growth or germination inhibitors; with maximum moisture content of 14 percent +/- 3%, PH range of 4.5 to 6.5, ash content 1.4 percent +/- 0.2 percent, and a 1,000 percent minimum water holding capacity.

**C. Nonasphaltic Tackifier:** Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant growth or germination inhibitors. Use natural gum blended with jelling and hardening agents (Terra Tack AR) as manufactured by Grass Growers Company or approved equal.
D. Other mulch binders as approved by the local County Conservation District and PA Department of Environmental Protection (PADEP).

2.4 WATER

A. Free of substances harmful to plant growth, suitable for drinking.

2.5 TOPSOIL

A. Having a pH of between 6.0 and 7.0, containing not less than 2% nor more than 10% organic matter as determined by AASHTO T194.

B. Fertile friable loam, sand loam, or clay loam which will hold a ball when squeezed with the hand, but which will crumble shortly after being released.

C. Free of clods, grass, roots, or other debris harmful to plant growth.

D. Free of pests, pest larvae, matter toxic to plans, and weeds.

E. Topsoil removed during site preparation activities may be reincorporated into this work. Additional topsoil, as required, shall be furnished by the Contractor at no additional cost to the Owner.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine areas to receive finish grading and preparation for seeding to assure work of other trades has been completed.

B. Examine areas to receive finish paving and preparation for road installation to assure work of other trades has been completed.

C. Check that preceding work affecting subgrade surface has been completed.

D. Ensure that soil is not frozen and within allowable range of moisture content.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs and plantings from damages caused by seeding operations.

1. Protect adjacent and adjoining areas from hydroteasting 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 TOPSOIL PLACEMENT

A. In all lawn and planting areas, fracture the subsoil: Loosen subgrade to a minimum depth of twelve inches (12”). Remove all stones measuring over 3 inches (3”) in any dimension. Remove all sticks, roots, rubbish and other extraneous matter.

B. Spread topsoil to a minimum of 6 inches (3” at a time)) in depth so that the surface meets all lines, grades and elevations shown after light rolling and natural settlement.

C. Place approximately one half of total amount of topsoil required. Work into top of loosened subgrade to create a transition layer and then place remainder of topsoil.

D. Prepare one area at a time so that once an area has been loosened and topsoil incorporated, it is not compacted again by heavy equipment.

E. Fine grade lawn areas to smooth, even surface with loose, uniformly fine texture. Roll, rake and drag lawn areas, remove ridges and fill depressions as necessary to finish grades.

F. In planters: Place topsoil in lightly compacted layers to the depth required, allowing for natural settlement.

G. Coordinate all final grading and placement of topsoil with installation of plant materials.

3.4 HYDROSEEDING

A. Equipment shall have a built in agitation system and operating capacity sufficient to agitate, suspend and homogeneously mix a slurry containing not less than 44 pounds of organic mulching amendment plus fertilizer, chemical additives and solids for each 100 gallons of water.

B. Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with non-asphaltic tackifier (application rate of 70 lbs/acre).

2. Mix slurry with fertilizer (Best 6-20-20 or Best 15-15-15) or approved equal applied at rate appropriate for the product.

3. Apply slurry uniformly to all areas to be seeded in a two-step process. Apply first slurry application at a minimum rate of 500 pounds/acre dry weight but not less than the rate required to obtain specified seed-sowing rate. Apply slurry cover coat of fiber mulch at a rate of 1000 pounds/acre.

C. Water all areas to be hydroseeded thoroughly to saturate the soil prior to the hydroseeding operation.
D. Allow the planting area soil surface to dry out for one day only prior to the hydroseeding application. Exercise care not to allow the soil surface to be overly saturated with water prior to the hydroseeding installation. At the same time the soil surface should not become too dry during this period. There should be some residual moisture within the first ¼” of the soil surface.

E. Apply the hydroseeding in the form of a slurry consisting of organic soil amendments, commercial fertilizer, and any other chemicals that are called out or required. When hydraulically sprayed onto the soil, the mulch shall form a blotter-like material. Direct the spray operation so that this procedure will drill and mix the slurry components into the soil, the slurry spray will also penetrate the soil surface, thus ensuring maximum impregnation and coverage. The impregnation and mixing of the components will help in retaining moisture while stabilizing soil surface from superficial erosion.

F. Do not let the hydroseeding slurry components in the hydroseeding machine for more than two (2) hours because of possible seed destruction. If slurry components are left for more than two hours in the machine, add 50% more of the originally specified seed mix to any slurry mixture which has not been applied within the two hours after mixing. Add 75% more of the original seed mix to any slurry mixture which has not been applied eight (8) hours after mixing. All mixtures more than eight (8) hours old must be disposed, off-site, at the contractor’s expense.

G. Spray the area with a uniform visible coat, using the dark color of the cellulose fiber as a visual guide. The slurry shall be applied in a downward drilling motion via a fan stream nozzle. Insure that all of the slurry components enter and mix with the soil. Insure the uniformity of the hydroseed application.

F. Contractor shall save all seed and fertilizer tags and fiber mulch bags for the Owner or Owner’s Representative to verify compliance with the drawings and specifications.

3.5 PROTECTION

A. Immediately after seeding, erect barricades and warning signs to protect seeding areas from traffic until grass is established.

3.6 LAWN ESTABLISHMENT AND MAINTENANCE

A. Begin maintenance immediately after each area is planted and continue until acceptable vegetation is established.

B. Maintain and establish vegetation by watering, fertilizing, weeding, mowing, trimming, replanting and other landscaping operations. Roll, regrade, and replant bare or eroded areas and remulch as needed.

1. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch. Anchor as required to prevent displacement.
2. If any portion of the seeded surface becomes gullied or otherwise damaged following seeding, the affected areas shall be re-graded and reseeded as specified herein.

C. Watering: Provide water to vegetated areas to establish acceptable vegetative growth.

D. Reseed, fertilize and mulch areas larger than one square foot not having a uniform stand of grass.

E. Reworking and reseeding of any areas that fail to show a uniform stand of grass shall be done at the Contractor’s expense with the same mixture applied at the rate originally used and repeated until all areas are covered with a satisfactory stand of grass.

F. Establishment and maintenance period shall extend until a uniform lawn is established and "Final Acceptance".

3.7 INSPECTION REQUIREMENTS

A. The following list of minimal compliance standards are to be inspected and brought into compliance by the Contractor during construction. Discovery and correction of non-complying work is the responsibility of the Contractor. The Contractor shall identify and correct all non-complying items prior to requesting the processing of the Certificate of Substantial Completion.

B. Complying lawns and grasses work shall be capable of withstanding dead and live loads under normal use.

C. Non-complying work includes but is not limited to the following:

1. Dead grass

2. Sparse grass (can see soil beneath 3-inch high mown grass)

3. Erosion gullies with grass missing

4. Planting soil not rolled prior to seeding

3.8 CLEAN-UP

A. Remove all trash, debris and excess materials from project site.

B. Maintain all paved areas in a clean condition.

C. Remove all barriers and signs from site at the termination of the maintenance period.
3.9 INSPECTION AND ACCEPTANCE

A. The Owner or Owner’s Representative shall inspect the Finish Grading and Seeding work upon written request by the Contractor.

B. Upon acceptance of the Finish Grading and Seeding work, the Contractor shall be relieved of further responsibility for care and maintenance of the accepted area.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Excavation and backfill, classification, trench excavation including saw cutting of existing pavement, explosives and blasting, accommodation of traffic, accommodation of drainage, pumping, embankment, backfilling trenches, restoration, temporary paving and restoration of paved traveled areas, protection of property and structures, obstruction shown on drawings, removal of obstructions, and clean up.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 EXCAVATION AND BACKFILL – GENERAL

A. The Contractor shall excavate, protect and backfill all foundations, trenches, and other excavations that may be necessary for completing the work to be done under the Contract. All excavation shall be in open cuts, except where and to such extent as the Engineer may authorize or direct that same be done by boring or jacking, or where such is specified in the Special Requirements or Contract Plans. Trenches may be, in general, excavated and backfilled either by machinery, or by hand as the Contractor may elect; provided however, that the Engineer is empowered wherever he shall decide that such necessity exists, to direct that hand excavation be employed. The Contractor shall have no claim for extra compensation due to the fact that hand, instead of machine, excavation may be necessary from any cause whatever.

B. The Contractor shall perform all excavation of every description and of whatever substances encountered, to the lines and grades or depths indicated by the Drawings, as specified herein, or as directed by the Engineer. Embankments shall be prepared in accordance with the Specifications, and as necessary to bring the ground surface to finished grade elevations for areas as shown on the Drawings or directed by the Engineer. All excavated material not required for backfill or embankment shall be removed and wasted or otherwise disposed of as directed or specified.

3.2 CLASSIFICATION

A. All trench excavation as required by the Contract Drawings and Specifications,
shall be considered as unclassified excavation, with no additional payment being made in the event rock, quicksand, muck or other unsuitable material is encountered in the construction of such work.

3.3 TRENCH EXCAVATION

A. The Engineer shall have the right to limit the amount of trench opened in advance of backfilling. Generally a length of 100 feet of open trench will be permitted.

B. In case more material is excavated from any trench than can be backfilled over the completed pipe or can be stored on the street or within the limits of the right-of-way, leaving space for the traffic and drainage as herein provided, the excess material shall be removed to a site mutually agreeable to the Owner and Contractor. The Contractor is responsible for providing this site. The Contractor shall at his own cost and expense, bring back as much of the material removed as may be required to properly backfill the trench. If not of the proper kind or if so directed by the Engineer, the Contractor shall, at his own cost and expense, furnish such other suitable material as may be necessary.

C. All removal and protection of pavement will be done in accordance with Pennsylvania Code Title 67, Transportation dated July 1989. In case the Contractor removes or disturbs any pavement on account of settlement, slides, blasting, or cave-ins, the Contractor is required to replace all such pavement removed or disturbed without additional compensation. Pavement shall be saw cut prior to excavation, and the edges of the pavement shall be protected and maintained by the Contractor until the repaving is completed.

D. For excavation in paved areas, the backhoe out-rigger pads shall be equipped with rubber blocks to protect the pavement areas. When utilizing the loader bucket for stabilization, it shall also be blocked.

3.4 EXPLOSIVES AND BLASTING

A. The Engineer shall be empowered to regulate the character and strength of any explosives used, and the manner of their use and storage. Only small amounts of any explosives shall be kept at any place and they shall be kept under lock, the key to be only in the hands of a trustworthy person. Great care shall be taken in handling dynamite and similar explosives during freezing weather. Caps and exploders shall not be kept in the same place as explosives. Blasts shall be properly matted and securely covered.

B. The Contractor shall be solely responsible for injury to persons or property that may result from his use of explosives, and the exercise of, or failure to exercise control on the part of the Engineer shall in no way relieve him of responsibility for injury or damage resulting from their use.

C. If allowed, the blasting work shall be performed by a licensed and competent blasting contractor, having current acceptable insurance coverages in amounts satisfactory to the Engineer.
3.5 ACCOMMODATION OF TRAFFIC

A. Streets shall not be unnecessarily obstructed and unless the Engineer, in writing, shall authorize the complete closing of the street, the Contractor shall take such measures at his own expense, as may be necessary to keep the street or road open and safe for traffic.

B. The Contractor shall employ traffic control measures in accordance with Pennsylvania Department of Transportation Publication 213, Work Zone Traffic Control.

C. The Contractor shall construct and maintain, without extra compensation, such adequate and proper bridges over excavations as may be necessary or as directed for the safe accommodation of pedestrians or vehicles. The Contractor shall furnish and erect without cost to the Owner, substantial barricades at crossings of trenches, or along the trench, to protect the traveling public.

D. The Contractor shall not obstruct fire hydrants.

E. The roadway on one side of the line of work shall be kept open at all times.

F. The streets, crosswalks, and sidewalks shall be kept clean, clear and free for the passage of vehicles or pedestrians, unless otherwise authorized in writing by the Engineer. A straight and continuous passageway on sidewalks and over crosswalks, at least three feet in width, shall be preserved free from all obstructions.

G. Where deemed necessary, such additional passageway as may be directed shall be maintained free of obstructions.

H. In narrow or congested streets or alleys, when so directed, the Contractor shall complete his work up to a point designated by the Engineer before opening the work ahead, in order to give access to garages and other places. The Contractor shall in all cases so arrange his work as to cause the least inconvenience to property owners consistent with the proper prosecution of the work as determined by the Engineer.

3.6 ACCOMMODATION OF DRAINAGE

A. Gutters, sewers, drains and ditches shall be kept open at all times for surface drainage. No damming or ponding of water in gutters or other waterways will be permitted, except where stream crossings are necessary and then only to an extent which the Engineer shall consider necessary. The Contractor shall not direct any flow or water across or over pavements except through approved pipes or properly constructed troughs; and he shall, when so required and at his own cost and expense, provide pipes or troughs of such sizes and lengths as may be required and place the same as directed. The grading in the vicinity of pipe trenches shall be controlled so that the ground surface is properly pitched to
prevent water running into the trenches.

3.7 PUMPING

A. The Contractor shall keep all excavations free from water, at his own expense, while installation work is in progress, and to such extent as may be necessary while excavation work alone is being carried on. The Contractor shall build all dams and other devices necessary for this purpose, including lowering the water table below trench bottom by well points and pumping, and provide and operate pumps of sufficient capacity for dewatering the excavations. He shall provide for the disposal of the water removed from excavations in such manner as shall not cause injury to the public health, to public or private property, to the work of other contractors, to any portion of the work completed or in progress, or produce any impediment to the use of the highways, roads, lanes and streets by the public.

3.8 EMBANKMENT

A. Where embankment is necessary to support the foundations of or cover the pipe, it shall be made to the height, width and slopes shown on the Plans or as directed. The entire embankment or such portion thereof as may be deemed necessary by the Engineer, shall be made prior to the construction of the pipe or the foundation thereof at such time and in such order as the Engineer may direct.

B. The material for embankment shall be deposited in layers of not more than eight inches in thickness; each layer shall be separately compacted by heavy pavers' rammers. No breaks or irregularities in the distribution of the material or the formation of the layers will be allowed. The whole embankment shall be carried up evenly to the height given by the Engineer in such a manner as to make a compact and solid foundation. When pipe is to be laid in a fill, the embankment shall be brought to a height at least one foot above the proposed top of the pipe before the trench is excavated. The embankment shall then be excavated to the proper form and grade and the pipe placed thereon; after which the embankment shall be carried up to a height of not less than three feet above the top of the pipe, the material being placed and rolled or rammed in layers as above described.

C. In case the embankment over the pipe should obstruct any natural drainage, the Contractor will be required to do any work and furnish any material necessary to preserve natural drainage, to the satisfaction of the Engineer.

3.9 BACKFILLING TRENCHES

A. After the pipeline and its appurtenances have been constructed, all trenches shall be backfilled with the material indicated in the Trench Details included in the Construction Plans to a height six inches (6) above the top of the pipe and solidly rammed down and tamped around the pipe under it, with mechanical tampers and proper tools made for this purpose. The remainder of the trench shall be backfilled to the required height in layers not exceeding eight (8) inches in thickness. Mechanical tampers shall be used do as to obtain maximum compaction of the material.
B. Compaction of all trenches along and across State Road travelways and shoulders shall be in accordance with Pennsylvania Code Title 67, Transportation dated July 1989.

C. All backfilled surfaces shall be maintained flush with the adjacent undisturbed surfaces.

D. As the trenches are filled in and the work completed, the Contractor shall, at his own cost and expense, remove and dispose of all surplus earth, stone, slag, or other material from the work, in such manner and at such point or points as he may select or provide, subject to the approval of the Engineer; or he may deposit the same, either with or without rehandling, at any point or points on the lines of the work covered by the Contract, if so directed by the Engineer; and shall leave all roads, sidewalks and other places free, clear and in good order. In case the Contractor shall fail or neglect to do so, or to make satisfactory progress in doing so, within 24 hours after the receipt of a written notice from the Engineer, the Owner may remove such surplus material and clear the roadways, sidewalks and other places, and the cost of said work shall be charged to the Contractor and deducted from any moneys due or to become due him under the Contract.

3.10 RESTORATION

A. Upon completion of all compacted backfilling of non-topsoil excavation, the top soil previously removed and stored shall be replaced and mounded over the backfilled area. Immediately upon backfilling of the trench for the entire length over each individual property, the entire disturbed area of this property shall be cleaned of all debris, graded and fine-raked. Thereafter, all shrubbery, hedges, trees, fences, walkways, etc., shall be replaced to a condition of equal to that before construction. Reseeding of the backfilled area within the reasonable limits of the construction is required. However, the careful replacement of the soil, the prompt cleanup and raking of the construction area on each property, the complete replacement of all removed surface items and the continued maintenance of the top surface of the trench shall be strictly enforced. In the event that the trench surface compacts in some places lower than the original grade, these areas shall be refilled with top soil, whether or not available on the property upon which the depression occurs. The Contractor shall be required to periodically inspect all mounded areas of backfill and repair and maintain these areas as necessary until no further compaction results. Reseeding and mulching must be done within twenty (20) days of backfilling, weather permitting. Hydro-seeding methods are acceptable.

3.11 TEMPORARY PAVING AND RESTORATION OF PAVED TRAVELED AREAS

A. In all paved areas other than State Highways and in all unpaved areas used as thoroughfares, road shoulders, driveways or parking areas, the Contractor shall provide over all backfilled excavations a temporary paving consisting of a layer of crushed stone. Contractor shall maintain these temporary crossings, without additional compensation, until permanent pavement is placed. No additional compensation will be allowed for this layer of crushed stone or for any excavation
required to place permanent pavement.

B. The Contractor, at his option, may elect to provide the permanent replacement of any bituminous paving immediately after backfilling is completed. In such cases, the requirements for temporary crushed stone are waived.

C. Temporary restoration of a pavement or paved shoulder may be required by the Engineer prior to permanent restoration, under the following:

(1) The base shall consist of compacted select granular material with a surface of 2-inch bituminous material. If the existing pavement structure includes a course of subbase material, it shall be replaced to a depth equal to the existing course depth with material meeting the requirements of Section 350.2 of Publication 408.

(2) Temporary pavement restoration shall be completed before traffic is allowed to travel on the disturbed area. The temporary pavement may be kept in place for up to 6 months or as specified in the Pennsylvania Department of Transportation Highway Occupancy Permit (if applicable), if it is properly maintained.

(3) The temporary pavement shall be removed and permanent restoration performed.

Paint Identification. Upon completion of pavement or paved shoulder restoration, the restoration date shall be painted immediately adjacent to the restored cut but not in an area where tires normally contact the pavement. The painted date shall indicate the month and year numerically. The numerals shall be 6 to 9 inches in height. The paint shall be color coded as follows: blue (water), yellow (gas-petroleum), red (electric), orange (communications), and green (sewer). The paint shall be maintained for 2 years after the acknowledged completion of the permitted work. If the pavement or shoulder is being overlayed for more than 100 linear feet, the PennDOT District Office may, upon request, exempt the permittee from complying with this subsection.

Appurtenances to Underground Installations. Requirements relating to appurtenances to underground installations shall include:

(1) The top of every manhole, valve box or other access to the facility shall be at the same elevation as the surface in which it is located.

(2) The surface surrounding manhole covers located in paved shoulders shall be paved with 4 inches bituminous concrete base course a distance of at least 1 foot around the structure to prevent washouts.
(3) A manhole, including those cast-in-place, shall be constructed in compliance with current industry standards and Section 713.2(c) of PennDOT Publication 408.

D. The Contractor shall be responsible for any injury or damage resulting from lack of required trench maintenance during the prescribed maintenance period.

3.12 RESPONSIBILITY FOR CONDITION OF EXCAVATION

A. The Contractor shall be responsible for the condition of all excavations made by him. All slides and cave-ins shall be removed without extra compensation, at whatever circumstances they may occur.

B. The neglect, failure, or refusal of the Engineer to order the use of bracing or sheeting, or a better quality, grade or section, or larger sizes of steel or timber, or to order sheeting, bracing, struts, or shoring to be left in place or the giving or failing to give orders or directions as to the manner or method of placing or driving sheeting, bracing, jacks, wales, rangers, etc., shall not in any way or to any extent relieve the Contractor of any responsibility concerning the condition of excavation or of any of his obligations under the contract; nor shall any delay, whether caused by any action or want of action on the part of the Contractor, or by any act of the Owner, or his agents, or employees, resulting in the keeping of an excavation open longer than would otherwise have been necessary, relieve the Contractor from the necessity of properly and adequately protecting the excavation from caving or slipping, nor from any of his obligations under the Contract relating to injury of persons or property, nor entitle him to any claim for extra compensation.

3.13 PROTECTION OF PROPERTY AND STRUCTURES

A. The Contractor shall, at his own expense, sustain in their places, and protect from direct or in-direct injury, all pipes, tracks, walls, buildings, and other structures or property in the vicinity of his work, whether above or below the ground, or that may appear in the trench. He shall at all times have a sufficient quantity of timber and plank, chains, ropes, etc., on the ground and shall use them as necessary for sheeting his excavations and for sustaining or supporting any structures that are uncovered, undermined, endangered, threatened, or weakened.

B. The Contractor shall take all risks attending the presence or proximity of pipes, poles, tracks, walls, building and other structures and property, of every kind and description, in or over his trenches, or in the vicinity of his work, whether above or below the surface of the ground; and he shall be responsible for all damages and assume all expense for direct or indirect injury, caused by his work to any of them, or to any person or property by reason of injury to them, whether such structures are or are not shown on the Drawings.

C. The Engineer reserves the right under such conditions to stop the excavation or any other part of the work, and to require the Contractor to complete the pipeline and the backfilling up to such a point as the Engineer may direct before
proceeding further with the excavation, and the Contractor shall not thereby become entitled to demand or to receive any allowance or compensation, other than an extension of the Contract Time for as many days the Engineer may determine that the work was delayed by such stoppage.

3.14 OBSTRUCTIONS SHOWN ON DRAWINGS

A. Certain information regarding the reputed presence, size, character, and location of existing underground structures has been shown on the Contract Drawings. There is no certainty of the accuracy of this information, and it shall be considered by the Contractor in this light. The location of underground structures shown may be inaccurate and other obstructions than those shown may be encountered. The Contractor hereby distinctly agrees that the Owner is not responsible for the correctness or sufficiency of the information given, or on account of the insufficiency or absence of information regarding obstructions either revealed or not revealed by the Drawings; and that he shall have no claim for relief from any obligation or responsibility under the Contract, in case the location, size, or character or any pipe or other underground structure is not indicated on the Drawings, or in case any pipe or other underground structure is encountered that is not shown on the Drawings.

3.15 REMOVAL OF OBSTRUCTIONS

A. Should the position of any pipe, conduit, pole, or other structures, above or below the ground be such as, in the opinion of the Engineer, to require its removal or realignment, changes will be done as extra work, or will be done by the Owner of the obstructions, without cost to the Contractor. But the Contractor shall uncover and sustain the structures at his own expense before such removal and before and after such change as constituting part of the Contract; and the Contractor shall not be entitled to any claim for damage or extra compensation on account of the presence of said structure, or on account of any delay in the removal or rearrangement of the same.

B. The Contractor shall not interfere with any persons, firms, or corporations, or with the Owner in protecting, removing, changing, or replacing their pipes, conduits, poles, or other structures; but he shall suffer said persons, firms, corporations, or the Owner, to take all such measures as they may deem necessary or advisable for the purpose aforesaid, and the Contractor shall thereby be in no way relieved of any of his responsibilities under the Contract.

C. At railway or railroad track crossings, any expense to which the owner of the trackage is put, in shoring up tracks, or in maintaining traffic shall be borne by the Contractor whether the same is billed directly to him, or the Owner. Should any such bill be unpaid by the Contractor, before final payment under the Contract is made, the Owner shall be empowered to pay said bill and retain the amount thereof, from any moneys due, or to become due the Contractor.

D. Except for trees in the direct line of construction which have not been specifically designated to be left standing, the Contractor shall not cut down or destroy any
other trees unless specifically authorized to do so by the Engineer; and the Contractor shall have no claim for extra compensation owing to the fact that he may be required to excavate by hand or tunnel in the vicinity of trees required to be left standing, or remove, preserve and restore a tree, or replace a damaged or destroyed tree.

3.16 SITE WORK AND CLEANUP

A. It shall be the responsibility of the Contractor to keep the site neat and clean as the work progresses. Prior to final acceptance, the structure, machinery, and appurtenant materials, as well as the site on which the pipeline is located, shall be thoroughly cleaned and made pleasing in appearance. Should the Contractor fail to keep clean-up current, the Engineer is authorized to shut down all parts of the job until clean-up is current.

END OF SECTION
SECTION 02580

BITUMINOUS PAVING

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, material and equipment to restore all areas disturbed or damaged by the construction work and install on-site bituminous asphalt pavement. These areas shall include, but are not limited to:

1) Concrete Paved Areas
2) Bituminous Paved Areas
3) Shoulders
4) Sidewalks
5) Gravel Driveways
6) Curb/Curb Gutter

1.2 RELATED SECTIONS

A. Section 02515 - Site Concrete

1.3 REFERENCES

A. Pennsylvania Department of Transportation Publication 408/Latest Edition

B. Pennsylvania Code, Title 67, Chapter 459, Occupancy of Highways by Utilities/Latest Edition

C. Pennsylvania Department of Transportation Publication 72, Standards for Roadway Construction, Series RC-0 to 100, Latest Edition

1.4 SUBMITTALS

A. Submit Mix Designs and sources of supply of all materials used under this Section. Submit in accordance with Contract.

1.5 JOB CONDITIONS

A. Materials and Installation: These items involving bituminous and concrete paving shall be the same for PennDOT, Township, Borough, and private areas.
B. **Qualifications of Workmen:** Provide at least one person who shall be thoroughly trained and experienced in the skills required, who shall be completely familiar with the design and application of work described for this Section, and who shall be present at all times during progress of the work of this Section and shall direct all work performed under this Section.

1) For actual finishing of asphalt and concrete surfaces and operations of the required equipment, use only personnel who are thoroughly trained and experienced in the skills required.

C. **Dust Control:** Use all means necessary to control dust on and near the Work and on and near all off-site borrow areas if such dust is caused by the Contractor's operations during performance of the Work or is a result of the condition in which the Contractor leaves the site. Thoroughly moisten all surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other Work on the site.

D. **Protection:** Use all means necessary to protect the materials of this Section before, during, and after installation and to protect the Work and materials of all trades.

E. **Replacements:** In the event of damage, immediately make all repairs and replacements necessary to the approval of the Construction Manager and at no additional cost to the Owner.

F. **Protection of Utilities:** Protect existing facilities.

G. **Testing:** The Contractor is advised that the Owner reserves the right to retain the services of a testing Laboratory to check the densities of subgrade and bituminous material. In addition, cores may be taken to verify the thickness of the paving material. All testing costs will be charged to the Contractor.

1.6 **TRAFFIC MAINTENANCE**

A. The Contractor shall furnish the necessary guards, watchmen, warning lights and similar items necessary to maintain state highway and other road/street traffic in accordance with PennDOT requirements. In general, the Contractor will not be permitted to interrupt traffic without specific arrangements for detouring traffic in accordance with PennDOT requirements. When traffic cannot be detoured, a minimum of 1/2 the roadway width shall be open at all times with traffic control.

**PART 2 – PRODUCTS**

2.1 **AGGREGATE BASE COURSE FOR PAVED AREAS**

A. Provide aggregate base complying with the applicable PennDOT Specifications, Publication 408, Section 350 - Subbase.
2.2 ASPHALTIC MATERIALS

A. Mix Design: Provide asphaltic concrete consisting of a mixture of sand, mineral aggregate, and liquid asphalt mixed in such proportions that they meet applicable State Department of Transportation Publication 408 Specifications Superpave Asphalt Mixture Design.

2.3 CEMENT CONCRETE FOR RESTORATION

A. Cement concrete shall meet the specifications of Section 03300, Cast-In-Place Concrete.

1) Paving - Class AA or Class H.E.S.
2) Plain Cement Concrete Curb Gutter - Class AA
3) Plain Cement Concrete Curb - Class A
4) Cement Concrete Sidewalk - Class A

2.4 GRAVEL DRIVEWAYS AND SHOULDERS

A. Gravel Driveways - Granular material meeting the specifications of Publication 408, Section 703.

B. Stabilized Shoulders - Paragraph 2.04A.

C. Paved Shoulders, Type III

1) Aggregate Base - PennDOT #2A
2) Bituminous Prime Coat - MC-30, MC-70
3) Bituminous Surface Treatment
   a) E2 Emulsified Asphalt
   b) AASHTO No. 8 and No. 67 Coarse Aggregates

2.5 OTHER MATERIALS

A. All other materials, not specifically described but required for proper and complete installation of the Work of this Section, shall be selected by the Contractor subject to the approval of the Construction Manager.

PART 3 – EXECUTION

3.1 GENERAL

A. Inspect all areas requiring work under this Section to ensure readiness to receive restoration.
B. Permanent bituminous paving can only be done between April 1 and October 31 unless otherwise permitted in writing by the Construction Manager and/or PADOT (within PADOT right-of-way).

3.2 RAISING MANHOLE COVERS AND VALVE BOXES

A) Install the adjusting rings in all sewer and storm manholes that require adjusting to meet the elevation of the repaving.

1) Manholes within actual new construction shall meet finished elevation without adjusting rings.

B. Coordinate the raising of all valve boxes and/or manhole covers belonging to other utilities.

C. Where adjustments require the resetting of manhole covers, the mortar shall consist of Portland cement and silica sand. After material has set, paint with approved bitumastic coating.

D. Contractor shall be responsible to see that all such items as mentioned above are adjusted to the new paving elevation.

3.3 CONCRETE PAVING/PATCHING

A. Perform all work for this activity as specified in PennDOT Publication 408, Section 501 - Reinforced or Plain Cement Concrete Pavement and RC Standards No. 21 and No. 26.

3.4 SUBGRADE AND AGGREGATE BASE PREPARATION – PENNDOT / TOWNSHIP / BOROUGH / PRIVATE

A. In preparation for permanent repaving, the temporary paving shall be removed.

B. Prior to the replacement of the aggregate base course, the edges of the existing bituminous base and surface must be sawed a minimum of one (1) foot back from each side of the actual trench width.

C. Remove all material within the trench and "cut back" area to subgrade ready for the base course.

D. The subgrade for all repaved areas shall be thoroughly compacted to the proper distance below and parallel with the prescribed level of the base course. The subgrade shall be completely compacted in an approved manner prior to placing the aggregate base course. The subbase depth shall be as shown on the Drawings and State or Municipality Standards.

3.5 BITUMINOUS PAVING - PENNDOT/TOWNSHIP/BOROUGH/PRIVATE

A. Place bituminous materials in accordance with PennDOT Publication 408, Specifications:
1) Bituminous Concrete Base Course - Section 305
2) Bituminous Binder Course - Section 421
3) Bituminous Wearing Course - Section 420

3.6 EQUIPMENT

A. Compacting Equipment: Shall be self-propelled tandem rollers having a minimum weight of ten (10) tons, except that hand-held vibrator compactors may be used in areas not accessible to rollers when specifically approved by the Construction Manager.

B. Paving Equipment: Shall be spreading, self-propelled asphalt paving machines capable of maintaining line, grade, and the minimum surface thickness specified, except that spreader boxes may be used in areas where specifically approved by the Construction Manager.

3.7 PLACEMENT OF ASPHALTIC CONCRETE (SPECIFICS)

A. Placement: After completion of the aggregate base course, place base and wearing courses of types and thickness as shown on the Drawings.

B. Tack coat all vertical joints between existing and new paving with E-1, E-6, or E-8 bituminous material.

C. Receipt of Materials: Do not accept material unless it is covered with tarpaulins until unloaded, when the temperature is more than 15_F below the minimum temperature shown on the bituminous material suppliers Bill of Lading and when exceeding the maximum specified temperature.

D. Do not place asphaltic concrete until the atmosphere and surface temperatures are 35 F (and rising) for base course and 40 F (and rising) for wearing; nor during fog, rain, or other unsuitable conditions.

E. Spreading: Spread material in a manner which requires the least handling. Where thickness of finished pavement will be three (3) inches or less, spread in one (1) layer.

F. Rolling: After the material has been spread, roll with the specified equipment until the surface is hard, smooth, unyielding, and true to the thickness and elevations shown on the Drawings.

G. Roll the surface in at least two (2) directions until no roller marks are visible.

H. Finished surfaces shall be smooth, free from birdbaths, and shall be free of irregularities.
3.8 OVERLAY

A. Where a surface course is required over existing roads, the surfaces to be covered shall be cleaned of all foreign substances and any irregularities removed or filled in. A tack coat shall be applied in accordance with Section 460, of the PennDOT Publication 408, after which the surface course will be applied.

B. Where the overlay meets the existing paving a neat cut shall be made in the existing surface in accordance with the construction details as shown on Standard RC-28 or as directed by the Construction Manager.

C. Contractor shall be responsible to see that all such items as mentioned in Section 3.08 A and B are adjusted to the new manhole elevation in such a manner as to provide a smooth, even transition from pavement to manhole cover.

3.9 FINISH TOLERANCES

A. Finish all surfaces to the following tolerances:

1) **Base Course**: Plus or minus 0.04’ from line and grade shown on the Drawings.

2) **Wearing Course**: Plus or minus 0.02’ at any point from line and grade shown on the Drawings.

B. Core Testing (when required).

3.10 SEALING

A. All joints between the new paving and the existing paving and where the new paving abuts other materials such as curbs, manhole frames, and inlets shall be sealed with PennDOT asphalt cement AC-20. Width shall be twelve (12) inches for pavement joints and where curb acts as a gutter. Others shall be six (6) inches.

3.11 MAINTENANCE

A. The Contractor shall maintain the final pavement for a period of two (2) years following the date of acceptance of project. In general, depressions in the final pavement in excess of one half inch below the normal road grade shall be corrected. Corrections in the pavement shall be made within fifteen (15) days after the Contractor has been notified of the need for corrective action. In the event of the failure or refusal of the Contractor to make such corrections, the Owner reserves the right to have the necessary work performed and to charge the cost to the Contractor under the Maintenance Bond.
3.12 BITUMINOUS DRIVEWAYS AND SIDEWALKS

A. The materials and construction practices shall be as specified in Sub-Sections - Parts 2 and 3.

B. Aggregate base shall be as specified on the drawings.

C. Bituminous may shall be minimum two (2) inch depth for both or "in-kind" where existing is greater.

D. Lighter, smaller compaction equipment may be used in these operations.

3.13 BITUMINOUS CURB

A. The material and construction of bituminous curb replacement shall be in accordance with PennDOT Publication 408 - Section 636.

3.14 CEMENT CONCRETE CURB/CURB GUTTER/SIDEWALKS

A. General

1) Remove minimal lengths for restoration, normally, to a scoring or joint.

B. Grade areas to allow respective depths of aggregate base in kind with minimum being four (4) inches.

C. Place one-half (1/2) inch expansion material between new and old concrete and other existing rigid structures.

D. Place required class of concrete to the same cross-section as existing. Refer to PennDOT Standard RC-64 for sizing where original cross-section is indefinite.

1) Driveways shall be minimum six (6) inches thick.

2) Sidewalks shall be minimum four (4) inches thick.

E. Surfaces shall be given a light broom finish with all edges tooled.

F. Curing may be with wet burlap or liquid membrane.

G. Contraction joints may be tooled or saw-cut. Twenty (20) feet maximum for curb/curb gutter and five (5) feet for sidewalk.

H. Mold four (4) test cylinders for each days placement. When day's placement is over fifty (50) cubic yards, mold four (4) test cylinders for each fifty (50) cubic yards or part thereof.
3.15 GRAVEL DRIVEWAYS AND STABILIZED SHOULDERS

A. Place six (6) inches of granular material meeting the requirements of Sub-Section 2.04A.

B. Grade shoulders to a minimum of one-half (1/2) inch per foot, or existing slope and properly compact.

1) If the length of the facility exceeds fifty (50) feet, the shoulder shall be graded, rolled, and penetrated with RT-2C or MC-30 bituminous material at a minimum rate of .25 gallon per square yard and chipped or lightly sanded to prevent tracking of oil onto the pavement.

3.16 PAVED SHOULDERS, TYPE 3

A. This work is construction of shoulders on a prepared surface and consists of the following:

1) Place PennDOT No. 2A material to the depths of bituminous base and wearing courses allowing one-half (1/2) inch for depth of surface treatment after compaction.

2) Apply prime coat of MC-30 on MC-70 bituminous material at the rate of .20 to .50 gallon per square yard and allow to cure twenty-four (24) hours. Protect surface during this period.

3) Apply E-2 bituminous material at the rate of .25 to .50 gallon per square yard. Then spread 25 to 45 pounds of AASHTO No. 67 course aggregate and roll thoroughly to set aggregate.

4) After first application has cured, apply E-2 at a rate of .25 to .50 gallons per square yard. Then spread 15 to 30 pounds of AASHTO No. 8 coarse aggregate and roll thoroughly to set aggregate.

5) Use pneumatic-tire and steel wheel tandem rollers (non-vibratory) for rolling. Do minimal backrolling.

6) Protect from traffic until areas have cured.

B. For this Work in PennDOT Rights-of-Way, adhere to PennDOT Publication 408, Section 653 and Highway Occupancy Permit.

END OF SECTION 02580
SECTION 02590

MAINTENANCE AND PROTECTION OF TRAFFIC

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. This work is the maintenance and protection of traffic adjacent to and within the construction/work area.

1.2 RELATED SECTIONS

A. Not Used.

1.3 REFERENCES

A. Pennsylvania Department of Transportation (PADOT):
   1. Publication 408 – Specifications
   2. Publication 35 – Approved Construction Materials (Bulletin 15)
   4. Publication 213 – Work Zoned Traffic Control

1.4 SUBMITTALS

A. Not Used.

1.5 NOTIFICATION

A. Notify the residences, private companies and the Impacted Areas at least 10 days before the placement of traffic control devices. Inform the Owners of proposed work and schedule. Temporary Message Boards will be provided a minimum of 15 days prior to installation of other traffic control devices.

PART 2 – PRODUCTS

2.1 MATERIALS

A. As specified in Section 901.2 of PADOT Publication 408.

PART 3 – EXECUTION

3.1 GENERAL

A. Comply with PADOT Publication 213.
B. Install and maintain traffic control devices. Use nonmetallic drums only. Reflectorize drums as indicated in PADOT Publication 213, except use minimum 6-inch to maximum 8-inch wide circumferential stripes, or use white drums to support vertical panels as indicated in PADOT Publication 213. Provide safety for the general public and the work crew, and protection of the work.

C. Schedule construction/work operations to permit movement of traffic as indicated for various phases of construction with minimum interference. If traffic interruptions become too frequent, cease operations in the area concerned, as directed. Take satisfactory remedial action to correct the situation before continuing operations.

D. Open any substantially completed section of roadway for the use and convenience of traffic, as directed, and as specified in Section 107.15, PADOT Publication 408. When work is completed, immediately remove work zone traffic control devices.

3.2 MAINTENANCE OF ROADWAY AND/OR STRUCTURES

A. Treat existing earth roads or improved roads that have been graded with calcium chloride or by other approved dust control measures as specified or directed.

3.3 DETOURS

A. For indicated detours, furnish, erect, maintain, and remove the detour signs, unless otherwise specified. Also, temporarily cover, revise, or remove existing permanent guide signs, in the vicinity of the construction site and along the detour route, if the messages on the guide signs conflict with the detour signs. Erect, maintain, and remove the detour signs and the modification of directional signs, as indicated, and as required for construction conditions. Restore original signs to their original state upon removal of the detour.

3.4 LOCAL TRAFFIC MAINTENANCE AND SAFETY

A. Proceed with the work to ensure safety and the least inconvenience to local traffic. Maintain local traffic ingress and egress by use of existing or new roadways.

B. Provide and maintain local access to and from the nearest intersection of public roads or street, unless otherwise directed. Provide temporary approaches for local vehicular and pedestrian access to and from commuter service, residential, business, industrial and other public and private facilities.

C. Provide and maintain adequate bridging over base and surface courses, trenches, or other construction.

3.5 EQUIPMENT AND MATERIAL STORAGE

A. Comply with PADOT Publication 213.
3.6 TUBULAR MARKERS

A. When specified or indicated, furnish and install tubular markers in accordance with, PADOT Publication 213.

B. When directed or as required, replace the complete tubular marker or the tubular marker post only, as the case may be.

C. When directed or as required, replace the reflective band on the tubular marker.

D. Remove tubular markers when no longer required for traffic control or as directed.

3.7 EXISTING SIGNS

A. Remove existing warning, regulatory, guide and directional signs as required to accommodate construction operations. Do not remove Stop or Yield signs unless an alternate type of traffic control is provided, such as flaggers, temporary traffic signal, etc. Continue the alternate traffic control until the Stop and/or Yield signs are replaced. Stake or mark sign locations or locate signs on construction drawings before removing any signs. Reinstall existing warning signs at appropriate locations within 4 hours of their removal. With the exception of Stop or Yield signs as herein noted, reinstall existing regulatory, guide and directional signs at appropriate locations within 24 hours of their removal.

3.8 BARRICADES

A. Furnish and install barricades in accordance with PADOT Publication 213; except, all barricades to have a minimum of 270 square inches of reflective area facing traffic.

3.9 DROPOFFS

A. General. The following conditions and treatments apply only to dropoffs created by construction, maintenance, or permit/utility operations:

1. Drainage ditches are not to be considered as dropoffs.

2. When channelizing devices are used for a dropoff condition, a minimum of 2 devices are required.

3. If a dropoff is greater than 6 inches and the distance from the dropoff to the edge of the travel lane is such that channelizing devices must be placed below grade, position the devices on a stable platform so that the bottoms are at grade.

4. Temporary concrete median barrier may be required at the discretion of the Owner.
B. Dropoffs Between Travel Lanes. If a dropoff less than or equal to 2 inches exists between travel lanes, channelizing devices are not required. If a dropoff greater than 2 inches exists between travel lanes, provide the following as required:

1. On two-way, two-lane roadways, install “Do Not Pass” signs (R4-1) in each direction, at intervals not exceeding ½-mile, throughout the dropoff condition and install two-direction no passing zone, standard pavement markings in accordance with Figure 3, PADOT Publication 203.

C. Dropoffs Between the Edge of the Travel Lane and the Shoulder. If a dropoff less than or equal to 2 inches exists between the edge of the travel lane and the shoulder, channelizing devices are not required. If a dropoff greater than 2 inches exists, install channelizing devices throughout the dropoff condition. Install “Low Shoulder” signs (W8-11), at intervals not exceeding ½-mile, throughout the dropoff condition to supplement the channelizing devices.

D. Dropoffs In or Beyond the Shoulder. If a dropoff less than or equal to 2 inches exists in or beyond the shoulder area, channelizing devices are not required. If a dropoff greater than 2 inches exists in or beyond the shoulder area, install channelizing devices throughout the dropoff condition, unless the dropoff is:

1. Outside the right-of-way, or
2. Behind guide rail, or
3. Behind curb, or
4. 15 feet or more from the edge of roadway.

E. Spacing of Channelizing Devices for Dropoffs. Space channelizing devices at 2 times the normal speed limit in feet or closer, as directed.

END OF SECTION
SECTION 02602

SUBGRADE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Subgrade

1.02 QUALITY ASSURANCE

A. An Independent Testing Laboratory (ITL), secured by the Contractor for the Owner, will be retained to perform construction testing on site.

1. The independent testing laboratory shall prepare test reports that indicate test location and test results. Owner, Engineer, and Contractor shall be provided with copies of reports within 96 hours of time that test was performed. In event that test performed fails to meet Specifications, the independent testing laboratory shall notify Owner, Engineer, and Contractor immediately.

2. Costs related to retesting due to failures shall be paid for by the Contractor at no additional expense to Owner. Contractor shall provide free access to site for testing activities.

3. Quality assurance testing will be conducted in accordance with “Field Testing” in Part 3 hereinafter.

PART 2 - PRODUCTS

Not Included.

PART 3 - EXECUTION

3.01 SUBGRADE

A. Subgrade shall be constructed in accordance with PennDOT Publication 408, Section 210 "Subgrade."

3.02 FIELD TESTING

A. Nuclear Compaction field tests for in-place materials will be performed by the Owner’s Independent Testing Laboratory (ITL) in accordance with the requirements specified in PennDOT Form 408, latest edition and as required by the Engineer.

END OF SECTION
SECTION 02604

SUBBASE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Subbase

1.2 QUALITY ASSURANCE

A. An Independent Testing Laboratory (ITL), secured by the Contractor for the Owner, will be retained to perform construction testing on site.

1. The independent testing laboratory shall prepare test reports that indicate test location and test results. Owner, Engineer, and Contractor shall be provided with copies of reports within 96 hours of time that test was performed. In event that test performed fails to meet Specifications, the independent testing laboratory shall notify Owner, Engineer, and Contractor immediately.

2. Costs related to retesting due to failures shall be paid for by the Contractor at no additional expense to Owner. Contractor shall provide free access to site for testing activities.

3. Quality assurance testing will be conducted in accordance with “Field Testing” in Part 3 hereinafter.

PART 2 - PRODUCTS

2.1 SUBBASE

A. Subbase shall conform to the latest edition of the Pennsylvania Department of Transportation Publication 408 Specifications (PennDOT Publication 408), Section 350 "Subbase."

PART 3 - EXECUTION

3.1 SUBBASE

A. Subbase shall be constructed in accordance with PennDOT Publication 408, Section 350 "Subbase."

3.2 FIELD TESTING

A. Nuclear Compaction field tests for in-place materials will be performed by the Owner’s Independent Testing Laboratory (ITL) in accordance with the requirements specified in PennDOT Form 408, latest edition and as required by the Engineer.

END OF SECTION
SECTION 02620

CONCRETE CURB, GUTTER, SIDEWALK, AND DRIVEWAY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete Curb

B. Concrete Mountable Curb

C. Concrete Gutter

D. Concrete Curb Gutter

E. Standard Concrete Sidewalk

F. Structural Concrete Sidewalk

G. Curb Cut Ramp

H. Standard Integral Concrete Curb and Sidewalk

I. Structural Integral Concrete Curb and Sidewalk

J. Unsuitable Material Overexcavation and Backfill with PennDOT No. 2A Stone

K. Concrete Driveway

1.02 RELATED SECTION(S)

A. Commonwealth of Pennsylvania, Department of Transportation, Publication 408 Specifications, current edition with all supplements (PennDOT Publication 408).
1.03 REFERENCE(S)


B. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

C. ASTM A615 - Deformed and Plain Billet Steel for Concrete Reinforcement.

D. ASTM A36 - Structural Steel

1.04 APPLICABLE STANDARD DRAWINGS

A. PennDOT Roadway Construction Standards RC-64 "Curb and Gutters", RC-65 "Concrete Mountable Curbs", and RC-67 "Curb Cut Ramps" included in the attachments to this Section.

1.05 SUBMITTALS

A. Certificates

Submit certification from material suppliers attesting that the following materials (where applicable) meet or exceed specification requirements:

1. Concrete
2. Concrete Curing Compound
3. Welded Wire Fabric
4. Reinforcing Steel
5. Permanent Metal Deck Forms
6. Structural Steel
7. Crushed Stone

1.06 INSPECTION AND TESTING LABORATORY SERVICES

A. Three concrete test cylinders shall be prepared by the Contractor under the
supervision of the Engineer for every 20 or less cubic yards of each class of concrete placed each day. The cylinders shall be cured on site under the same conditions as the concrete it represents. Contractor shall pay for all required compression tests of the cylinders.

B. One test for air entrainment and one slump test made by the Contractor under the Engineer's supervision for every 20 or less cubic yards of each class of concrete placed each day.

PART 2 PRODUCTS

2.01 CONCRETE

A. PennDOT Publication 408 Section 704 Class A.

2.02 MORTAR

A. For minor patching of concrete surfaces. Mix one part cement, two parts fine aggregate, and enough water to provide a consistency stiff enough to place by either manual or mechanical tamping. Do not use more than 4 1/2 gallons of water per bag of cement. Mix for 1 minute, cover to prevent loss of moisture, and allow to stand for 45 minutes. Remix for 1 minute without further addition of water, then place within 30 minutes after completion of mixing. Use material as follows:

1. Cement, Type IP, IS, or II - PennDOT Publication 408, Section 701
2. Fine Aggregate, Type A or C - PennDOT Publication 408, Section 703.1
3. Water - Clear and Drinkable

2.03 CONCRETE CURING COMPOUND

A. Water: Clean and drinkable.

B. Liquid Membrane Forming Curing Compound: AASHTO-M148, Type 1-D, Clear or Translucent

2.04 WELDED WIRE FABRIC

A. Plain Type, ANSI/ASTM A185, galvanized finish.

2.05 REINFORCING STEEL

A. ASTM A615, 60 KSI Yield Grade Billet Steel Deformed Bars; uncoated finish.
PART 3 EXECUTION

3.01 WORK WITHIN RIGHT-OF-WAY

The Contractor shall confine all work and storage to the rights-of-way provided.

3.02 MAINTENANCE AND PROTECTION OF VEHICULAR AND PEDESTRIAN TRAFFIC

The roadway shall be kept open at all times and the streets, crosswalks, sidewalks, and driveways shall be kept clean, clear and free for the passage of vehicles or pedestrians, unless otherwise authorized in writing by the Engineer. The Contractor shall in all cases so arrange his work as to cause the least inconvenience to property owners consistent with the proper prosecution of the work as determined by the Engineer.

The Contractor shall construct and maintain, without extra compensation, such adequate and proper bridges over excavations as may be necessary or as directed for the safe accommodation of pedestrians or vehicles. The Contractor shall furnish and erect, without cost to the Owner, substantial barricades at crossing of excavations, or along the excavation to protect the traveling public.

The Contractor shall make all disturbed pavement passable prior to the cessation of construction activity each working day. Excavations shall be repaired with a six (6) inch
topping of PennDOT No. 2A stone, and dust inhibitor such as calcium chloride. The Contractor shall maintain the pavement until it is permanently repaired.

3.03 SUBGRADE PREPARATION

The existing ground surface shall be excavated to the limits and depths indicated in the Plans or as directed by the Engineer to remove all unsuitable material. The subgrade shall be brought to required line, grade and cross section and thoroughly compacted, as determined by the Engineer, using approved ditch rollers or mechanical vibrators.

This operation shall include any reshaping and wetting required along with the rolling or tamping of the subgrade, to obtain proper compaction. All boulders of ledge stone encountered in the excavation shall be removed or broken off to a depth of not less than six (6) inches below the subgrade. The resulting area and all other low sections, holes, or depressions shall be brought to the required grade with material approved by the Engineer, and the entire subgrade shaped to line grade and cross section and thoroughly compacted.

3.04 UNSUITABLE MATERIAL OVEREXCAVATION AND BACKFILL WITH PENNDOT NO. 2A STONE

If the bottom of the excavation (proposed subgrade elevation) is found to be of unsuitable material including ashes, cinders, refuse, vegetable or other organic material or large pieces of inorganic material that in the judgment of the Engineer should be removed, the Contractor shall excavate and remove such unsuitable material to the width and depth ordered by the Engineer and backfilled with compacted PennDOT No. 2A stone.

The contractor will be reimbursed under the item entitled "Unsuitable Material Overexcavation and Backfill with PennDOT No. 2A Stone" based on the quantities determined by the Engineer.

3.05 CONCRETE FORMS AND FINISHING

The Contractor shall field form all of the concrete curb, gutters, and sidewalk to the lines and grades called for in the Plans. The Contractor may utilize wood or metal forms. All forms shall be cleaned thoroughly and greased or soaped before concrete is placed against them.

A. Concrete Curb

Do not remove forms until such time it will not be detrimental to the concrete. Correct irregular surfaces by rubbing with a Carborundum stone. Brush finishing or plastering will not be permitted. Fill minor defects with mortar.
B. Concrete Sidewalk and Driveway

Finish to produce surface with granular or matte texture that will not be slick when wet.

3.06 CONCRETE CURING AND PROTECTION

The concrete shall be cured for three (3) days under four (4) ply, wetted burlap kept saturated with water or by use of a sprayed-on curing compound (chlorinated rubber for concrete sealer and curing compound). Any spots that lighten (dry) shall be resprayed thoroughly. The curing compound shall be suitable for the purpose of curing and sealing the concrete. Once the concrete has been cured and has hardened, the Contractor shall apply two generous coats of linseed oil to all concrete to provide for anti-spalding resistance to salt.

The Contractor shall provide proper barriers and lighting to protect the fresh concrete for the curing period.

3.07 EXPANSION AND CONTROL JOINTS

Expansion joints shall be asphalt impregnated felt paper or a non-extruding expansion joint filler material of the thickness indicated in the plans. Filler joint material shall extend to or slightly below the bottom of the concrete slab. The top edge shall be held 7/8 inch below the surface of the slab by a tack strip of wood with its top flush with the finished curb surface. The edges of the concrete at the joint shall be tooled with an edging tool having a radius of 1/4". After the concrete has cured, the tack strips shall be removed and the joints sealed with a white elastomeric sealing compound to within 1/8 inch of the surface.

All control joints shall be a minimum of 25% of the depth of the slab in depth and be grooved into the concrete by use of a cutting tool. If the Contractor cannot falsemark the concrete to this depth using a cutting tool, then the Engineer will request that the Contractor cut the control joints to deepen them by use of a concrete saw.

3.08 PROTECTION OF EXISTING UTILITIES & STRUCTURES

The existence and location of underground utilities indicated on the plans are not guaranteed and shall be investigated and verified in the field by the Contractor before starting work. Excavation in the vicinity of existing structures and utilities shall be carefully done by hand. The Contractor shall be held responsible for any damage to, and for maintenance and protection of existing utilities and structures. For the protection of both himself and the Owner, the Contractor shall make a survey of adjacent properties before commencing operations. Such a survey shall locate all existing cracks and damages to the existing structures by means of drawings and photographs. Any refusal of Owners of adjacent property to permit entry for purpose of inspections shall be noted in the report.
Where existing utility curb boxes and meter pits exist within the alignment of the proposed concrete, the Contractor shall bring the tops (lids) of such objects flush with the top of the slab in accordance with the respective utility company's requirements. The cost for this work shall be included within the Contractor’s unit price for construction.

3.09 PROTECTION AGAINST VANDALISM

The Contractor shall be responsible for protecting all concrete curb, gutter, sidewalk, and driveway from vandalism. If the concrete curb, gutter, sidewalk, and/or driveway are vandalized, the Engineer may direct the Contractor to remove the vandalized portions of the work and reconstruct them at no additional cost to the Owner.

3.10 ACCOMMODATION OF DRAINAGE

Gutters, sewer drains and ditches shall be kept open at all times. No damming or ponding or water in gutters or other waterways will be permitted. The Contractor shall not direct any flow of water across or over pavements except through approved pipes or properly constructed troughs, and he shall, when so required and at his own cost and expense, provide pipes or troughs of such sizes and lengths as may be required and place the same as may be directed.

The grading in the vicinity of excavations shall be controlled so that the ground surface is properly pitched to prevent water from running into the excavation.

3.11 CLEAN UP

As the improvements are constructed and the work completed, the contractor shall, at his own cost and expense, remove and dispose of all surplus earth, stone, slag, or other material from the work in such manner and at such point or points on the lines or the work covered by the Contract, if so directed by the Engineer; and shall leave all roads, sidewalks and other places free, clear and in good order. In case the contractor fails to do so or to make satisfactory progress in doing so, within twenty-four (24) hours after the receipt of a written notice from the Engineer, the Owner may remove such surplus material and clear the roadways, sidewalks and other places, and the cost of said work shall be charged to the Contractor and deducted from any monies due or to become due him under the Contract.

END OF SECTION 02620
PART 1 - GENERAL

1.01 SUMMARY

1.02 SECTION INCLUDES

  A. Painting and marking of pavements, curbs, guard posts, and light pole bases.

1.03 REFERENCE STANDARDS

  A. American Association of State Highway and Transportation (AASHTO)
     1. AASHTO M248 - Ready-Mixed White and Yellow Traffic Paints

  B. American Society for Testing and Materials (ASTM)
     1. ASTM D4414 - Standard Practice for Measurement of Wet Film Thickness by Notch Gauges.

  C. Federal Specifications (FS)
     1. FS A-A-2886 - Paint, Traffic, Solvent Based (supersedes FS TT-P-85 and FS TT-P-115, Type I)
     2. FS TT-P-1952 - Paint, Traffic And Airfield Marking, Waterborne

1.04 PROJECT CONDITIONS

  A. Maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize flagmen, barricades, warning signs, and warning lights as required.

1.05 QUALITY ASSURANCE

  A. Use trained and experienced personnel in applying the products and operating the equipment required for properly performed work.
PART 2 - PRODUCTS

2.01 Materials

A. Paint shall be waterborne or solvent borne, colors as shown or specified herein. Pavement marking paints shall comply with applicable state and local laws enacted to ensure compliance with Federal Clean Air Standards. Paint materials shall conform to the restrictions of the local Air Pollution Control District.

B. Waterborne Paint: Paints shall conform to FS TT-P-1952.

C. Solvent Borne Paint: Paint shall conform to FS A-A-2883 or AASHTO M248. Paint shall be non-bleeding, quick-drying, and alkyd petroleum base paint suitable for traffic-bearing surface and be mixed in accordance with manufacture's instructions before application for colors White, Yellow, Blue, and Red.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine the work area and correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.02 PREPARATION

A. Sweep and clean surface to eliminate loose material and dust.

B. Where existing pavement markings are indicated on Construction Drawings to be removed or would interfere with adhesion of new paint, a motorized abrasive device shall be used to remove the markings. Equipment employed shall not damage existing paving or create surfaces hazardous to vehicle or pedestrian traffic. Within public rights-of-way, appropriate governing authority shall approve method of marking removal.

C. New pavement surfaces shall be allowed to cure for not less than 30 days before application of marking materials.

3.03 CLEANING EXISTING PAVEMENT MARKINGS

A. In general, markings shall not be placed over existing pavement marking patterns. Existing pavement markings, which are in good condition but interfere or conflict with the newly applied marking patterns, shall be removed. Deteriorated or obscured markings that are not misleading or confusing or do not interfere with the adhesion of the new marking material do not require removal. Whenever
grinding, scraping, sandblasting or other operations are performed, the work shall be conducted in such a manner that the finished pavement surface is not damaged or left in a pattern that is misleading or confusing. When these operations are completed the pavement surface shall be blown off with compressed air to remove residue and debris resulting from the cleaning work.

3.04 APPLICATION

A. Apply two coats of paint at manufacturer's recommended rate, without addition of thinner, with maximum of 100 square feet per gallon or as required to provide a minimum wet film thickness of 15 mils and dry film thickness of 7 ½ mils per coat. Paint shall be applied for a total dry film thickness of 15 mils. Apply with mechanical equipment to produce uniform straight edges. At sidewalk curbs and crosswalks, use straightedge to ensure uniform, clean, and straight stripe.

B. Install pavement markings according to manufacturer's recommended procedures for the specified material.

C. Following items shall be painted with colors noted below:

1. Pedestrian Crosswalks: White
2. Exterior Sidewalk Curbs, Light Pole Bases, and Guard posts: Yellow
3. Fire Lanes: Red or per local code
4. Lane Striping where separating traffic moving in opposite directions: Yellow
5. Lane Striping where separating traffic moving in the same direction: White
6. ADA Symbols: Blue or per local code
7. ADA parking space markings as shown on the drawings.
8. Parking Stall Striping: Yellow, unless otherwise noted on Construction Drawings
9. Associate Parking Area: White, unless otherwise noted on Construction Drawings

3.05 FIELD QUALITY CONTROL

A. Inspection: After the paint has thoroughly dried, visually inspect the entire application and touch up as required to provide clean, straight lines and surfaces throughout.

B. Testing: Testing of wet film thickness shall be performed a minimum of two times on each parking row (including striped islands) and pedestrian crosswalks, and a minimum of one test on each lane/alignment striping. At least one test shall be performed after refilling paint striping machine, changing operators of striping machine, and changing paint types, brands, etc. This shall be performed in
addition to the testing stated above. These tests shall be performed on each coat applied. Testing shall be performed in accordance with ASTM D4414.

3.06 CLEANING

A. Waste materials shall be removed at the end of each workday. Upon completion of the work, all containers and debris shall be removed from the site. Paint spots upon adjacent surfaces shall be carefully removed by approved procedures that will not damage the surfaces and the entire job left clean and acceptable.

3.07 BASIS OF PAYMENT

A. Payment for Pavement Markings shall be included as incidental to Superpave Courses and Shoulder Restoration.

END OF SECTION 02765
SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Includes:

Cast-in-place concrete required for the Work is indicated on the Drawings and includes, but is not necessarily limited to: footings and foundations; slabs on grade; structure and tank walls; elevated slabs; concrete fill in hollow unit masonry for structural columns, etc.; exterior flat work; concrete equipment bases; curbs; piping and conduit encasement, blocking, etc.; and such other concrete as shown on the Drawings and/or as required by these Specifications or as may be reasonably inferred from either.

1.02 QUALITY ASSURANCE

In addition to complying with all pertinent codes, standards and regulations, the Contractor shall comply with all standards referenced in these Specifications and applicable portions of the following standards:

A. "Specifications for Structural Concrete", ACI 301.
B. "Recommended Practice for Measuring, Mixing and Placing Concrete", ACI 304.
C. "Recommended Practice for Hot Weather Concreting", ACI 305.
D. "Recommended Practice for Cold Weather Concreting", ACI 306.
E. "Building Code Requirements for Reinforced Concrete", ACE 318.
I. "Test for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate", ASTM C-88.


M. Deleted.


Q. "Test for Compressive Strength of Cylindrical Concrete Specimens", ASTM C-39.

R. "Method of Sampling Fresh Concrete", ASTM C-172.

S. "Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete", ASTM C-42.

1.03 SUBMITTALS

A. Materials List:

Before any concrete is delivered to the job site, the Contractor shall submit concrete mix design proportions; certified test results for the proposed mix; a complete list of all materials proposed to be furnished and installed under this portion of the Work, showing Manufacturer's name and catalog number of all items such as admixture and membrane; the name and address of the transit-mix concrete supplier; and sufficient additional evidence that the proposed concrete mix of mixes will meet the requirements set forth herein.

B. Transit-mix delivery slips:

A record shall be kept at the job site showing outdoor temperature, time and place of each pour of concrete, together with transit-mix delivery slips certifying the contents of the pour and that all materials conform to the requirements of these Specifications. The delivery slip shall indicate the mix; maximum size of aggregate; amount of mix water; design strength of the concrete; the time when the mix was made and such other information as may be required by the Engineers. Failure to render such slip to the General Contractor job superintendent shall automatically be
cause for rejection of the concrete. The General Contractor's job superintendent shall write on the back of the slip: 1) the time of arrival of the truck mixer on the site; 2) the time of deposit of the concrete from the truck mixer; and 3) the place of deposit of the concrete from the truck mixer. This record shall be made available to the Owner for his inspection upon request. Upon completion of each portion of the Work, the Contractor shall deliver the record and the delivery slips to the Owner. Repeated failure to deliver this information to the Owner may be cause for the Owner to reject the deposited concrete at any time and to require that it be removed and replaced at the Contractor's expense.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cement shall be Portland Cement, conforming to ASTM C-150, Type IA, or in the event that field conditions require, and where approved, high-early strength Portland Cement, Type IIIA. All cement shall be obtained from one source. Cement used in the Work shall correspond to that upon which the selection of concrete proportions was based.

B. Aggregates shall conform to ASTM C-33, except as revised herein. Aggregates failing to meet the aforementioned standard, but which have been shown by special test or actual service to produce concrete of adequate strength and durability, may be used when specifically approved by the Engineer. Additional specific requirements for aggregates are as follows:

1. Fine aggregates shall be clean, hard, natural sand. When tested in accordance with ASTM C-117, the weight removed by the test shall not exceed 3%. The amount of coal and clay shall not exceed 0.25% and 1% respectively.

2. Coarse aggregates shall consist of crushed stone or crushed gravel. When tested in accordance with ASTM C-88, the loss shall not exceed 10%, and when tested in accordance with ASTM C-131, the loss shall not exceed 45%.

3. The nominal maximum size of coarse aggregate shall not be larger than one-fifth the narrowest dimension between sides of forms; nor one-third the depth of slabs; nor three-fourths the minimum clear spacing between individual reinforcing bars or wires, bundles of bars, or prestressing tendons or ducts. In no case shall the maximum size exceed 1-1/2 inches. For section of 12 inch thickness or less, the maximum size shall not exceed 1 inch. Coarse aggregate gradations shall conform to ASTM C-33 for the types of concrete being used in this Work as described hereafter.
C. Water used in mixing and curing concrete shall be fresh, clean and free from injurious amounts of sewage, oil, acid, alkali, organic matter or other deleterious substances. Water shall be approved for human consumption.

D. Admixtures to be used in concrete shall be subject to prior approval by the Owner. Air-entraining admixtures shall conform to ASTM C-260. Water reducing admixtures, retarding admixtures, accelerating admixtures, water-reducing and retarding admixtures, and water-reducing and accelerating admixtures shall conform to ASTM C-494. Fly ash will not be permitted on this Project. Other pozzolans such as plasticizers used as admixtures shall conform to ASTM C-618. Admixture proportions shall be in strict accordance with the Manufacturer's recommendations and must approved by the Engineer prior to using same.

2.02 CONCRETE

A. For the purposes of this Project, the following minimum criteria for the various classes of concrete shall be established:

<table>
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<tr>
<th>Class of Concrete</th>
<th>Compressive Strength</th>
<th>Coarse Aggregate ASTM C-33 Size No.</th>
<th>Cement Per Bag Mix</th>
<th>CY of Concrete</th>
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<tbody>
<tr>
<td>Class A</td>
<td>4,000 psi</td>
<td>No. 467 or 57</td>
<td>6 1/2 Bag Mix</td>
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</table>

B. Proportions of materials for concrete shall be established to provide adequate workability and proper consistency to permit concrete to be worked readily into the forms and around reinforcement under conditions of placement to be employed without excessive segregation bleeding; to provide resistance to freezing and thawing and other aggressive actions; and to provide conformance with the strength requirements as established by these Specifications. Methods of determining proportions and design mixes shall conform to ACI 318. All concrete, unless otherwise approved, shall be transit-mixed in accordance with ASTM C-94. Concrete shall, unless otherwise specified or approved, be air-entrained conforming to ACI 318. The slump of the concrete mix shall not in any case exceed 3 inches for heavy sections or suspended or at-grade floors, or 4 inches elsewhere.

C. The use of admixtures will be considered provided that the Contractor submits sufficient evidence that the concrete produced will meet the requirements of these Specifications and that such admixtures are capable of maintaining essentially the same composition and performance throughout the Work as the project used in establishing concrete proportions. Admixtures containing chloride ions shall not be used in concrete containing aluminum embedments if their use will produce a deleterious concentration of chloride ions in the mixing water. The use of flyash will not be permitted in concrete for this Project.
D. Concrete shall be Class A at all locations unless otherwise specified. Class B concrete shall be used in walls and slabs 6 inches or less in thickness; and for closing openings in walls around pipes. Class C concrete shall be used for pipe cradle backfill or as shown on the Drawings.

2.03 MEMBRANES

A. All vapor barrier membrane under concrete slabs shall be 6-mil weight sheet plastic in sheet as wide as possible to minimize joints.

B. All curing membrane shall be sheet plastic as specified for vapor barrier, a combination sheet plastic and paper, or an equal approved in advance by the Engineer.

C. All cement or tape used for sealing membrane joints shall be only as recommended by the Manufacturer of the membrane being joined.

2.04 OTHER MATERIALS

A. Preformed expansion joint filler shall be a self-expanding cork conforming to ASTM D-1752, Type III as manufactured by Serviced Products Division, W.R. Grace & Co., Sonoflex Cork as manufactured by Sonneborn-Contech, or approved equal.

B. Epoxy bonding compounds shall be Sikastik 370 as manufactured by Sika Chemical Corporation; Concreseive 1001-LPL or 1180 as manufactured by Adhesive Engineering Company; Sonobond as Manufactured by Sonneborn-Contech; or approved equal. Products shall be suitable for use on horizontal or vertical surfaces as required for the Work and applied in accordance with the Manufacturer's recommendations.

C. Premixed non-shrink grout shall be Vibro Foil as manufactured by W.R. Grace & Co.; Embeco 636 as manufactured by Master Builders; or approved equal.

D. Materials for repair of existing concrete surfaces shall be Colma Dur LV, Colma Dur Gel and/or Colma Fix LV as manufactured by Sika Chemical Corporation, similar products as manufactured by American Metaseal Company, or approved equal, and shall be installed in accordance with the Manufacturer's recommendations and the requirements of this Section.

E. All other materials not specifically described but required for a complete and proper installation of cast-in-place concrete shall be as selected by the Contractor subject to the approval of the Engineer. Materials identified on the Drawings by Manufacturer or product name shall conform to the standard specifications for the particular manufactured product.
PART 3 - EXECUTION

3.01 PREPARATION

Preparation of equipment and place of deposits of concrete shall conform to ACI 318 and ACI 614. The Contractor shall notify the Engineer at least 48 hours before placing concrete.

3.02 MIXING AND PLACING CONCRETE

A. Mixing and placing concrete shall be done in accordance with appropriate portions of ASTM C-94, ACI 318 and/or ACI 304, except as modified or revised by these Specifications.

B. Before deposition of concrete, all debris shall be removed from the space to be occupied by the concrete. Forms, if constructed of lumber, shall be thoroughly wetted except in freezing weather. Reinforcement, pipe sleeves and other materials to be embedded in the concrete shall be thoroughly secured in position and cleaned of ice of other deleterious substances. Water shall be removed from the space to be occupied by the concrete before concrete is deposited.

C. Forms for walls or thin sections of considerable height shall be provided with openings or other devices that will prevent segregation and accumulation of hardened concrete on the forms or on the metal reinforcement above the level of the concrete.

D. Where concrete is conveyed to chutes, the equipment shall be of such size and design as to insure a continuous flow in the chute. The chutes shall be of metal, or metal-lined, and if two or more lengths are used, they shall have approximately the same slope. The slope shall not be less than one vertical to three horizontal nor more than one vertical to two horizontal and shall be such as to prevent the segregation of the ingredients. The discharge end of the chute shall be provided with a baffle plate to prevent segregation. If the distance of the discharge end of the chute above the surface of the concrete is more than 3 times the thickness of the layer being deposited, or more than 4 feet above the surface of the concrete, a spout or "elephant trunk" shall be used, and the lower end maintained as near to the surface of deposit as practical. When the operation is intermittent, the chute shall discharge into a hopper. The chute shall be thoroughly cleaned before and after each run and the debris from any water used shall be discharged outside the forms.

E. Before depositing new concrete on or against concrete which has hardened and to which it is to bond, the forms shall be re-tightened. The surface of the hardened concrete shall be roughened in a manner that will not leave loosened particles of aggregate or damaged concrete at the surface. It shall be thoroughly cleaned of foreign matter and laitance, and saturated with water. To insure an excess of mortar...
at the juncture of the hardened and newly deposited concrete, the cleaned and saturated surface, including inclined surfaces, shall be first thoroughly covered with a coating of mortar or neat cement grout against which the new concrete shall be placed before the grout has attained its initial set. Epoxy bonding compound shall be used where new concrete is to be deposited on or against existing concrete surfaces and/or where indicated on the Drawings. It shall be applied in accordance with the Manufacturer’s recommendations.

F. Concrete during and immediately after deposition shall be thoroughly compacted by means of vibration. The number of vibrators used shall at all times be subject to the approval of the Engineer. The concrete shall be thoroughly worked around the reinforcement, around embedded fixtures, and into the corners of the forms. The accumulation of water on the surface of the concrete due to water gain, segregation, or other causes during placement and compacting shall be prevented as far as possible by adjustments in the mixture. Provision shall be made for the removal of such accumulated water so that under no circumstances will concrete be placed in such accumulation.

G. To minimize the formation of laitance, great care shall be exercised to disturb the concrete as little as possible while it is being deposited. Upon completion of a section of concrete, all laitance shall be entirely removed before Work is resumed. The Contractor shall submit to the Engineer, prior to start of Work, the details of procedures he proposes to use to minimize and control the development of shrinkage cracks.

H. Sufficient time must elapse after depositing concrete in the walls for the walls to obtain sufficient strength before depositing concrete in beams, girders, or slabs supported thereon. Beams and girders shall be considered as part of the floor system and shall be placed monolithically therewith.

3.03 SAMPLING AND TESTING REQUIREMENTS

A. The Contractor shall provide and pay for sampling and testing of the concrete incorporated into the Work by an approved Independent Testing Laboratory (ITL). All test results must be furnished to the Engineer within five (5) days following the date of testing. Failure to submit test results in accordance with this provision will be deemed sufficient cause for the Engineer to reject the respective concrete incorporated in the Work.

B. One test shall be made for each pour and each 25 cubic yards of concrete placed. The laboratory shall maintain records showing brands of cement, brand and quality of admixtures, time and location of the batch form which the test was made, air content, slump and compressive strength. The laboratory shall supply the test cylinders, slump cones, field technicians and all equipment necessary for performance of field and laboratory testing specified herein.
C. One strength test shall consist of four field specimens, one (1) specimen for testing at seven (7) days, one (1) specimen for testing at fourteen (14) days, and two (2) specimens for testing at twenty-eight (28) days. The samples for strength tests shall be taken in accordance with ASTM C0-172. Cylinders for acceptance tests shall be molded and laboratory cured in accordance with ASTM C-31 and tested in accordance with ASTM C-39. Each strength test result shall be the average of two cylinders from the same sample tested at seven (7), fourteen (14), and twenty-eight (28) days.

D. When the frequency of testing will provide less than five strength tests for a given class of concrete, test shall be made from five randomly selected batches or from each batch if fewer than five are used. When the total quantity of a given class of concrete is less than 50 cubic yards, the strength tests may be waived by the Engineer if, in his judgment, adequate evidence of satisfactory strength is provided.

E. Strength tests of specimens cured under field conditions in accordance with ASTM C-31 may be required by the Engineer to check the adequacy of curing and protection of the concrete in the structure. Such specimens shall be molded at the same time and from the same samples as the laboratory-cured acceptance test specimens. Procedures for protecting and curing the concrete shall be improved when strength of field-cured cylinders at the test age designated for measuring specified strength (f'c) is less than 85% of that of the companion laboratory-cured cylinders. When the laboratory-cured cylinder strengths are appreciably higher than specified strength (f'c) the field-cured cylinder strengths need not exceed f'c by more than 500 psi, even though the 85% criterion is not met.

F. Non-compliance and/or non-satisfactory strength test results shall be determined by the Engineer and/or Contractor and such information will be relayed expeditiously to the concrete supplier and confirmed promptly in writing. Test results of concrete furnished subsequent to such notification shall comply or a second warning will be issued. Non-compliance after two warnings will be sufficient cause to refuse additional concrete from the non-complying concrete supplier.

G. Reinstatement of a disqualified concrete supplier may be permitted only upon certification by an independent qualified engineer, retained by the concrete supplier and acceptable to the Engineer, attesting to the fact that adequate corrective measures have been taken. Failure after this point will result from the job. Any additional cost resulting therefrom will be the responsibility of the General Contractor.

H. Should individual test of laboratory-cured specimens produce strengths more than 500 psi below specified strength (f'c), or should tests of field cured cylinders indicate deficiencies in protection and curing, steps shall be taken to assure that load-carrying capacity of the structure is not jeopardized. If the likelihood of low
strength concrete is confirmed and computations indicate that the load-carrying capacity may have been significantly reduced, tests of cores drilled from the area in question may be required in accordance with ASTM C-42. Three cores shall be taken for each cylinder test more than 500 psi below specified strength (f'c).

If the concrete in the structure will be dry under service conditions, the cores shall be air-dried (temperature 60°F to 80°F, relative humidity less than 60%) for 7 days before the test and shall be tested dry. If the concrete in the structure will be more than superficially wet under service conditions, the cores shall be immersed in water for at least 48 hours and then tested wet.

I. Concrete represented by the core tests will be considered structurally adequate if the average of the three cores is equal to at least 85% of specified strength (f'c) and if no single core is less than 75% of f'c. To check testing accuracy, locations represented by erratic core strengths may be retested. If these strength acceptance criteria are not met by the core tests, and if structural adequacy remains in doubt, the Engineer may order load tests for the questionable portion of the structure, or take other appropriate action, which may include the complete replacement of the defective portion.

J. Costs of all sampling and testing as specified herein shall be paid for by the Contractor.

3.04 PLACING CONCRETE IN COLD OR HOT WEATHER

A. When the temperature of the surrounding air is below 40°F or above 90°F, concrete placement shall be performed in accordance with the provisions of ACI 306 or ACI 305, respectively, except as modified or revised by these Specifications.

B. During cold weather, the concrete shall be maintained at a temperature of 55°F for Class B concrete and 50°F for Class A or Class C concrete for a minimum of five days after placing. During this period concrete and adjacent form surfaces shall be kept moist at all times. When heated enclosures are to be provided, care shall be taken to provide adequate space around the other edges and top of the concrete structure to permit circulation of the heated air, so that neither freezing nor excessive heating of these extremities can occur. All facilities for protection and heating must be on hand before the concrete is placed.

C. After the required protection period is over, the heat shall be removed gradually and uniformly so that there will be a temperature differential of no more than 40°F over any 24-hour period.

D. Forms shall not be removed from the concrete surface during the protection period of three (3) days during those seasons of the year when the difference between the daily high and low temperatures may reasonably be expected to exceed 40°F.
E. At air temperatures of 90°F or above, concrete should be kept as cool as possible during placing and curing. Concrete surfaces shall be kept continuously moist by wet-curing for at least 24 hours after the concrete has been place and water shall be applied to formed surfaces while forms are still in place. After the period of wet curing, a suitable heat-reflecting plastic membrane or white-pigmented curing compound may be used.

3.05 DEFECTIVE CONCRETE

A. Defective concrete is defined as concrete, in place which does not conform to the strength, shapes, alignments or elevations as shown on the Drawings and/or which presents faulty surface areas.

B. All defective concrete shall be removed and replaced in a manner meeting with the approval of the Engineer or, should only surface imperfections occur, may be patched at the discretion of and in a manner satisfactory to the Engineer; however, permission to patch the Work shall not be considered as a waiver of the Owner's right to require complete removal and replacement of such defective concrete should the patching fail to satisfactorily restore the required quality and/or appearance of the surface.

C. Surface defects that require replacement or repair are those that consist of honeycomb; damage due to stripping forms; loose pieces of concrete; surface holes caused by bolts and ties; excessive ridges at form joints; and bulges due to movement of the forms. Ridges and bulges shall be removed by chipping, tooling or grinding on finished surfaces. Honeycomb and other defective concrete shall be chipped out and filled with mortar, the chipped openings having sharp edges and shaped so that the mortar filling will be keyed in place. All holes shall be kept thoroughly moistened for several hours before mortar filling is place.

D. Imperfections, bolt and tie-rod holes, and chipped-out honeycomb areas to be repaired shall be filled with drypatching mortar composed of one part of Portland Cement to two parts of regular concrete sand (volume measurement) and just enough water so that, after the ingredients are mixed thoroughly, the mortar will stick together on being molded into a ball by slight pressure of the hands, and not exude free water. Mortar repairs shall be placed in thin layers thoroughly compacted by suitable tools. Care shall be taken in filling rod and bolt holes so that the entire depth of the hole is completely filled with compacted mortar. "Embeco", or equal, shall be added to all patching mortar in an amount as recommended by the Manufacturer for the mix to be used except for unpainted, exposed surfaces.
3.06 CONSTRUCTION JOINTS

The Contractor shall make and locate construction joints so as not to impair the strength of the structure. The Contractor shall obtain the Engineer's approval of the locations of all construction joints and control joints in the Work prior to the start of concrete placement.

3.07 CONCRETE FINISHING

A. All concrete surfaces shall be finished as specified as soon after the placing of concrete and removal of forms as conditions will permit. All patching and pointing shall be performed immediately after the forms have been removed and rubbing of concrete surfaces shall be performed as soon as possible thereafter.

B. All exposed formed concrete surfaces on the interior of structures; on the interior of tanks containing liquids from the top to a point 1 foot below the lowest working liquid level shown on the Drawings; or on the exterior of structures or appendages from the top to a depth of 1 foot below finished grade shall receive a rubbed finish. Unless otherwise specified, all other formed concrete surfaces shall be pointed with mortar as described herein and shall be pointed with mortar as described herein and shall have all fins and projections in excess of 1/8 inch removed. Form ties shall be removed to a depth of at least 1 inch beneath the surface and all air bubbles, cavities, stone pockets, honeycombing and tie and bolt holes shall be pointed with mortar. The mortar mix shall be determined by trial to obtain a good color match with the concrete when both the patch and concrete and cured and dry.

The amount of mixing water shall be the minimum possible consistent with the requirements for handling and placing the mortar. Fins, form marks, projections and uneven spots shall be removed by rubbing or grinding and surfaces left smooth, dense and free of grain marking and bulges or depressions more than 1/8-inch in 4 feet. When the mortar pointing has set and when rubbed finish is required, the entire exposed surface shall be thoroughly covered with water and rubbed with a carborundum brick or other approved means to remove all blemishes and provide a smooth finish of uniform texture and appearance.

C. Unless otherwise indicated, the tops of all exposed walls or steps and all slabs or flat unformed concrete surfaces shall be struck off to establish grade and floated with a wood float until all irregularities are removed, as a minimum, to produce a relatively smooth, level and even textured surface without sharp ridges. All interior floors, platforms and flume bottoms which are exposed to view shall receive a steel trowel finish once all excess water has evaporated from the floated surface. Tolerance from finish surface lines shall be a maximum of 1/8-inch in 10 feet with maximum high and low variances not occurring in less than 20 feet and with 1/16-inch tolerances in any one running foot with no abrupt variations. Floors shall slope uniformly to floor drains where they are provided.
D. Additional finishing shall be provided as required in Division 9 for those surfaces which are to receive paints or protective coatings, damproofing and other treatments, and be in accordance with the recommendations of the coating Manufacturer.

E. All concrete stairs, steps, platforms, landings and sidewalks and shall receive an application of 1/2-pound per square foot of silicon carbide grit. Surfaces receiving grit shall be finished with a wood float to provide a non-skid walking surface.

3.08 CONCRETE CURING

A. Protection against loss of moisture from the surface of the concrete shall be accomplished by keeping the surface continuously wet. One of the following methods shall be used: surface remaining in contact with the form; the covering with burlap or mottin mats kept continuously wet and covered with polyethylene plastic; or continuous sprinkling of the expose surfaces.

B. No curing compounds shall be used on any surfaces to which pneumatic mortar is to be applied, or on which any other type of concrete mortar, paint or chemical waterproofing coating is to be used unless they are compatible with the intended coating and approved by the Engineer. In addition, curing compounds shall not be used on any concrete which will be used to store potable water.

C. During cold or hot weather, curing shall be as specified under "Placing Concrete in Cold or Hot Weather".

3.09 REPAIR OF EXISTING CONCRETE SURFACES

A. All existing surfaces, particularly those to be painted and/or surfaces roughened or damaged by demolition, cutting or patching shall be patched and/or repaired as required to produce a uniform surface suitable for the application of coatings and in accordance with the coating manufacturer's recommendations. Non-shrinking grout shall be used to fill all holes in existing surfaces; holes left due to the removal of existing equipment and facilities; or holes made as required for the installation of new equipment for the facilities. The methods of patching and/or repairing shall conform to the recommendations of the Manufacturer of the patching compounds or sealers used.

END OF SECTION 03300
## SECTION 01000

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### END OF SECTION
SECTION 01001

SPECIAL PROVISIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES:

A. Special Provisions related to the Technical Specifications.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment, machinery, apparatus and tools, and perform all operations necessary to install, equip and put in to satisfactory operation, the work specified herein and shown on the Drawings. All work shall be done in accordance with applicable portions of the Specifications. Any labor, materials, equipment, or apparatus not specifically mentioned herein or shown on the Drawings, which may be necessary for the proper completion of the entire work or of the individual items thereof, within the intent of these Specifications and Drawings, shall be furnished by the Contractor without additional compensation.

B. All work described in these Specifications and as shown on the Drawings shall be conducted in a manner to avoid any and all interruption of the current operations at the Maple Terrace Head Start facility. Contractor shall prepare a detailed work schedule and submit to Owner and Engineer for review and approval.

If interruptions must be made by the Contractor to the existing site functions, the Contractor shall notify the Owner and the Engineer in formal writing concern the known interruptions.

3.2 SPECIFICATIONS INCORPORATED BY REFERENCE

The latest edition of the Pennsylvania Department of Transportation (PennDOT) Publication 408 Specifications, and all supplements thereto, are incorporated by reference into these Technical Specifications.

3.3 STANDARD DRAWINGS INCORPORATED BY REFERENCE

The latest edition of the Pennsylvania Department of Transportation (PennDOT) Standard Drawings are incorporated by reference into these Technical Specifications.

3.4 LOCAL ROADS
A. The Contractor shall cooperate with municipal officials in maintaining safe and passable conditions on all roads, streets, and alleys affected by the work. Detours may be established only with written approval of officials having jurisdiction. A copy of such approval must be submitted to the Owner’s Representative and approved by him before becoming effective. Nothing in this section shall operate to release the Contractor from his responsibilities under his Surety Bond.

3.5 EXISTING UTILITIES

A. The Contractor is cautioned of the existence in the project area of underground utility lines. Every reasonable effort has been made to show the existence and location of the known utility lines in the general area of project construction. However, this information cannot be guaranteed as being accurate.

The depth and size of all existing utilities in the project area shall be verified in the field by the Contractor with a representative from the appropriate utility company. The Contractor shall be responsible for notifying all utility companies at least seventy-two (72) hours before any work commences on this project.

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3.6 ENGINEERING STAKES

A. The Contractor is responsible for the stakeout of all construction work included in this Contract. The Contractor shall furnish the Engineer with such assistance as he may require in checking any alignment, elevation or measurement of the Contractor’s work.

B. The Contractor is responsible to establish appropriate control stakes to establish roadway alignment and installation of proposed utilities per design locations.

3.7 AS-BUILT PLANS

A. The Contractor is required to maintain accurate and complete logs of his work of any locations where the proposed work is revised from that shown on the Plans. This shall include dimensions to show surface features. All revisions will be noted on a set of Plans in a neat fashion. The Contractor shall give these to the Engineer at the completion of the work so that the Engineer can prepare "As-Built" Plans for the Owner.

PART 4 - BASIS OF PAYMENT

4.1 Special Provisions – Incidental. No additional compensation.

END OF SECTION
SECTION 01090

REFERENCE STANDARDS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Quality assurance.

B. Schedules of references.

1.2 QUALITY ASSURANCE

A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date of Contract Documents.

C. Obtain copies of standards when required by Contract Documents.

D. Should specified reference standards conflict with Contract Documents, request clarification from the Engineer before proceeding.

E. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.3 REFERENCES

AA  Aluminum Association
818 Connecticut Avenue, N.W.
Washington, DC 20006

AABC Associated Air Balance Council
1000 Vermont Avenue, N.W.
Washington, DC 20005

AASHTO American Association of State Highway and Transportation Officials
444 North Capitol Street, N.W.
Washington, DC 20001

ACI American Concrete Institute
Box 19150
Reford Station
Detroit, MI 48219
<table>
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<tr>
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<td>ADC</td>
<td>Air Diffusion Council</td>
<td>230 North Michigan Avenue</td>
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<tr>
<td></td>
<td></td>
<td>Chicago, IL 60601</td>
</tr>
<tr>
<td>AIA</td>
<td>American Institute of Architects</td>
<td>1735 New York Avenue, N.W.</td>
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<tr>
<td></td>
<td></td>
<td>Washington, DC 20006</td>
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<tr>
<td>AISC</td>
<td>American Institute of Steel Construction</td>
<td>400 North Michigan Avenue</td>
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<td>Chicago, IL 60611</td>
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<td>AISI</td>
<td>American Iron and Steel Institute</td>
<td>1000 16th Street, N.W.</td>
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<td>AMCA</td>
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<td>30 West University Drive</td>
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<td>APA</td>
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<td>ARI</td>
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<td>1815 North Fort Myer Drive</td>
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<td>Arlington, VA 22209</td>
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<td>ASTM</td>
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<td>1916 Race Street</td>
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<td>AWWA</td>
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<td>2310 South Walter Reed Drive</td>
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<td>AWPA</td>
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<td>7735 Old Georgetown Road</td>
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<td>550 LeJeune Road</td>
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<td>933 Plum Grove Road</td>
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<td>707 Westchester Avenue</td>
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<td>FGMA</td>
<td>Flat Glass Marketing Association</td>
<td>3310 Harrison</td>
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<td>FM</td>
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<td>GA</td>
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<td>1603 Orrington Avenue</td>
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<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
<td>345 East 47th Street</td>
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<tr>
<td>IMIAC</td>
<td>International Masonry Industry All-Weather Council</td>
<td>815 15th Street, N.W.</td>
</tr>
</tbody>
</table>
MIL  Military Specification
    Naval Publications and Forms Center
    5801 Tabor Avenue
    Philadelphia, PA  19120

ML/SFA  Metal Lath/Steel Framing Association
    221 North LaSalle Street
    Chicago, IL  60601

NAAMM  National Association of Architectural Metal Manufacturers
    21 North LaSalle Street
    Chicago, IL  60601

NEMA  National Electrical Manufacturers' Association
    2101 L Street, N.W.
    Washington, DC 20037

NFPA  National Fire Protection Association
    1619 Massachusetts Avenue, N.W.
    Washington, DC 20036

PennDOT  Commonwealth of Pennsylvania
    Department of Transportation

PCA  Portland Cement Association
    5420 Old Orchard Road
    Skokie, IL  60077

PS  Product Standard
    U.S. Department of Commerce
    Washington, DC  20203

SDI  Steel Deck Institute
    Box 3812
    St. Louis, MO  63122

SDI  Steel Door Institute
    712 Lakewood Center North
    Cleveland, OH  44107

SMACNA  Sheet Metal and Air Conditioning Contractors'
    8224 Old Court House Road
    Vienna, VA  22180

SSPC  Steel Structures Paint Council
    4400 Fifth Avenue
    Pittsburgh, PA  15213
PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

PART 4 - BASIS OF PAYMENT

Not Used.

END OF SECTION
SECTION 01300

APPROVED EQUAL MATERIALS AND PRODUCTS AND SUBMITTALS

PART 1 - GENERAL

1.1 SECTION INCLUDES:

A. Approved Equal Materials and Products.
B. Submittals.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 DESCRIPTION

A. Wherever possible throughout the Contract Documents, the minimum acceptable quality of workmanship and materials has been defined by the manufacturer's name and catalog number, reference to recognized industry and government standards, or description of required attributes and performance.

To ensure that the specified products are furnished and installed in accordance with design intent, these procedures have been established for the submission and approval of equal materials and products prior to the opening of bids and the submission and approval of all specified materials and products and duly approved equal materials and products following the award of the Contract.

3.2 APPROVED EQUAL MATERIALS AND PRODUCTS

A. The various materials and products specified in the Contract Documents by name and description are provided to establish a standard of quality. It is not the intent to limit the acceptance to any one material or product specified, but rather to name or describe a material or product as a minimum standard that is desired and acceptable. Where proprietary names are used, whether or not followed by the words "or approved equal", "equal to", or "or equal," equal materials and products may be approved by the Owner’s Representative.

B. Any Bidder who desires to have alternate manufacturer’s equipment considered as equal to that named in these Specifications shall do the following: The Bidder shall submit to the Owner’s Representative three (3) copies of detailed computations, shop drawings, certified, stamped, and sealed by a Registered Pennsylvania Professional Engineer, samples, and/or manufacturer’s literature as required to document that the proposed equal material or product meets or exceeds the Specifications. These shop drawings shall clearly identify and illustrate any discrepancies or revisions required to make the alternate equipment fit, connect, and operate as the intended design, including electrical design and charge requirements. The perspective Bidder and/or alternate manufacturer shall pay all costs to the Owner’s Representative for design engineering and construction costs (if any) required to make the alternate equipment fit and work
in accordance with these Contract Documents. This shall be done no less than ten (10) days prior to Bid Opening date so the Owner’s Representative has adequate time to review the information submitted.

C. Upon completion of review of this material, the Owner’s Representative shall determine whether the alternate item meets the appropriate Specifications. If the Owner’s Representative feels that the alternate material is acceptable and meets the Specifications, the Owner’s Representative shall notify all perspective Bidders of such by Addendum. By doing this, all Bidders will have the option to formulate their Bid using either the specified item or the “approved equal” item.

D. If the Owner’s Representative deems that an alternate material is not considered equal to that specified, the Owner’s Representative shall notify only the Bidder or manufacturer’s agent who submitted the prequalification material of his denial.

E. The decision of the Owner’s Representative regarding whether to approve an alternate material or item shall be final. There shall be no consideration of alternate items after Bid Opening.

3.3 SUBMITTALS

A. Within ten (10) days after the award of the Contract and before any items are submitted for approval, the Contractor shall submit to the Owner’s Representative three (3) copies of a submittal schedule. The Contractor shall compile a complete and comprehensive schedule of all submittals anticipated during progress of the work. The Contractor shall include a list of each type of item for which Contractor’s drawings, Shop Drawings, Certificates of Compliance, material samples, guarantees, or other types of submittals are required. Upon approval by the Owner’s Representative, this schedule will become part of the Contract and the Contractor will be required to adhere to the schedule except when specifically otherwise permitted.

B. Submittals shall be made for all materials and products used in the Project. The Contractor shall assume all liability for proceeding without approval of the submittals and/or for using materials and products not approved by the Owner’s Representative.

C. Unless the precise color and pattern is specifically described in the Contract Documents, and whenever a choice of color or pattern is available in a specified product, the Contractor shall submit accurate color and pattern charts to the Owner’s Representative for review and selection.

D. The Contractor shall certify that any materials and products used in the work comply with all specified provisions thereof. Certification shall not be construed as relieving the Contractor from furnishing satisfactory materials if, after tests are performed on selected samples, the material is found to not meet specified requirements.

Certification shall be in the form of letter or company standard forms containing all required data. Certificates shall be signed by an officer of the manufacturing or fabricating company.
PART 4 - BASIS OF PAYMENT

4.1 Approved Equal Materials and Products and Submittals-Incidental. No additional compensation.

END OF SECTION
SECTION 01350

PROJECT SCHEDULE

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. The general requirements and procedures for preparing and maintaining the project schedule, including guidelines for the progress schedule, submittals, monthly status reports, and recovery schedule.

1.2 RELATED DOCUMENTS AND SECTIONS

A. Provisions of the Contract Documents shall apply to the work of this section.
B. Section 01300 – Submittals

1.3 MEASUREMENT AND PAYMENT

A. No separate measurement nor payment will be made for work required under this section. All cost in connection therewith will be included in the various bid items.

1.4 SUBMITTALS

A. Comply with Division 1, Section 01300 – Submittals.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.01 PROGRESS SCHEDULE

A. The Contractor shall submit a Progress Schedule as follows:

Submit a detailed List of Activities within five (5) calendar days after effective date of Notice to Proceed showing all activities to be started within the following thirty (30) days. This list shall be updated and resubmitted to the Owner every thirty (30) days during the Contract period, submitted with the contractor’s payment estimate. Show the anticipated starting time, duration and time of completion of all activities required to complete all construction. Identify the anticipated critical path of activities and highlight them on the schedule.

B. Recovery Schedule:

1. If the Owner determines at any time for any reason that the work has fallen behind the Contract schedule or milestone dates, the Contractor shall submit a written and documented Recovery Schedule within seven (7) calendar days of the Owner’s written request. Document in the
Recovery Schedule all additional resources, including materials, equipment and labor, and modifications of operations which will be provided so as to meet the Schedule. Provide all such additional resources and modifications of operations without additional cost to the Owner. Such additional resources and modifications shall include but not be limited to:

a. Required overtime for the Contractor's personnel.

b. Increased construction manpower in such quantities as will substantially eliminate the backlog of work and put the project back on schedule.

c. Increased numbers of shifts per working day, working days per week, or the amount of construction equipment, or any combination of the foregoing which will put the project back on schedule.

d. Rescheduled activities to achieve the maximum practical concurrence of accomplishment of activities to put the project back on schedule.

e. Supplemental progress schedules detailing the specific operation changes instituted to regain the Contract Schedule.

2. Implement the Recovery Schedule without additional cost to the Owner and provide for completion of the work in accordance with the remaining milestone dates without a time extension. Should the durations of the Recovery Schedule not receive acceptance of the Owner, be responsible to use concurrent operations, additional manpower, additional shifts, overtime, etc., including a 24-hour productive work day, seven (7) day work week operation, as required to put the project back on schedule at no additional cost to the Owner.

3. Material breach of contract shall result from failure to provide the Owner with the required schedules and failure to implement such schedules immediately.

END OF SECTION 01350
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Mobilization.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 This work is the assembly and set-up of the general plant required to comply with the contract and with local and state laws and regulations. General plant includes contractor's offices, shops, plants, storage areas, and sanitary or other facilities, if required. The work includes obtaining the required permits, insurance, bonds, and any other initial items required for the start of the work.

3.2 Provide adequate material and furnishings required. These material and furnishings will not be considered a part of the other completed contract items.

PART 4 - BASIS OF PAYMENT

4.1 Mobilization - Lump Sum in accordance with the following schedule:

A. Whenever work is performed equal to 10% of the total contract price, excluding the bid price for this item, the amount bid for mobilization or 3% of the total contract price, excluding the bid price for this item, whichever is less, will be paid.

B. Whenever work is performed equal to 25% of the total contract price, excluding the bid price for this item, any remaining amount bid for mobilization or an additional 2% of the total contract price, excluding the bid price for this item, whichever is less, will be paid.

C. Upon completion of the project, any remaining amount bid for mobilization will be paid.

END OF SECTION
SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Provisions of the Contract Documents shall apply to all work of this section.

1.02 DESCRIPTION OF WORK

A. Closeout: Regards the general requirements near the end of the Contract Time, in preparation for final acceptance, final payment, normal termination of contract, occupancy by Owner and similar actions indicating completion of the work. Time of closeout is directly related to "Completion," and therefore may be either a single time period for entire work or a series of time periods for individual parts of the work which have been certified as complete at different dates. The completion time variation, if any, shall be applicable to other provisions of this section, regardless of whether resulting from "phased completion" originally specified by the Contract Documents or subsequently agreed upon by the Owner and Contractor.

1.03 RELATED SECTIONS

A. Related work specified in other sections is as follows:

1. Specific requirements for individual units of work: Other Sections.

2. Final payment requirements: Articles of Agreement.

3. General submittal requirements: Section 01300 – Submittals.

1.04 PREREQUISITES TO SUBSTANTIAL COMPLETION

A. General: Prior to requesting from the Owner inspection for Certification of Substantial Completion, for either the entire work or portions thereof, complete the following and list known exceptions in the request:

1. In the progress payment request, coincident with or first following date claimed, shown either 100% completion for portion of work claimed as “substantially complete,” or list incomplete items, value of incompletion, and reasons for being incomplete as indicated in the Contract Documents.

2. Submit statement showing accounting of changes to the Contract sum.
1.05 PREREQUISITES TO FINAL ACCEPTANCE

Not used.

1.06 MEASUREMENT AND PAYMENT

A. No separate measurement nor payment will be made for work required under this section. All cost in connection therewith will be included in the various bid items for this Contract work.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.01 FINAL INSPECTION

A. Final payment is not to be made until such Final Inspection is made and the work is acceptable to the Owner.

3.02 CONTINUING INSPECTIONS

A. Except as otherwise required by specific warranties, agreement to maintain, workmanship/maintenance bonds, and similar continuing commitments, comply with Owner’s requests to participate in inspections at end of each time period of such continuing commitment. Also participate in a general Final Inspection of the work upon completion of the entire project.

3.03 CORRECTION OF WORK BEFORE/AFTER FINAL PAYMENT

A. Promptly remove from premises all work not accepted by the Owner as failing to conform to the Contract, whether incorporated or not. Promptly replace and re-execute work in accordance with the Contract and without expense to the Owner, and bear expense of making good all work that is destroyed or damaged by such removal or replacement.

B. If the Contractor does not remove work which has been rejected by the Owner within a reasonable time as fixed by written notice, the Owner may remove it and store materials at the expense of the Contractor. If the Contractor does not pay expenses of such removal within ten (10) days time thereafter, the Owner may, upon ten (10) days written notice, sell such materials at auction or at private sale and shall account for net proceeds thereof, after deducting all costs and expenses that should have been borne by the Contractor.

C. Neither final payment nor any provision in the Contract Documents shall relieve the Contractor of responsibility for faulty materials or workmanship and shall remedy
any defects due thereto and pay for any damage to other work resulting therefrom which shall appear within a period of one (1) year from the date of final acceptance by the owner. Where guarantees are required by the Contract Documents for longer periods, such longer periods shall apply. The Owner shall give notice of observed defects with reasonable promptness. All questions arising under this article shall be decided by the Owner.

3.04 RECORD DRAWINGS

Not used.

3.05 FINAL CLEAN-UP

A. Contractor shall remove and legally dispose of all construction debris resulting from construction operations from the site. Contractor shall restore and repair all surfaces soiled by construction operations.

B. Removal of Protection: Except as otherwise indicated or requested by Owner, remove temporary protection devices and facilities which were installed during course of the work to protect previously completed work during remainder of project construction periods and those devices and facilities installed to prevent erosion and sediment from leaving the site.

C. Contractor shall clean all equipment, piping, conduit runs, adjacent streets and other equipment requiring cleaning.

D. Contractor shall pay for all costs related to facility and equipment cleaning.

E. The requirements of refuse removal, cleaning and other related work as specified shall be completed prior to the Final Inspection and constitutes one condition of final acceptance.

3.06 CERTIFICATES OF INSPECTION REQUIRED FOR OCCUPANCY

Not used.

3.07 GUARANTEE

A. The Contractor and his sureties shall unconditionally guarantee all work to be performed and all materials to be furnished under the Contract against defects in materials or workmanship for a period of two (2) years from date of final acceptance by the Owner. If a longer guarantee period is specified, the longer guarantee period shall apply.

B. Where guarantees are required for work performed by subcontractors, secure guarantees from said subcontractors addressed to and in favor of the Owner.
C. Delivery of said guarantees shall not relieve the Contractor or his sureties from any obligation assumed under other provisions of the Contract Documents.

D. Should defects develop in any work within periods specified in the Contract Documents, due to faults in materials and/or workmanship, make repairs and do necessary work to correct defective work so that it fully complies with the Contract Documents, to the satisfaction of the Owner. Perform such repairs, corrective work, including replacing of other work damaged by or otherwise affected by making of repairs or corrective work, or which may have been damaged by defective work, without extra cost to the Owner, starting within ten (10) days after written notice to the Contractor by the Owner. Complete such repairs or corrective work as rapidly as possible.

E. In case the Contractor or his surety fail to do work so ordered, the Owner may have work done and charge the cost thereof against moneys retained, as provided for in the Contract Documents. If said moneys are insufficient to pay such cost, or if no money is available, the Contractor and his surety agree to pay to the Owner such an amount as will fully reimburse the Owner for such work.

F. Guarantees required by the Contract Documents shall be delivered in quadruplicate to the Owner before final voucher on the Contract is issued. The time of the guarantees shall begin the date of final acceptance, even though guarantees are delivered prior thereto.

END OF SECTION 01700
PART 1 - GENERAL

1.01 SCOPE

A. Work included:

Demolition, clearing and grubbing required for this Work includes, but is not necessarily limited to: removal of concrete, cutting, patching, etc.; site clearing; demolition and removal of miscellaneous items which are designated to be removed and/or are not necessary for the proper functioning of the new facilities, unless these items are designated to remain or so directed by the Engineer; removal of various items as is necessary for the proper performance of the Work; and removal of all debris.

B. Definitions:

The term "demolition, clearing and grubbing" as used herein includes the removal of all existing objects (except for those objects designated to remain) down to the existing ground level or removal of existing structures both above and below ground and disposal of same, plus such other Work as is indicated on the Drawings and/or required by these Specifications.

1.02 RESPONSIBILITY AND LIABILITY FOR INTERFERENCE WITH UTILITIES AND OTHER STRUCTURES

A. It is the responsibility of the Contractor to contact the Owners of the various utilities in this area prior to starting work on this Project, and also during construction, and to determine the exact location of any structures, gas or water mains, electric or telephone conduits, sewer lines, drainage facilities and all service lines the utilities may have at the site of the Work so that he may locate and protect them, whether or not such structures or utilities are shown on the Drawings.

B. The Contractor shall assume full responsibility and liability for all property damage and bodily injury that may result from his damaging or disturbing any structures, drainage facilities, water and gas mains, electric conduits, sewer lines, or other facilities of the utilities present at the site of the work.

C. The Contractor shall be responsible for all damages to utilities, structures, power lines, gas, water and drain lines, sewers, underground conduits, or other facilities that may result from his operations and shall restore same to their original condition as soon as possible.
1.03 PROPERTY RESTORATION

The Contractor shall be responsible for all damages to public and private properties, structures, fences, lawns, landscape plantings, sidewalks, or other surface features of the Owner's property or that of others that may result from his operations and shall restore same to their original condition as soon as possible and prior to completion of his Contract.

1.04 JOB CONDITIONS

A. The Contractor shall use all means necessary to prevent the spread of dust during performance of the Work of this Section and shall thoroughly moisten all surfaces as required to prevent dust from being a nuisance to the public, neighbors or concurrent performance of other Work on the site.

B. Burning:

On-site burning will not be permitted without advance approval of the Owner and the Engineer.

PART 2 - PRODUCTS

2.01 TEMPORARY BARRICADES

Unless otherwise specifically approved by the Owner, the Contractor shall use only new and solid lumber of utility grade or better to construct temporary barricades around open excavations, new construction work, around the objects designated to remain, or where otherwise required.

PART 3 - EXECUTION

3.01 PREPARATION

A. Electric power lines:

The Contractor is hereby notified that the proposed work may be in close proximity to overhead high voltage power lines. It is the Contractor's responsibility to take such precautions as are necessary or required and to inform his personnel and any Subcontractors of and enforce all safety rules, regulations and procedures as necessary or required to protect the workmen and the facilities or operations of the respective utilities when working near such power lines. The Contractor shall assume full responsibility and liability for all property damage and bodily injury that may result from his or his Subcontractor's personnel contacting directly or indirectly overhead high voltage electric lines.
B. Notification:

The Contractor shall notify the Owner at least two (2) full working days prior to commencing the work of this Section.

C. Site Inspection:

1. Prior to all Work of this Section, the Contractor shall carefully inspect the entire site and all objects designated to be removed or to be preserved.

2. The Contractor shall locate all existing utility lines and determine all requirements for disconnecting and capping.

3. The Contractor shall locate all existing active utility lines traversing the site and determine the requirements for their protection.

D. Clarification:

1. The Drawings do not purport to show all objects existing on the site.

2. Before commencing the Work of this Section, the Contractor shall verify with the Engineer all objects to be removed and all objects to be preserved.

E. Scheduling:

1. The Contractor shall schedule all Work in a careful manner with all necessary consideration for neighbors and the public.

2. The Contractor shall avoid interference with the use of, and passage to and from, adjacent buildings and facilities.

F. Protection of utilities:

The Contractor shall preserve in operating condition all active utilities traversing the site.

3.02 DEMOLITION OF STRUCTURES

A. The Contractor shall demolish and remove all sections of structures or complete structures designated for demolition or as required for the performance of the Work.

B. Care shall be exercised not to damage structures or facilities designated to be preserved or not specifically designated for demolition. Any such damage shall be promptly repaired by the Contractor to restore the damaged structures or facilities to a condition at least as good as existed prior to such damage.
3.03 SALVAGED MATERIALS

A. No materials salvaged from the demolition Work will be reused in this Project without the expressed permission of the Engineer.

B. All other materials salvaged from demolition work shall become the property of the Contractor (or owner if marked as such) and he shall dispose of them in a legal and responsible manner, off the site, as he sees fit. No on-site disposal of mechanical piping, equipment, etc., or sales will be permitted.

3.04 PROCEDURES

A. The Contractor shall comply with all applicable local, State and Federal safety regulations and shall furnish, install, erect and/or remove all fences, guard rails, enclosure chutes, catch platforms and shoring necessary for human safety and property protection. The Contractor shall be especially careful where Work being demolished is adjacent to Work, structures or facilities which are to remain.

B. The Contractor shall note that certain facilities which are to be abandoned in place following completion will require cleaning and sealing and shall perform such Work as may be required to accomplish this with regard to the Work Schedule, particularly as it relates to maintaining such facilities in service until new Work is completed and placed into service.

C. After demolition of substructure facilities, the Contractor shall fill any cavities and bring the grade to the elevations indicated on the Drawings, all in accordance with the requirements of these Specifications.

D. Any damage to structures or facilities which are to remain in use shall be the responsibility of the Contractor and he shall repair same to the satisfaction of the Engineer.

E. In clearing the Work site of trees, shrubs and surface vegetation, the Contractor shall observe care not to damage any structures, utilities, property or persons. Only those trees, shrubs, etc. which are absolutely required to be removed to permit construction activities to proceed shall be removed. The Contractor shall preserve as many existing trees and shrubs as possible and shall not remove any trees larger than 3 inches in diameter measured at one foot above the ground without the advance approval of the Engineer.

END OF SECTION 02100
SECTION 02230
SITE PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Design Drawings.

1.2 SECTION INCLUDES
   A. Furnish all labor, material and equipment to clear project construction area as needed.
   B. Work shall include (as applicable), but not be limited to, the following:
      1. Tree Removal
      2. Pavement, Curb, and Sidewalk Removal
      3. Miscellaneous Appurtenance Removal
      4. Top Soil Removal/Storage
      5. Salvage
      6. Disposal

1.3 NOT USED

1.4 NOT USED

1.5 REGULATORY REQUIREMENTS
   A. Conform to applicable Federal, State, and Local codes for disposal of debris. No burning on site will be permitted.
   B. Coordinate clearing Work with respective utility companies as applicable.

1.6 JOB CONDITIONS
   A. Dust Control: Use all means necessary to control dust on and near the Work and on and near all off-site borrow areas if such dust is caused by the Contractor's operations during performance of the Work or if resulting from the condition in which the Contractor leaves the site.
   B. Thoroughly moisten all surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other work on the site.
   C. No tracking of dirt, mud, or debris onto streets or state highways shall be allowed. Any such occurrence shall be cleaned immediately.
   D. Contractor shall verify locations of all underground utilities.

1.7 PROTECTION
   A. Protect utilities that remain from damage.
   B. Protect trees, plant growth, and features designated to remain as final landscaping.
C. Protect benchmarks and existing structures from damage or displacement.
D. Protect fences, guide rail, shrubbery, trees, signs and any other items removed and designated to be preserved for reuse.

PART 2 - PRODUCTS
A. Products shall be used as needed to perform Site Preparation activities. Products shall be approved by the Owner or Owner’s Representative.

PART 3 - EXECUTION

3.1 GENERAL
A. When working within temporary or permanent Rights-of-Way, use every means possible to protect from injury and damage all property, including trees, shrubbery, lawns, fences, buildings, walls, roads, water courses, natural features or any improvements thereto which may exist. Do not willfully or maliciously injure or destroy trees, shrubs, or vegetation, and do not remove or cut them without permission of the Owner or Owner’s Representative.
B. All operations must be confined to the width of the Rights-of-Way secured by the Authority from the Owner. All damage done to property resulting from the Contractor’s negligence shall be repaired without charge to the satisfaction of the Owner with the exception of those items (trees, shrubs, etc.) that must be removed for construction and have been agreed upon beforehand, in writing, with the Owner or Owner’s Representative.

3.2 VIDEO TAPING/PROGRESS PHOTOS
A. Based on the type and location of Rights-of-Way, the Owner may require video taping of site and, if so, will specify. Progress photos will be required by the Owner.

3.3 CLEARING
A. Clear areas required for access to site and execution of Work. Work includes removal of trees, shrubs, fences, foundations, structures, paving, debris, trash and other obstructions.
B. Limits of clearing shall be kept to a minimum and follow civil site plans.
C. No trees or vegetation shall be removed or altered within PennDOT’s Right-of-Way unless a separate specific permit is obtained.
D. No trees shall be removed within the construction zone or Rights-of-Way except the following:
   1. Trees within an excavated area such as footing or trench.
   2. Trees whose root system will be destroyed by the excavation.
   3. Trees that interfere with the movement of the Contractor’s equipment with the approval of the Owner or Owner’s Representative. Any trees that interfere with the movement of the Contractor’s equipment shall be reviewed by the Owner or Owner’s Representative before they are removed.
   4. All trees bordering any construction zone or Right-of-Way shall be protected by acceptable methods. Trees damaged by the Contractor will...
be either repaired or replaced as determined by the Owner or Owner’s Representative at the Contractor's expense.

E. Shrubbery within the areas to be cleared shall be removed and preserved for replanting (if indicated on plans).

F. All debris and organic material produced in clearing shall be removed from the work zone to preclude being used as backfill material.

G. Stripping Topsoil: Strip topsoil from within the limits of earthwork operations as specified. Topsoil shall be a fertile, friable, natural topsoil of loamy character. Topsoil shall be capable of growing healthy horticultural crops of grasses. Stockpile topsoil as indicated on Construction Drawings. To extent possible, eliminate foreign materials, such as weeds, roots, stones, subsoil, frozen clods, and similar foreign materials larger than ½ cubic foot in volume, from soil as it is stockpiled.

3.4 TRIMMING OF TREES
A. When required, with the Owner or Owner’s Representative’s approval, trees shall be trimmed to remove branches or roots that interfere with construction or traffic. Paint all cut branches and roots with wound paint as recommended for the application.

3.5 FENCES, GUIDE RAIL, SIGNS AND PARKING METERS
A. Contractor shall carefully remove and preserve for reinstallation all fences, guide rails, signs, mailboxes and parking meters which interfere with Work within the Rights-of-Way.

B. All items damaged during removal, and unsuitable for reuse shall be replaced by the Contractor at no expense to the Owner.

3.6 SALVAGE
A. Material, that is to be salvaged as a result of the clearing operations, shall include the following items, which are to be turned over to the property owner if the property owner so desires.
   1. Parts suitable for use as mulch.
   2. Live plants suitable for replanting.

B. All salvageable material not desired by the property owner shall be removed as part of the Work.

3.7 DISPOSAL
A. Burning of materials on the site will be controlled by local codes or ordinances.

B. Removal:
   1. Material to be removed shall be removed from the site as it accumulates.
C. Dumping:

1. Prior to depositing surplus material at any off-site location, the Contractor shall obtain a written agreement between himself and the Owner of the property on which the disposal is proposed. The agreement shall state that the Owner of the property gives permission for the Contractor to enter and deposit the material at no expense to the Owner. A copy of the agreement shall be furnished to the Owner or Owner’s Representative. Contractor’s disposal shall comply with all Federal, State, and Local laws and regulations. Disposal of surplus material within PennDOT’s Rights-of-Way is prohibited. All surplus material must be disposed of as the Work progresses and shall not be stored on PennDOT’s Rights-of-Ways for future removal.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Site preparation shall be paid as a lump sum line item as indicated on the Project Bid Sheet.

END OF SECTION
SECTION 02270

SOIL EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

A. Refer also to Soil and Erosion Sedimentation Control Plan as approved by the Washington County Conservation District Office, and all permits or related instructions, and the latest version of the Erosion and Sediment Pollution Control Program Manual published by the Commonwealth of Pennsylvania Department of Environmental Protection, Office of Resources Management, Bureau of Soil and Water Conservation, Division of Soil Resources and Erosion Control

1.1 Section Includes

A. Soil Erosion and Sedimentation Control

1.2 Submittals

A. Submit manufacturer's certifications of materials to the Engineer.

PART 2 - PRODUCTS

2.1 All materials shall meet the requirements of the latest edition of the Erosion and Sediment Pollution Control Program Manual published by the Commonwealth of Pennsylvania Department of Environmental Protection, Office of Resources Management, Bureau of Soil and Water Conservation, Division of Soil Resources and Erosion Control.

PART 3 - EXECUTION

3.1 Construct and maintain all measures required by the Soil Erosion and Sedimentation Control Plan attached to these Specifications and as indicated in the Plans. Remove all temporary measures after completed restorations have taken place to the acceptance of the owner.

END OF SECTION
SECTION 02300

EARTHWORK

PART I – GENERAL

1.1 SECTION INCLUDES

A. Protection, modification, or installation of utilities as site work progresses with particular attention to grade changes and necessary staging or phasing of work.

B. Cutting, filling, and grading to required lines, dimensions, contours, and elevations for proposed improvements.

C. Scarifying, compacting, drying, dewatering and removal of unsuitable material to ensure proper preparation of areas for fills or proposed improvements.

1.2 RELATED SECTIONS

A. Section 02230 - Site Preparation

B. Section 02310 – Earthwork for Utilities

C. Section 02486 – Finish Grading and Seeding

1.3 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM) latest edition

1. D422 Standard Test Method For Particle – Size Analysis of Soil

2. D 698 Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN.m/m3))

3. D 1557 Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 Kn.m/m3))

4. D 2216 Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures

5. D 2487 Classification of Soils for Engineering Purposes

6. D 2922 Density of Soil and Soil-Aggregate In Place by Nuclear Methods (Shallow Depth)

7. D 3017 Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

8. D 4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils
1.4 QUALITY ASSURANCE

A. An independent testing laboratory, selected and paid by Owner, may be retained to perform construction testing on site.

1. The independent testing laboratory shall prepare test reports that indicate test location, elevation data, and test results. Owner and/or Owner’s Representative and Contractor shall be provided with copies of reports within 96 hours of time that test was performed. In event that test performed fails to meet Specifications, the independent testing laboratory shall notify Owner and Contractor immediately.

2. Costs related to retesting due to failures shall be paid for by Contractor at no additional expense to Owner. Contractor shall provide free access to site for testing activities.

3. Quality assurance testing shall be in accordance with Part 3, Section 3.08, “Field Quality Control”.

1.5 SUBMITTALS

A. Submit 30-pound sample of each type of off-site fill material that is to be used at the site in airtight container(s) for the independent testing laboratory or submit gradation and certification of aggregate material that is to be used at the site to the independent testing laboratory for review.

B. Submit name of each material supplier and specific type and source of each material. Change in source throughout project requires approval of Owner.

C. If fabrics or geogrids are to be used, design shall be submitted for approval to Owner.

D. Submit Dewatering Plans upon request by Owner.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Excavated and re-used material for subsoil fill as specified herein. Fill material shall be free of topsoil, organic matter, slag, red-dog, pyritic/carbonaceous material, coal, and other deleterious material.
B. Aggregate fill as specified.

C. Imported fill material approved by the Owner and/or Owner’s Representative and specified herein.

D. Topsoil fill as specified.

E. Acceptable stabilization fabrics and geogrids as specified.

F. Filter and drainage fabrics as specified.

2.2 EQUIPMENT

A. Transport off-site materials to project using well-maintained and operating vehicles. Once on site, transporting vehicles shall stay on designated haul roads and shall at no time endanger improvements by rutting, overloading, or pumping.

2.3 SOURCE QUALITY CONTROL

A. In areas to receive pavement, California Bearing Ratio (CBR) or Limerock Bearing Ratio (LBR) test shall be performed for each type of material that is imported from off-site.

B. Following tests shall be performed as part of construction testing requirements on each type of on-site or imported soil material used as compacted fill:

1. Moisture and Density Relationship: ASTM D 698 (or ASTM D 1557)

2. Mechanical Analysis: AASHTO T 88 (or ASTM D422)

3. Plasticity Index: ASTM D 4318

PART 3 - EXECUTION

3.1 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Locate and identify existing utilities that are to remain and protect from damage.

C. Notify utility companies to remove or relocate public utilities that are in conflict with proposed improvements.

D. Protect plant life, lawns, fences, existing structures, sidewalks, paving, and curbs, unless otherwise noted on construction drawings from excavating equipment and vehicular traffic.

E. Protect benchmarks, property corners, and other survey monuments from damage or displacement. If marker needs to be removed it shall be referenced by licensed land surveyor and replaced, as necessary, by same.
F. Remove from site, material encountered in grading operations that, in opinion of the Owner and/or Owner’s Representative, is unsuitable or undesirable for backfilling, subgrade, or foundation purposes. Dispose of in manner satisfactory to Owner. Backfill areas with layers of suitable material and compact as specified herein.

G. Prior to placing fill in low areas, such as previously existing creeks, ponds, or lakes, perform following procedures:
   1. Drain water out by gravity with ditch having flow line lower than lowest elevation in low area. If drainage cannot be performed by gravity ditch, use adequate pump to obtain the same results.
   2. After drainage of low area is complete, remove mulch, mud, debris, and other unsuitable material by using acceptable equipment and methods that will keep natural soils underlying low area dry and undisturbed.
   3. All muck, mud, and other materials removed from low areas shall be dried on-site by spreading in thin layers for observation by the Owner and/or Owner’s Representative. Material shall be inspected and, if found to be suitable for use as fill material, shall be incorporated into lowest elevation of site filling operation, but not under building subgrade or within 10'-0" of perimeter of building subgrade or paving subgrade. If, after observation by the Owner and/or Owner’s Representative, material is found to be unsuitable, unsuitable material shall be removed from site.

H. Dewatering:
   1. General:
      a. Design and provide dewatering system using accepted and professional methods consistent with current industry practice to eliminate water entering the excavation under hydrostatic head from the bottom and/or sides. Design system to prevent differential hydrostatic head, which would result in floating out soil particles in a manner, termed as a “quick” or “boiling” condition. System shall not be dependent solely upon sumps and/or pumping water from within the excavation where differential head would result in a quick condition, which would continue to worsen the integrity of the excavation’s stability.
      b. Provide dewatering system of sufficient size and capacity to prevent ground and surface water flow into the excavation and to allow all Work to be installed in a dry condition.
      c. Control, by acceptable means, all water regardless of source and the Contractor is fully responsible for disposal of the water.
      d. Confine discharge piping and/or ditches to available easement or to additional easement obtained by Contractor. Provide necessary permits and/or additional easement at no additional cost to Owner.
e. Control groundwater in a manner that preserves strength of foundation soils, does not cause instability or raveling of excavation slopes, and does not result in damage to existing structures. Where necessary to these purposes, lower water level in advance of excavation, utilizing wells, wellpoints, jet educators, or similar positive methods. The water level as measured by piezometers shall be maintained a minimum of 3 feet below prevailing excavation level.

f. Commence dewatering prior to any appearance of water in excavation and continue until Work is complete to the extent that no damage results from hydrostatic pressure, flotation, or other causes.

g. Open pumping with sumps and ditches shall be allowed, provided it does not result in boils, loss of fines, softening of the ground, or instability of slopes.

h. Install wells and/or wellpoints, if required, with suitable screens and filters, so that continuous pumping of fines does not occur. Arrange discharge to facilitate collection of samples by the Owner. During normal pumping, and upon development of well(s), levels of fine sand or silt in the discharge water shall not exceed 5 ppm. Install sand tester on discharge of each pump during testing to verify that levels are not exceeded.

i. Control grading around excavations to prevent surface water from flowing into excavation areas.

j. No additional payment will be made for any supplemental measures to control seepage, groundwater, or artesian head.

2. Design:

a. Contractor shall designate and obtain the services of a qualified dewatering specialist to provide dewatering plan as may be necessary to complete the Work.

b. Contractor shall be responsible for the accuracy of the drawings, design data, and operational records required.

c. Contractor shall be solely responsible for the design, installation, operation, maintenance, and any failure of any component of the system.

3. Damages:

a. Contractor shall be responsible for and shall repair without cost to the Owner any damage to work in place, or other contractor’s equipment, utilities, residences, highways, roads, railroads, private and municipal well systems, adjacent structures, natural resources, habitat, existing wells, and the excavation. Including, damage to the bottom due to heave and including but not limited to, removal and pumping out of the excavated area that may result from Contractor’s negligence, inadequate or
improper design and operation of the dewatering system, and any mechanical or electrical failure of the dewatering system.

b. Remove subgrade materials rendered unsuitable by excessive wetting and replace with approved backfill material at no additional cost to the Owner.

4. Maintaining Excavation in Dewatering Condition:
   a. Dewatering shall be a continuous operation. Interruptions due to power outages, or any other reason will not be permitted.
   b. Continuously maintain excavation in a dry condition with positive dewatering methods during preparation of subgrade, installation of pipe, and construction of structures until the critical period of construction and/or backfill is completed to prevent damage of subgrade support, piping, structure, side slopes, or adjacent facilities from flotation or other hydrostatic pressure imbalance.
   c. Provide standby equipment on site, installed, wired, and available for immediate operation if required to maintain dewatering on a continuous basis in the event any part of the system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, perform such work as may be required to restore damaged structures and foundation soils at no additional cost to Owner.
   d. System maintenance shall include but not be limited to 24-hour supervision by personnel skilled in the operation, maintenance, and replacement of system components, and any other work required to maintain excavation in dewatered condition.

5. System Removal:
   a. Remove dewatering equipment from the site, including related temporary electrical service.
   b. Wells shall be removed or cut off a minimum of 3 feet below final ground surface, capped, and abandoned in accordance with regulations by agencies having jurisdiction.

3.2 EXCAVATION FOR FILLING AND GRADING

A. Classification of Excavation: By submitting bid, Contractor acknowledges that site has been investigated to determine type, quantity, quality, and character of excavation work to be performed. Excavation shall be considered unclassified excavation, except as otherwise indicated in the Contract Documents. Unclassified excavation shall include removal of all existing man-made and natural obstructions, soils and rock to proposed subgrade elevations, regardless of character of materials and obstructions encountered.
B. When performing grading operations during periods of wet weather, provide adequate dewatering, drainage and ground water management to control moisture of soils.

C. Shore, brace, and drain excavations as necessary to maintain excavation as safe, secure, and free of water at all times.

D. Rock or stone less than 24 inches in largest dimension when mixed with smaller diameter material to create a well-graded fill is acceptable as fill to within 10 feet of the surface of proposed subgrade.

E. Rock or stone with a maximum size of 8 inches in the largest dimension when mixed with smaller diameter material to create a well-graded fill is acceptable as fill within 10 feet of the surface of proposed subgrade.

3.3 FILLING AND SUBGRADE PREPARATION

A. Fill areas to contours and elevations shown on Construction Drawings with unfrozen materials. No topsoil or organic materials shall be used as fill material.

B. Place fills in continuous lifts specified herein.

C. Areas exposed by excavation or stripping and on which subgrade preparations are to be performed shall be scarified to minimum depth of 8-inches and compacted to minimum of 95 percent of maximum density, in accordance with ASTM D 698 (or 92 percent of maximum density, in accordance with ASTM D 1557) at moisture content of not less than 1 percent below and not more than 3 percent above optimum moisture content. These areas shall then be proofrolled to detect areas of insufficient compaction. Proofrolling shall be accomplished by making minimum of 2 complete passes with fully-loaded tandem-axle dump truck with a maximum weight of 20 tons, or approved equal, in each of 2 perpendicular directions while under the supervision and direction of the independent testing laboratory. Areas of failure shall be excavated and recompacted as specified herein.

D. Fill materials used in preparation of subgrade shall be placed in lifts or layers not to exceed 8-inches loose measure and compacted to 95 percent of maximum density, in accordance with ASTM D 698, (or 92 percent of the maximum density, in accordance with ASTM D 1557) at moisture content of not less than 1 percent below and not more than 3 percent above optimum moisture content.

3.4 MAINTENANCE OF SUBGRADE

A. Verify finished subgrades to ensure proper elevation and conditions for construction above subgrade.

B. Protect subgrade from excessive wheel loading during construction, including concrete trucks, dump trucks, and other construction equipment.

C. Remove areas of finished subgrade found to have insufficient compaction density to depth necessary and replace in manner that will comply with compaction
requirements by use of material equal to or better than best subgrade material on site. Surface of subgrade after compaction shall be hard, uniform, smooth, stable, and true to grade and cross-section.

3.5 BORROW AND SPOIL SITES

A. Contractor shall be responsible for compliance with NPDES and local erosion control permitting requirements for any and all on-site and off-site, disturbed spoil and borrow areas. Upon completion of spoil and/or borrow operations, clean up spoil and/or borrow areas in a neat and reasonable manner to the satisfaction of off-site property owner, if applicable, Owner and/or Owner’s Representative.

3.6 RIP-RAP

A. Place rip-rap in areas where indicated on Construction Drawings. Stone for rip-rap shall consist of field stone or rough unhewn quarry stone as nearly uniform in section as is practical. Stones shall be dense, resistant to action of air and water, and suitable for purpose intended.

B. Dress slopes and other areas to be protected to line and grade shown on Construction Drawings prior to placing of rip-rap. Undercut areas to receive rip-rap to elevation equal to final elevation less average diameter of stones before placing rip-rap.

C. Install filter fabric and bedding stone prior to placement of rip-rap if so indicated on Construction Drawings. Bedding stone shall be quarried and crushed angular limestone, 6-inches in depth in accordance with the details.

D. Place stones so that greater portion of weight is carried by earth and not by adjacent stones. Place stones in single layer with close joints. Upright areas of stone shall make angle of approximately 90 degree with embankment slope. Place courses from bottom of embankment upward, with larger stones being placed in lower courses. Fill open joints with spalls. Embed stones in embankment as necessary to present uniform top surface such that variation between tops of adjacent stones shall not exceed 3-inches.

3.7 FINISH GRADING

A. Grade areas where finish grade elevations or contours are indicated on Construction Drawings, other than paved areas and buildings, including excavated areas, filled and transition areas, and landscaped areas. Graded areas shall be uniform and smooth, free from rock, debris, or irregular surface changes. Finished subgrade surface shall not be more than 0.10-feet above or below established finished subgrade elevation. Ground surfaces shall vary uniformly between indicated elevations. Grade finished ditches to allow for proper drainage without ponding and in manner that will minimize erosion potential. For topsoil, sodding and seeding requirements refer to Section 02486.

B. Correct settled and eroded areas within 1 year after date of completion at no additional expense to Owner. Bring grades to proper elevation. Replant or
replace grass, shrubs, bushes, or other vegetation that appears dead, dying, or disturbed by construction activities.

3.8 FIELD QUALITY CONTROL

A. Field density tests for in-place materials may be performed at the expense of the OWNER as part of construction testing requirements in accordance with the following standard:

1. Nuclear Method: ASTM D 2922 (Method B-Direct Transmission)

B. Perform density test as follows:

1. Building Subgrade Areas, Including 10'-0" Outside of Exterior Building Lines: In cut areas, not less than 1 compaction test for every 5,000 sq. ft. In fill areas, same rate of testing for each 8-inch lift, measured loose.

2. Areas of Construction Exclusive of Building Subgrade Areas: In cut areas, not less than 1 compaction test for every 10,000 sq. ft. In fill areas, same rate of testing for each 8-inch lift, measured loose.

C. Corrective measures for non-complying compaction:

1. Remove and recompact deficient areas until proper compaction is obtained at no additional expense to Owner.

PART 4 – MEASUREMENT AND PAYMENT

4.1 Earthwork shall be paid as a Lump Sum item as indicated on the Project Bid Sheet.

END OF SECTION
PART 1 - GENERAL

1.0 RELATED DOCUMENTS

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

1.1 SECTION INCLUDES

A. Excavate trenches for sanitary and storm piping and structures and all utility installation and for appurtenances as required.

B. Compacted bedding under pipe.

C. Backfilling and compaction of sanitary sewers and force mains, laterals, manholes, and related appurtenances.

1.2 RELATED SECTIONS

A. Section 02631 – Storm Sewer System

B. Section 02530 – Sanitary Sewer Line and Forcemain

1.3 REFERENCES

A. Pennsylvania Department of Transportation Publication 408/Latest Edition

B. Pennsylvania Code, Title 67, Chapter 459, Occupancy of Highways by Utilities/Latest Edition


1.4 SUBMITTALS

A. Submit in accordance with contract

1.5 TRENCHING REGULATIONS

A. In open trenching or boring on State, County or Township roadways, the Contractor shall be governed by the conditions, restrictions, and regulations made by the Pennsylvania Department of Transportation and municipal authority. All such regulations shall be considered part, as if included plus the ones set down in these Specifications.

B. The Contractor shall be responsible at all times for carrying out all excavation operations in a safe and prudent manner to protect all workmen and the public from unreasonable hazard. The necessary sheeting and bracing should be determined in accordance with the field conditions encountered. All applicable OSHA requirements must be strictly adhered to.
C. All sheeting and/or shoring devices used in depths over 8 feet shall be
designed and certified by a Professional Engineer registered in the State of
Pennsylvania. Such certification shall be provided to the Owner and/or Owner’s
Representative prior to the use of such devices.

1.6 EXCAVATION
A. All trench excavation shall be unclassified.

1.7 BLASTING
A. No blasting shall be permitted.

1.8 TRAFFIC MAINTENANCE
A. The Contractor shall be required to submit to the Owner and/or Owner’s
Representative for review and approval his maintenance and traffic control plan
prior to beginning construction (if applicable). The plan shall be based upon the
latest publication of the PennDOT Publication 203.
B. The Contractor shall furnish the necessary guards, watchmen, warning lights
and similar items necessary to maintain state highway and other road/street
traffic in accordance with PennDOT requirements. In general, the Contractor
will not be permitted to interrupt traffic without specific arrangements for
detouring traffic in accordance with PennDOT requirements. When traffic
cannot be detoured, a minimum of 1/2 the roadway width shall be open at all
times with traffic control.

1.9 WORK DURING INCLEMENT WEATHER
A. The Owner and/or Owner’s Representative reserves the right to order cessation
of work during inclement weather, if, in the opinion of the Owner and/or Owner’s
Representative, the safety of the workman is endangered or if the work itself is
endangered.

1.10 ACCESS AND INSPECTION
A. All work in this section is subject to inspection by the Owner and/or Owner’s
Representative and shall have full access to the project for same.

PART 2 - PRODUCTS

2.1 BACKFILL MATERIALS
A. #2A Coarse aggregated per PENNDOT PUB. 408, Section 703
B. AASHTO #10 or 1-B Crushed aggregated per PENNDOT PUB 408, Section
703.
C. AASHTO #57 Coarse aggregate
D. Suitable excavated material free of debris, organic material, and rock larger
than four (4) inches.
E. Other as specified by utility company.
2.2 CONCRETE BACKFILL
   A. Concrete shall meet the requirements of Section 02515 – Site Concrete for Class B.

PART 3 - EXECUTION

3.1 EXAMINATION
   A. The Contractor’s attention is directed to his responsibilities in accordance with PA Act 287. Any underground utilities shown on construction drawings should be verified prior to beginning construction.
   B. Maintain and protect existing utilities remaining which pass through work area.
   C. Before starting any earthwork activity under this Section, the Contractor shall insure that all Erosion and Sedimentation Controls are in place.
   D. Verify backfill materials to be used are acceptable.
   E. Verify that survey benchmarks and intended elevations for Work are as shown on the Drawings.

3.2 PREPARATION
   A. Identify required lines, levels, contours, and datum.
   B. Protect plant life, lawns, and other features remaining as a portion of final landscaping.
   C. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs from excavation equipment and vehicular traffic.
   D. In the event of damage, immediately make all repairs and replacements as required by the Owner and/or Owner’s Representative at no additional cost to the Owner.

3.3 EXCAVATION
   A. Where trenching occurs through bituminous or concrete pavement, the edge(s) shall first be cut through full depth to preclude distortion of remaining edge(s) during excavation.
   B. Excavate subsoil required for utility installation and appurtenances. Allow for bedding/support depth as indicated on the drawings. Use laser to maintain grade specified for sanitary sewers.
   C. Cut trenches sufficiently wide to enable installation of utilities and allow inspection.
   D. Excavation shall not interfere with normal forty-five (45) degree bearing splay of foundations.
   E. Correct unauthorized excavation at no cost to Owner.
   F. Unforeseen conditions encountered, such as sinkholes, shall be stabilized at a negotiated price.
   G. Correct areas over-excavated by error by backfilling with PENNDOT #2A STONE, satisfactorily compacted.
H. The Contractor shall dewater all trenches to provide a dry trench bottom for the installation of the sewer pipe. Trench water shall be discharged by pumps or by other means to natural drainage channels, storm drains, or other points upon written approval of the Owner and/or Owner’s Representative and in compliance with regulations of the SCS, and DEP. Where pumping is required, the Contractor shall provide sufficient pump capacity to maintain the trench bottom in a dry condition.

I. Remove excess material not being used to an approved on-site waste area or dispose of legally at Contractor's expense.

3.4 BEDDING
A. Bedding shall be placed in accordance with design drawings. Hand work material around pipe haunches and pipe to preclude misalignment and grade changes. Pipe that is damaged or moved out of alignment shall be re-laid by the Contractor at his expense.

3.5 BACKFILLING
A. Backfill trenches to contours and elevations with unfrozen materials of the SPECIFIED type.
B. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.
C. Employ a placement method that does not disturb or damage pipe in trench.
D. Place and compact backfill materials in continuous layers not exceeding 8 inches in compacted depth using standard compaction equipment. No Hydra-Hammers shall be used until two (2) feet over top of pipe is reached.
E. ALL roads and PENNDOT shoulders - #2A Coarse Aggregate
F. Refer to material specifications.
G. Maintain optimum moisture content of backfill materials to attain required compaction density.
H. Remove surplus backfill materials from site.
I. Replace and patch trenches with same depth asphalt as found existing at site of excavation.

3.6 CONCRETE BACKFILL
A. In locations where the excavations have been carried beneath existing structures, utilities, or pipes, such that the backfill cannot be compacted in accordance with the requirements of Paragraph 3.5, the Contractor shall furnish and place concrete backfill to support such existing structures, utilities or pipes. Concrete shall be Class B.
B. Where the volume of concrete backfill required exceeds two (2) cubic yards, boulder fragments of rock excavated during construction may be embedded in the concrete to provide added bulk. Concrete backfill shall be vibrated as necessary to assure the structural support of the existing structure, utility, or pipe.
3.7  TOLERANCES
   A. Top Surface of Backfilling: Under paved area, plus or minus one-half (1/2) inch from required elevation for aggregate base.
   B. Top Surface of General Backfilling: Plus or minus one (1) inch from required elevations.

3.8  FIELD QUALITY CONTROL
   A. Backfill shall be compacted until non-movement under compaction equipment is observed.
   B. The use of HYDRA-HAMMER for compacting backfill in trenches is prohibited until 2 feet over top of pipe is completed by other equipment.
   C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

3.9  PROTECTION OF FINISHED WORK
   A. Protect finished Work under provisions of general conditions.
   B. Re-compact fills subjected to vehicular traffic.

PART 4 - MEASUREMENT AND PAYMENT
4.1  Earthwork for utility installation shall not be paid as a separate line item and shall be included in the unit cost line items for utility installation as indicated on the Project Bid Sheet.

END OF SECTION
SECTION 02486
FINISH GRADING AND SEEDING

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Preparation of subgrade to receive seeding.
B. Provide additional finish grade material as required or needed.
C. Seed bed preparation; seeding, fertilizing and mulching (hydroseeding).
D. Lawn establishment and maintenance until acceptance.
E. Cutting, filling, and grading to required lines, dimensions, contours, and elevations for proposed improvements.
F. Scarifying, compacting, drying, dewatering and removal of unsuitable material to ensure proper preparation of areas for road sub-base.

1.2 NOT USED

1.3 DEFINITIONS

A. Finish Grade: Surface elevation or top of planting soil.
B. Subgrade: Surface or elevation of subsoil remaining immediately beneath planting soil or top of pavement subbase.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer whose work has resulted in successful lawn establishment.
   1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.
B. Soil-Testing Laboratory Qualifications: An independent 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. Provide seed mixture in containers showing percentage of seed mix, producer's tests for purity and germination of seed, dated within nine months of sewing, net weight, date of packaging and locations of packaging.
D. Seed shall be blue tag certified, free of undesirable grass seed, and free of noxious weeds.
1.5 SUBMITTALS

A. Product Certificates: For soil amendments and fertilizers, signed by product manufacturer.

B. Qualification Data: For landscape installer.

C. 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. Certification of each seed mix for lawn identifying source, including name and telephone number of supplier.

D. Seed mixture and application quantities and procedures.

E. Fertilizer and mulch information showing analysis of mixture.

1.6 REGULATORY REQUIREMENTS

A. Comply with regulatory agencies for fertilizer.

B. Provide certificate of compliance from authority having jurisdiction indicating approval of seed mixture.

1. Comply with Commonwealth of Pennsylvania Department of Transportation standard specifications.

C. All seed and seed labels shall be in accordance with State and Federal laws, rules and regulations including Article 9, Section 137 of the Agricultural and Markets Law.

1.7 PRODUCT DELIVERY, HANDLING AND STORAGE

A. Delivery:

1. Do not deliver materials to job site until Project is ready for their immediate application.

2. Seed and fertilizer which has become damaged in transit or outdated will not be accepted and MUST be removed from site immediately.

1.8 JOB CONDITIONS

A. Existing Conditions:

1. Perform finish grading and seeding ONLY after preceding work affecting ground surface is completed.
B. Environmental Requirements:
   1. DO NOT plant seed on frozen soil.
   2. DO NOT perform seeding operations when wind exceeds 5 MPH.

C. Protection:
   1. Restrict foot and vehicular traffic from seeded areas after seeding to end of maintenance period.

1.9 SCHEDULING

A. Planting Restrictions: Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

B. Seeding operations shall be performed in a timely fashion when the Contractor feels it is the appropriate time, because it is their responsibility to provide a healthy, weed free stand of grass.

C. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit. Do not perform seeding operations when wind velocity exceeds 5 mph.

PART 2 - PRODUCTS

2.1 SEED MIXTURE

A. Grass Seed: Fresh, clean, dry, new-crop seed.

B. Seed Species: State-certified seed of grass species, as follows:

   i. Lawn Seed Mixture. (Penn DOT Formula B). Seed at a rate of 4 to 5 lbs. per 1000 sf.

<table>
<thead>
<tr>
<th>Grass</th>
<th>% By Weight</th>
<th>% Purity</th>
<th>% Germination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kentucky Bluegrass Mixture*</td>
<td>50</td>
<td>98</td>
<td>80</td>
</tr>
<tr>
<td>Perennial Ryegrass Mixture**</td>
<td>20</td>
<td>98</td>
<td>90</td>
</tr>
<tr>
<td>Creeping Red Fescue or Spreading Fescue</td>
<td>30</td>
<td>98</td>
<td>85</td>
</tr>
</tbody>
</table>

*A combination of improved certified varieties with no one variety exceeding 25% of the bluegrass component.

**A combination of improved certified varieties with no one variety exceeding 50% of the total.
ii. Commercial lawn mix seed at a rate of 3 to 5 lbs. per 1000 sf.

<table>
<thead>
<tr>
<th>Commercial Lawn Mix</th>
<th>% By Weight</th>
<th>% Purity</th>
<th>% Germination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tall Type Tall Fescue</td>
<td>50</td>
<td>95</td>
<td>80</td>
</tr>
<tr>
<td>Creeping Red Fescue</td>
<td>25</td>
<td>98</td>
<td>85</td>
</tr>
<tr>
<td>Annual Ryegrass</td>
<td>25</td>
<td>98</td>
<td>95</td>
</tr>
</tbody>
</table>

2.2 FERTILIZER

A. Bonemeal: Commercial, raw or steamed, finely ground; percent of nitrogen and percent of phosphoric acid. Per soil test results.

B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

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

1. Commercial Composition: 10 percent nitrogen, 20 percent phosphorous, and 20 percent potassium, by weight, and urea form 38 percent nitrogen.

2. Composition: Nitrogen, phosphorous, and potassium in amounts needed for the type of planting soil utilized

2.3 MULCHES

A. Straw mulch: Provide air-dry, clean, mildew-weed and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley free of foreign matter detrimental to plant life.

B. Fiber Mulch: Biodegradable, dyed wood, cellulose-fiber mulch; non-toxic; free of plant growth or germination inhibitors; with maximum moisture content of 14 percent +/- 3%, PH range of 4.5 to 6.5, ash content 1.4 percent +/- 0.2 percent, and a 1,000 percent minimum water holding capacity.

C. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant growth or germination inhibitors. Use natural gum blended with jelling and hardening agents (Terra Tack AR) as manufactured by Grass Growers Company or approved equal.
D. Other mulch binders as approved by the local County Conservation District and PA Department of Environmental Protection (PADEP).

2.4 WATER
A. Free of substances harmful to plant growth, suitable for drinking.

2.5 TOPSOIL
A. Having a pH of between 6.0 and 7.0, containing not less than 2% nor more than 10% organic matter as determined by AASHTO T194.
B. Fertile friable loam, sand loam, or clay loam which will hold a ball when squeezed with the hand, but which will crumble shortly after being released.
C. Free of clods, grass, roots, or other debris harmful to plant growth.
D. Free of pests, pest larvae, matter toxic to plans, and weeds.
E. Topsoil removed during site preparation activities may be reincorporated into this work. Additional topsoil, as required, shall be furnished by the Contractor at no additional cost to the Owner.

PART 3 - EXECUTION

3.1 INSPECTION
A. Examine areas to receive finish grading and preparation for seeding to assure work of other trades has been completed.
B. Examine areas to receive finish paving and preparation for road installation to assure work of other trades has been completed.
B. Check that preceding work affecting subgrade surface has been completed.
C. Ensure that soil is not frozen and within allowable range of moisture content.

3.2 PREPARATION
A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs and plantings from damages caused by seeding operations.
   1. Protect adjacent and adjoining areas from hydroleasing 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 TOPSOIL PLACEMENT

A. In all lawn and planting areas, fracture the subsoil: Loosen subgrade to a minimum depth of twelve inches (12”). Remove all stones measuring over 3 inches (3”) in any dimension. Remove all sticks, roots, rubbish and other extraneous matter.

B. Spread topsoil to a minimum of 6 inches (3” at a time)) in depth so that the surface meets all lines, grades and elevations shown after light rolling and natural settlement.

C. Place approximately one half of total amount of topsoil required. Work into top of loosened subgrade to create a transition layer and then place remainder of topsoil.

D. Prepare one area at a time so that once an area has been loosened and topsoil incorporated, it is not compacted again by heavy equipment.

E. Fine grade lawn areas to smooth, even surface with loose, uniformly fine texture. Roll, rake and drag lawn areas, remove ridges and fill depressions as necessary to finish grades.

F. In planters: Place topsoil in lightly compacted layers to the depth required, allowing for natural settlement.

G. Coordinate all final grading and placement of topsoil with installation of plant materials.

3.4 HYDROSEEDING

A. Equipment shall have a built in agitation system and operating capacity sufficient to agitate, suspend and homogeneously mix a slurry containing not less than 44 pounds of organic mulching amendment plus fertilizer, chemical additives and solids for each 100 gallons of water.

B. Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with non-asphaltic tackifier (application rate of 70 lbs/acre).

2. Mix slurry with fertilizer (Best 6-20-20 or Best 15-15-15) or approved equal applied at rate appropriate for the product.

3. Apply slurry uniformly to all areas to be seeded in a two-step process. Apply first slurry application at a minimum rate of 500 pounds/acre dry weight but not less than the rate required to obtain specified seed-sowing rate. Apply slurry cover coat of fiber mulch at a rate of 1000 pounds/acre.

C. Water all areas to be hydroseeded thoroughly to saturate the soil prior to the hydroseeding operation.
D. Allow the planting area soil surface to dry out for one day only prior to the hydroseeding application. Exercise care not to allow the soil surface to be overly saturated with water prior to the hydroseeding installation. At the same time the soil surface should not become too dry during this period. There should be some residual moisture within the first ¼” of the soil surface.

E. Apply the hydroseeding in the form of a slurry consisting of organic soil amendments, commercial fertilizer, and any other chemicals that are called out or required. When hydraulically sprayed onto the soil, the mulch shall form a blotter-like material. Direct the spray operation so that this procedure will drill and mix the slurry components into the soil, the slurry spray will also penetrate the soil surface, thus ensuring maximum impregnation and coverage. The impregnation and mixing of the components will help in retaining moisture while stabilizing soil surface from superficial erosion.

F. Do not let the hydroseeding slurry components in the hydroseeding machine for more than two (2) hours because of possible seed destruction. If slurry components are left for more than two hours in the machine, add 50% more of the originally specified seed mix to any slurry mixture which has not been applied within the two hours after mixing. Add 75% more of the original seed mix to any slurry mixture which has not been applied eight (8) hours after mixing. All mixtures more than eight (8) hours old must be disposed, off-site, at the contractor’s expense.

G. Spray the area with a uniform visible coat, using the dark color of the cellulose fiber as a visual guide. The slurry shall be applied in a downward drilling motion via a fan stream nozzle. Insure that all of the slurry components enter and mix with the soil. Insure the uniformity of the hydroseed application.

F. Contractor shall save all seed and fertilizer tags and fiber mulch bags for the Owner or Owner’s Representative to verify compliance with the drawings and specifications.

3.5 PROTECTION

A. Immediately after seeding, erect barricades and warning signs to protect seeding areas from traffic until grass is established.

3.6 LAWN ESTABLISHMENT AND MAINTENANCE

A. Begin maintenance immediately after each area is planted and continue until acceptable vegetation is established.

B. Maintain and establish vegetation by watering, fertilizing, weeding, mowing, trimming, replanting and other landscaping operations. Roll, regrade, and replant bare or eroded areas and remulch as needed.

1. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch. Anchor as required to prevent displacement.
2. If any portion of the seeded surface becomes gullied or otherwise damaged following seeding, the affected areas shall be re-graded and reseeded as specified herein.

C. Watering: Provide water to vegetated areas to establish acceptable vegetative growth.

D. Reseed, fertilize and mulch areas larger than one square foot not having a uniform stand of grass.

E. Reworking and reseeding of any areas that fail to show a uniform stand of grass shall be done at the Contractor’s expense with the same mixture applied at the rate originally used and repeated until all areas are covered with a satisfactory stand of grass.

F. Establishment and maintenance period shall extend until a uniform lawn is established and “Final Acceptance”.

3.7 INSPECTION REQUIREMENTS

A. The following list of minimal compliance standards are to be inspected and brought into compliance by the Contractor during construction. Discovery and correction of non-complying work is the responsibility of the Contractor. The Contractor shall identify and correct all non-complying items prior to requesting the processing of the Certificate of Substantial Completion.

B. Complying lawns and grasses work shall be capable of withstanding dead and live loads under normal use.

C. Non-complying work includes but is not limited to the following:
   1. Dead grass
   2. Sparse grass (can see soil beneath 3-inch high mown grass)
   3. Erosion gullies with grass missing
   4. Planting soil not rolled prior to seeding

3.8 CLEAN-UP

A. Remove all trash, debris and excess materials from project site.

B. Maintain all paved areas in a clean condition.

C. Remove all barriers and signs from site at the termination of the maintenance period.
3.9 INSPECTION AND ACCEPTANCE

A. The Owner or Owner’s Representative shall inspect the Finish Grading and Seeding work upon written request by the Contractor.

B. Upon acceptance of the Finish Grading and Seeding work, the Contractor shall be relieved of further responsibility for care and maintenance of the accepted area.

END OF SECTION
SECTION 02555

EXCAVATION AND BACKFILL FOR PIPELINE UTILITIES
AND APPURtenANCES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Excavation and backfill, classification, trench excavation including saw cutting of existing pavement, explosives and blasting, accommodation of traffic, accommodation of drainage, pumping, embankment, backfilling trenches, restoration, temporary paving and restoration of paved traveled areas, protection of property and structures, obstruction shown on drawings, removal of obstructions, and clean up.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 EXCAVATION AND BACKFILL – GENERAL

A. The Contractor shall excavate, protect and backfill all foundations, trenches, and other excavations that may be necessary for completing the work to be done under the Contract. All excavation shall be in open cuts, except where and to such extent as the Engineer may authorize or direct that same be done by boring or jacking, or where such is specified in the Special Requirements or Contract Plans. Trenches may be, in general, excavated and backfilled either by machinery, or by hand as the Contractor may elect; provided however, that the Engineer is empowered wherever he shall decide that such necessity exists, to direct that hand excavation be employed. The Contractor shall have no claim for extra compensation due to the fact that hand, instead of machine, excavation may be necessary from any cause whatever.

B. The Contractor shall perform all excavation of every description and of whatever substances encountered, to the lines and grades or depths indicated by the Drawings, as specified herein, or as directed by the Engineer. Embankments shall be prepared in accordance with the Specifications, and as necessary to bring the ground surface to finished grade elevations for areas as shown on the Drawings or directed by the Engineer. All excavated material not required for backfill or embankment shall be removed and wasted or otherwise disposed of as directed or specified.

3.2 CLASSIFICATION

A. All trench excavation as required by the Contract Drawings and Specifications,
shall be considered as unclassified excavation, with no additional payment being made in the event rock, quicksand, muck or other unsuitable material is encountered in the construction of such work.

3.3 TRENCH EXCAVATION

A. The Engineer shall have the right to limit the amount of trench opened in advance of backfilling. Generally a length of 100 feet of open trench will be permitted.

B. In case more material is excavated from any trench than can be backfilled over the completed pipe or can be stored on the street or within the limits of the right-of-way, leaving space for the traffic and drainage as herein provided, the excess material shall be removed to a site mutually agreeable to the Owner and Contractor. The Contractor is responsible for providing this site. The Contractor shall at his own cost and expense, bring back as much of the material removed as may be required to properly backfill the trench. If not of the proper kind or if so directed by the Engineer, the Contractor shall, at his own cost and expense, furnish such other suitable material as may be necessary.

C. All removal and protection of pavement will be done in accordance with Pennsylvania Code Title 67. Transportation dated July 1989. In case the Contractor removes or disturbs any pavement on account of settlement, slides, blasting, or cave-ins, the Contractor is required to replace all such pavement removed or disturbed without additional compensation. Pavement shall be saw cut prior to excavation, and the edges of the pavement shall be protected and maintained by the Contractor until the repaving is completed.

D. For excavation in paved areas, the backhoe out-rigger pads shall be equipped with rubber blocks to protect the pavement areas. When utilizing the loader bucket for stabilization, it shall also be blocked.

3.4 EXPLOSIVES AND BLASTING

A. The Engineer shall be empowered to regulate the character and strength of any explosives used, and the manner of their use and storage. Only small amounts of any explosives shall be kept at any place and they shall be kept under lock, the key to be only in the hands of a trustworthy person. Great care shall be taken in handling dynamite and similar explosives during freezing weather. Caps and exploders shall not be kept in the same place as explosives. Blasts shall be properly matted and securely covered.

B. The Contractor shall be solely responsible for injury to persons or property that may result from his use of explosives, and the exercise of, or failure to exercise control on the part of the Engineer shall in no way relieve him of responsibility for injury or damage resulting from their use.

C. If allowed, the blasting work shall be performed by a licensed and competent blasting contractor, having current acceptable insurance coverages in amounts satisfactory to the Engineer.
3.5 ACCOMMODATION OF TRAFFIC

A. Streets shall not be unnecessarily obstructed and unless the Engineer, in writing, shall authorize the complete closing of the street, the Contractor shall take such measures at his own expense, as may be necessary to keep the street or road open and safe for traffic.

B. The Contractor shall employ traffic control measures in accordance with Pennsylvania Department of Transportation Publication 213., Work Zone Traffic Control.

C. The Contractor shall construct and maintain, without extra compensation, such adequate and proper bridges over excavations as may be necessary or as directed for the safe accommodation of pedestrians or vehicles. The Contractor shall furnish and erect without cost to the Owner, substantial barricades at crossings of trenches, or along the trench, to protect the traveling public.

D. The Contractor shall not obstruct fire hydrants.

E. The roadway on one side of the line of work shall be kept open at all times.

F. The streets, crosswalks, and sidewalks shall be kept clean, clear and free for the passage of vehicles or pedestrians, unless otherwise authorized in writing by the Engineer. A straight and continuous passageway on sidewalks and over crosswalks, at least three feet in width, shall be preserved free from all obstructions.

G. Where deemed necessary, such additional passageway as may be directed shall be maintained free of obstructions.

H. In narrow or congested streets or alleys, when so directed, the Contractor shall complete his work up to a point designated by the Engineer before opening the work ahead, in order to give access to garages and other places. The Contractor shall in all cases so arrange his work as to cause the least inconvenience to property owners consistent with the proper prosecution of the work as determined by the Engineer.

3.6 ACCOMMODATION OF DRAINAGE

A. Gutters, sewers, drains and ditches shall be kept open at all items for surface drainage. No damming or ponding of water in gutters or other waterways will be permitted, except where stream crossings are necessary and then only to an extent which the Engineer shall consider necessary. The Contractor shall not direct any flow or water across or over pavements except through approved pipes or properly constructed troughs; and he shall, when so required and at his own cost and expense, provide pipes or troughs of such sizes and lengths as may be required and place the same as directed. The grading in the vicinity of pipe trenches shall be controlled so that the ground surface is properly pitched to
prevent water running into the trenches.

3.7 PUMPING

A. The Contractor shall keep all excavations free from water, at his own expense, while installation work is in progress, and to such extent as may be necessary while excavation work alone is being carried on. The Contractor shall build all dams and other devices necessary for this purpose, including lowering the water table below trench bottom by well points and pumping, and provide and operate pumps of sufficient capacity for dewatering the excavations. He shall provide for the disposal of the water removed from excavations in such manner as shall not cause injury to the public health, to public or private property, to the work of other contractors, to any portion of the work completed or in progress, or produce any impediment to the use of the highways, roads, lanes and streets by the public.

3.8 EMBANKMENT

A. Where embankment is necessary to support the foundations of or cover the pipe, it shall be made to the height, width and slopes shown on the Plans or as directed. The entire embankment or such portion thereof as may be deemed necessary by the Engineer, shall be made prior to the construction of the pipe or the foundation thereof at such time and in such order as the Engineer may direct.

B. The material for embankment shall be deposited in layers of not more than eight inches in thickness; each layer shall be separately compacted by heavy pavers' rammers. No breaks or irregularities in the distribution of the material or the formation of the layers will be allowed. The whole embankment shall be carried up evenly to the height given by the Engineer in such a manner as to make a compact and solid foundation. When pipe is to be laid in a fill, the embankment shall be brought to a height at least one foot above the proposed top of the pipe before the trench is excavated. The embankment shall then be excavated to the proper form and grade and the pipe placed thereon; after which the embankment shall be carried up to a height of not less than three feet above the top of the pipe, the material being placed and rolled or rammed in layers as above described.

C. In case the embankment over the pipe should obstruct any natural drainage, the Contractor will be required to do any work and furnish any material necessary to preserve natural drainage, to the satisfaction of the Engineer.

3.9 BACKFILLING TRENCHES

A. After the pipeline and its appurtenances have been constructed, all trenches shall be backfilled with the material indicated in the Trench Details included in the Construction Plans to a height six inches (6) above the top of the pipe and solidly rammed down and tamped around the pipe under it, with mechanical tampers and proper tools made for this purpose. The remainder of the trench shall be backfilled to the required height in layers not exceeding eight (8) inches in thickness. Mechanical tampers shall be used do as to obtain maximum compaction of the material.
B. Compaction of all trenches along and across State Road travelways and shoulders shall be in accordance with Pennsylvania Code Title 67, Transportation dated July 1989.

C. All backfilled surfaces shall be maintained flush with the adjacent undisturbed surfaces.

D. As the trenches are filled in and the work completed, the Contractor shall, at his own cost and expense, remove and dispose of all surplus earth, stone, slag, or other material from the work, in such manner and at such point or points as he may select or provide, subject to the approval of the Engineer; or he may deposit the same, either with or without rehandling, at any point or points on the lines of the work covered by the Contract, if so directed by the Engineer; and shall leave all roads, sidewalks and other places free, clear and in good order. In case the Contractor shall fail or neglect to do so, or to make satisfactory progress in doing so, within 24 hours after the receipt of a written notice from the Engineer, the Owner may remove such surplus material and clear the roadways, sidewalks and other places, and the cost of said work shall be charged to the Contractor and deducted from any moneys due or to become due him under the Contract.

3.10 RESTORATION

A. Upon completion of all compacted backfilling of non-topsoil excavation, the top soil previously removed and stored shall be replaced and mounded over the backfilled area. Immediately upon backfilling of the trench for the entire length over each individual property, the entire disturbed area of this property shall be cleaned of all debris, graded and fine-raked. Thereafter, all shrubbery, hedges, trees, fences, walkways, etc., shall be replaced to a condition of equal to that before construction. Reseeding of the backfilled area within the reasonable limits of the construction is required. However, the careful replacement of the soil, the prompt cleanup and raking of the construction area on each property, the complete replacement of all removed surface items and the continued maintenance of the top surface of the trench shall be strictly enforced. In the event that the trench surface compacts in some places lower than the original grade, these areas shall be refilled with top soil, whether or not available on the property upon which the depression occurs. The Contractor shall be required to periodically inspect all mounded areas of backfill and repair and maintain these areas as necessary until no further compaction results. Reseeding and mulching must be done within twenty (20) days of backfilling, weather permitting. Hydro-seeding methods are acceptable.

3.11 TEMPORARY PAVING AND RESTORATION OF PAVED TRAVELED AREAS

A. In all paved areas other than State Highways and in all unpaved areas used as thoroughfares, road shoulders, driveways or parking areas, the Contractor shall provide over all backfilled excavations a temporary paving consisting of a layer of crushed stone. Contractor shall maintain these temporary crossings, without additional compensation, until permanent pavement is placed. No additional compensation will be allowed for this layer of crushed stone or for any excavation.
required to place permanent pavement.

B. The Contractor, at his option, may elect to provide the permanent replacement of any bituminous paving immediately after backfilling is completed. In such cases, the requirements for temporary crushed stone are waived.

C. Temporary restoration of a pavement or paved shoulder may be required by the Engineer prior to permanent restoration, under the following:

   (1) The base shall consist of compacted select granular material with a surface of 2-inch bituminous material. If the existing pavement structure includes a course of subbase material, it shall be replaced to a depth equal to the existing course depth with material meeting the requirements of Section 350.2 of Publication 408.

   (2) Temporary pavement restoration shall be completed before traffic is allowed to travel on the disturbed area. The temporary pavement may be kept in place for up to 6 months or as specified in the Pennsylvania Department of Transportation Highway Occupancy Permit (if applicable), if it is properly maintained.

   (3) The temporary pavement shall be removed and permanent restoration performed.

Paint Identification. Upon completion of pavement or paved shoulder restoration, the restoration date shall be painted immediately adjacent to the restored cut but not in an area where tires normally contact the pavement. The painted date shall indicate the month and year numerically. The numerals shall be 6 to 9 inches in height. The paint shall be color coded as follows: blue (water), yellow (gas-petroleum), red (electric), orange (communications), and green (sewer). The paint shall be maintained for 2 years after the acknowledged completion of the permitted work. If the pavement or shoulder is being overlaid for more than 100 linear feet, the PennDOT District Office may, upon request, exempt the permittee from complying with this subsection.

Appurtenances to Underground Installations. Requirements relating to appurtenances to underground installations shall include:

   (1) The top of every manhole, valve box or other access to the facility shall be at the same elevation as the surface in which it is located.

   (2) The surface surrounding manhole covers located in paved shoulders shall be paved with 4 inches bituminous concrete base course a distance of at least 1 foot around the structure to prevent washouts.
(3) A manhole, including those cast-in-place, shall be constructed in compliance with current industry standards and Section 713.2(c) of PennDOT Publication 408.

D. The Contractor shall be responsible for any injury or damage resulting from lack of required trench maintenance during the prescribed maintenance period.

3.12 RESPONSIBILITY FOR CONDITION OF EXCAVATION

A. The Contractor shall be responsible for the condition of all excavations made by him. All slides and cave-ins shall be removed without extra compensation, at whatever circumstances they may occur.

B. The neglect, failure, or refusal of the Engineer to order the use of bracing or sheeting, or a better quality, grade or section, or larger sizes of steel or timber, or to order sheeting, bracing, struts, or shoring to be left in place or the giving or failing to give orders or directions as to the manner or method of placing or driving sheeting, bracing, jacks, wales, rangers, etc., shall not in any way or to any extent relieve the Contractor of any responsibility concerning the condition of excavation or of any of his obligations under the contract; nor shall any delay, whether caused by any action or want of action on the part of the Contractor, or by any act of the Owner, or his agents, or employees, resulting in the keeping of an excavation open longer than would otherwise have been necessary, relieve the Contractor from the necessity of properly and adequately protecting the excavation from caving or slipping, nor from any of his obligations under the Contract relating to injury of persons or property, nor entitle him to any claim for extra compensation.

3.13 PROTECTION OF PROPERTY AND STRUCTURES

A. The Contractor shall, at his own expense, sustain in their places, and protect from direct or in-direct injury, all pipes, tracks, walls, buildings, and other structures or property in the vicinity of his work, whether above or below the ground, or that may appear in the trench. He shall at all times have a sufficient quantity of timber and plank, chains, ropes, etc., on the ground and shall use them as necessary for sheeting his excavations and for sustaining or supporting any structures that are uncovered, undermined, endangered, threatened, or weakened.

B. The Contractor shall take all risks attending the presence or proximity of pipes, poles, tracks, walls, building and other structures and property, of every kind and description, in or over his trenches, or in the vicinity of his work, whether above or below the surface of the ground; and he shall be responsible for all damages and assume all expense for direct or indirect injury, caused by his work to any of them, or to any person or property by reason of injury to them, whether such structures are or are not shown on the Drawings.

C. The Engineer reserves the right under such conditions to stop the excavation or any other part of the work, and to require the Contractor to complete the pipeline and the backfilling up to such a point as the Engineer may direct before
proceeding further with the excavation, and the Contractor shall not thereby become entitled to demand or to receive any allowance or compensation, other than an extension of the Contract Time for as many days the Engineer may determine that the work was delayed by such stoppage.

3.14 OBSTRUCTIONS SHOWN ON DRAWINGS

A. Certain information regarding the reputed presence, size, character, and location of existing underground structures has been shown on the Contract Drawings. There is no certainty of the accuracy of this information, and it shall be considered by the Contractor in this light. The location of underground structures shown may be inaccurate and other obstructions than those shown may be encountered. The Contractor hereby distinctly agrees that the Owner is not responsible for the correctness or sufficiency of the information given, or on account of the insufficiency or absence of information regarding obstructions either revealed or not revealed by the Drawings; and that he shall have no claim for relief from any obligation or responsibility under the Contract, in case the location, size, or character or any pipe or other underground structure is not indicated on the Drawings, or in case any pipe or other underground structure is encountered that is not shown on the Drawings.

3.15 REMOVAL OF OBSTRUCTIONS

A. Should the position of any pipe, conduit, pole, or other structures, above or below the ground be such as, in the opinion of the Engineer, to require its removal or realignment, changes will be done as extra work, or will be done by the Owner of the obstructions, without cost to the Contractor. But the Contractor shall uncover and sustain the structures at his own expense before such removal and before and after such change as constituting part of the Contract; and the Contractor shall not be entitled to any claim for damage or extra compensation on account of the presence of said structure, or on account of any delay in the removal or rearrangement of the same.

B. The Contractor shall not interfere with any persons, firms, or corporations, or with the Owner in protecting, removing, changing, or replacing their pipes, conduits, poles, or other structures; but he shall suffer said persons, firms, corporations, or the Owner, to take all such measures as they may deem necessary or advisable for the purpose aforesaid, and the Contractor shall thereby be in no way relieved of any of his responsibilities under the Contract.

C. At railway or railroad track crossings, any expense to which the owner of the trackage is put, in shoring up tracks, or in maintaining traffic shall be borne by the Contractor whether the same is billed directly to him, or the Owner. Should any such bill be unpaid by the Contractor, before final payment under the Contract is made, the Owner shall be empowered to pay said bill and retain the amount thereof, from any moneys due, or to become due the Contractor.

D. Except for trees in the direct line of construction which have not been specifically designated to be left standing, the Contractor shall not cut down or destroy any
other trees unless specifically authorized to do so by the Engineer; and the Contractor shall have no claim for extra compensation owing to the fact that he may be required to excavate by hand or tunnel in the vicinity of trees required to be left standing, or remove, preserve and restore a tree, or replace a damaged or destroyed tree.

3.16 SITE WORK AND CLEANUP

A. It shall be the responsibility of the Contractor to keep the site neat and clean as the work progresses. Prior to final acceptance, the structure, machinery, and appurtenant materials, as well as the site on which the pipeline is located, shall be thoroughly cleaned and made pleasing in appearance. Should the Contractor fail to keep clean-up current, the Engineer is authorized to shut down all parts of the job until clean-up is current.

END OF SECTION
SECTION 02580

BITUMINOUS PAVING

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, material and equipment to restore all areas disturbed or damaged by the construction work and install on-site bituminous asphalt pavement. These areas shall include, but are not limited to:

1) Concrete Paved Areas
2) Bituminous Paved Areas
3) Shoulders
4) Sidewalks
5) Gravel Driveways
6) Curb/Curb Gutter

1.2 RELATED SECTIONS

A. Section 02515 - Site Concrete

1.3 REFERENCES

A. Pennsylvania Department of Transportation Publication 408/Latest Edition
B. Pennsylvania Code, Title 67, Chapter 459, Occupancy of Highways by Utilities/Latest Edition
C. Pennsylvania Department of Transportation Publication 72, Standards for Roadway Construction, Series RC-0 to 100, Latest Edition

1.4 SUBMITTALS

A. Submit Mix Designs and sources of supply of all materials used under this Section. Submit in accordance with Contract.

1.5 JOB CONDITIONS

A. Materials and Installation: These items involving bituminous and concrete paving shall be the same for PennDOT, Township, Borough, and private areas.
B. **Qualifications of Workmen:** Provide at least one person who shall be thoroughly trained and experienced in the skills required, who shall be completely familiar with the design and application of work described for this Section, and who shall be present at all times during progress of the work of this Section and shall direct all work performed under this Section.

1) For actual finishing of asphalt and concrete surfaces and operations of the required equipment, use only personnel who are thoroughly trained and experienced in the skills required.

C. **Dust Control:** Use all means necessary to control dust on and near the Work and on and near all off-site borrow areas if such dust is caused by the Contractor’s operations during performance of the Work or is a result of the condition in which the Contractor leaves the site. Thoroughly moisten all surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other Work on the site.

D. **Protection:** Use all means necessary to protect the materials of this Section before, during, and after installation and to protect the Work and materials of all trades.

E. **Replacements:** In the event of damage, immediately make all repairs and replacements necessary to the approval of the Construction Manager and at no additional cost to the Owner.

F. **Protection of Utilities:** Protect existing facilities.

G. **Testing:** The Contractor is advised that the Owner reserves the right to retain the services of a testing Laboratory to check the densities of subgrade and bituminous material. In addition, cores may be taken to verify the thickness of the paving material. All testing costs will be charged to the Contractor.

### 1.6 TRAFFIC MAINTENANCE

A. The Contractor shall furnish the necessary guards, watchmen, warning lights and similar items necessary to maintain state highway and other road/street traffic in accordance with PennDOT requirements. In general, the Contractor will not be permitted to interrupt traffic without specific arrangements for detouring traffic in accordance with PennDOT requirements. When traffic cannot be detoured, a minimum of 1/2 the roadway width shall be open at all times with traffic control.

### PART 2 – PRODUCTS

#### 2.1 AGGREGATE BASE COURSE FOR PAVED AREAS

A. Provide aggregate base complying with the applicable PennDOT Specifications, Publication 408, Section 350 - Subbase.
2.2 ASPHALTIC MATERIALS

A. Mix Design: Provide asphaltic concrete consisting of a mixture of sand, mineral aggregate, and liquid asphalt mixed in such proportions that they meet applicable State Department of Transportation Publication 408 Specifications Superpave Asphalt Mixture Design.

2.3 CEMENT CONCRETE FOR RESTORATION

A. Cement concrete shall meet the specifications of Section 03300, Cast-In-Place Concrete.

1) Paving - Class AA or Class H.E.S.
2) Plain Cement Concrete Curb Gutter - Class AA
3) Plain Cement Concrete Curb - Class A
4) Cement Concrete Sidewalk - Class A

2.4 GRAVEL DRIVEWAYS AND SHOULDERS

A. Gravel Driveways - Granular material meeting the specifications of Publication 408, Section 703.

B. Stabilized Shoulders - Paragraph 2.04A.

C. Paved Shoulders, Type III

1) Aggregate Base - PennDOT #2A
2) Bituminous Prime Coat - MC-30, MC-70
3) Bituminous Surface Treatment
   a) E2 Emulsified Asphalt
   b) AASHTO No. 8 and No. 67 Coarse Aggregates

2.5 OTHER MATERIALS

A. All other materials, not specifically described but required for proper and complete installation of the Work of this Section, shall be selected by the Contractor subject to the approval of the Construction Manager.

PART 3 – EXECUTION

3.1 GENERAL

A. Inspect all areas requiring work under this Section to ensure readiness to receive restoration.
B. Permanent bituminous paving can only be done between April 1 and October 31 unless otherwise permitted in writing by the Construction Manager and/or PADOT (within PADOT right-of-way).

3.2 RAISING MANHOLE COVERS AND VALVE BOXES
A) Install the adjusting rings in all sewer and storm manholes that require adjusting to meet the elevation of the repaving.

1) Manholes within actual new construction shall meet finished elevation without adjusting rings.

B. Coordinate the raising of all valve boxes and/or manhole covers belonging to other utilities.

C. Where adjustments require the resetting of manhole covers, the mortar shall consist of Portland cement and silica sand. After material has set, paint with approved bitumastic coating.

D. Contractor shall be responsible to see that all such items as mentioned above are adjusted to the new paving elevation.

3.3 CONCRETE PAVING/PATCHING
A. Perform all work for this activity as specified in PennDOT Publication 408, Section 501 -Reinforced or Plain Cement Concrete Pavement and RC Standards No. 21 and No. 26.

3.4 SUBGRADE AND AGGREGATE BASE PREPARATION – PENNDOT / TOWNSHIP / BOROUGH /PRIVATE
A. In preparation for permanent repaving, the temporary paving shall be removed.

B. Prior to the replacement of the aggregate base course, the edges of the existing bituminous base and surface must be sawed a minimum of one (1) foot back from each side of the actual trench width.

C. Remove all material within the trench and "cut back" area to subgrade ready for the base course.

D. The subgrade for all repaved areas shall be thoroughly compacted to the proper distance below and parallel with the prescribed level of the base course. The subgrade shall be completely compacted in an approved manner prior to placing the aggregate base course. The subbase depth shall be as shown on the Drawings and State or Municipality Standards.

3.5 BITUMINOUS PAVING - PENNDOT/TOWNSHIP/BOROUGH/PRIVATE
A. Place bituminous materials in accordance with PennDOT Publication 408, Specifications:
1) Bituminous Concrete Base Course - Section 305
2) Bituminous Binder Course - Section 421
3) Bituminous Wearing Course - Section 420

3.6 EQUIPMENT

A. Compacting Equipment: Shall be self-propelled tandem rollers having a minimum weight of ten (10) tons, except that hand-held vibrator compactors may be used in areas not accessible to rollers when specifically approved by the Construction Manager.

B. Paving Equipment: Shall be spreading, self-propelled asphalt paving machines capable of maintaining line, grade, and the minimum surface thickness specified, except that spreader boxes may be used in areas where specifically approved by the Construction Manager.

3.7 PLACEMENT OF ASPHALTIC CONCRETE (SPECIFICS)

A. Placement: After completion of the aggregate base course, place base and wearing courses of types and thickness as shown on the Drawings.

B. Tack coat all vertical joints between existing and new paving with E-1, E-6, or E-8 bituminous material.

C. Receipt of Materials: Do not accept material unless it is covered with tarpaulins until unloaded, when the temperature is more than 15_F below the minimum temperature shown on the bituminous material suppliers Bill of Lading and when exceeding the maximum specified temperature.

D. Do not place asphaltic concrete until the atmosphere and surface temperatures are 35 F (and rising) for base course and 40 F (and rising) for wearing; nor during fog, rain, or other unsuitable conditions.

E. Spreading: Spread material in a manner which requires the least handling. Where thickness of finished pavement will be three (3) inches or less, spread in one (1) layer.

F. Rolling: After the material has been spread, roll with the specified equipment until the surface is hard, smooth, unyielding, and true to the thickness and elevations shown on the Drawings.

G. Roll the surface in at least two (2) directions until no roller marks are visible.

H. Finished surfaces shall be smooth, free from birdbaths, and shall be free of irregularities.
3.8 OVERLAY

A. Where a surface course is required over existing roads, the surfaces to be covered shall be cleaned of all foreign substances and any irregularities removed or filled in. A tack coat shall be applied in accordance with Section 460, of the PennDOT Publication 408, after which the surface course will be applied.

B. Where the overlay meets the existing paving a neat cut shall be made in the existing surface in accordance with the construction details as shown on Standard RC-28 or as directed by the Construction Manager.

C. Contractor shall be responsible to see that all such items as mentioned in Section 3.08 A and B are adjusted to the new manhole elevation in such a manner as to provide a smooth, even transition from pavement to manhole cover.

3.9 FINISH TOLERANCES

A. Finish all surfaces to the following tolerances:

1) **Base Course**: Plus or minus 0.04’ from line and grade shown on the Drawings.

2) **Wearing Course**: Plus or minus 0.02’ at any point from line and grade shown on the Drawings.

B. Core Testing (when required).

3.10 SEALING

A. All joints between the new paving and the existing paving and where the new paving abuts other materials such as curbs, manhole frames, and inlets shall be sealed with PennDOT asphalt cement AC-20. Width shall be twelve (12) inches for pavement joints and where curb acts as a gutter. Others shall be six (6) inches.

3.11 MAINTENANCE

A. The Contractor shall maintain the final pavement for a period of two (2) years following the date of acceptance of project. In general, depressions in the final pavement in excess of one half inch below the normal road grade shall be corrected. Corrections in the pavement shall be made within fifteen (15) days after the Contractor has been notified of the need for corrective action. In the event of the failure or refusal of the Contractor to make such corrections, the Owner reserves the right to have the necessary work performed and to charge the cost to the Contractor under the Maintenance Bond.
3.12 BITUMINOUS DRIVEWAYS AND SIDEWALKS

A. The materials and construction practices shall be as specified in Sub-Sections - Parts 2 and 3.

B. Aggregate base shall be as specified on the drawings.

C. Bituminous may shall be minimum two (2) inch depth for both or "in-kind" where existing is greater.

D. Lighter, smaller compaction equipment may be used in these operations.

3.13 BITUMINOUS CURB

A. The material and construction of bituminous curb replacement shall be in accordance with PennDOT Publication 408 - Section 636.

3.14 CEMENT CONCRETE CURB/CURB GUTTER/SIDEWALKS

A. General

1) Remove minimal lengths for restoration, normally, to a scoring or joint.

B. Grade areas to allow respective depths of aggregate base in kind with minimum being four (4) inches.

C. Place one-half (1/2) inch expansion material between new and old concrete and other existing rigid structures.

D. Place required class of concrete to the same cross-section as existing. Refer to PennDOT Standard RC-64 for sizing where original cross-section is indefinite.

   1) Driveways shall be minimum six (6) inches thick.

   2) Sidewalks shall be minimum four (4) inches thick.

E. Surfaces shall be given a light broom finish with all edges tooled.

F. Curing may be with wet burlap or liquid membrane.

G. Contraction joints may be tooled or saw-cut. Twenty (20) feet maximum for curb/curb gutter and five (5) feet for sidewalk.

H. Mold four (4) test cylinders for each days placement. When day's placement is over fifty (50) cubic yards, mold four (4) test cylinders for each fifty (50) cubic yards or part thereof.
3.15 GRAVEL DRIVEWAYS AND STABILIZED SHOULDERS

A. Place six (6) inches of granular material meeting the requirements of Sub-Section 2.04A.

B. Grade shoulders to a minimum of one-half (1/2) inch per foot, or existing slope and properly compact.
   
   1) If the length of the facility exceeds fifty (50) feet, the shoulder shall be graded, rolled, and penetrated with RT-2C or MC-30 bituminous material at a minimum rate of .25 gallon per square yard and chipped or lightly sanded to prevent tracking of oil onto the pavement.

3.16 PAVED SHOULDERS, TYPE 3

A. This work is construction of shoulders on a prepared surface and consists of the following:

   1) Place PennDOT No. 2A material to the depths of bituminous base and wearing courses allowing one-half (1/2) inch for depth of surface treatment after compaction.

   2) Apply prime coat of MC-30 on MC-70 bituminous material at the rate of .20 to .50 gallon per square yard and allow to cure twenty-four (24) hours. Protect surface during this period.

   3) Apply E-2 bituminous material at the rate of .25 to .50 gallon per square yard. Then spread 25 to 45 pounds of AASHTO No. 67 course aggregate and roll thoroughly to set aggregate.

   4) After first application has cured, apply E-2 at a rate of .25 to .50 gallons per square yard. Then spread 15 to 30 pounds of AASHTO No. 8 coarse aggregate and roll thoroughly to set aggregate.

   5) Use pneumatic-tire and steel wheel tandem rollers (non-vibratory) for rolling. Do minimal backrolling.

   6) Protect from traffic until areas have cured.

B. For this Work in PennDOT Rights-of-Way, adhere to PennDOT Publication 408, Section 653 and Highway Occupancy Permit.

END OF SECTION 02580
SECTION 02590
MAINTENANCE AND PROTECTION OF TRAFFIC

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. This work is the maintenance and protection of traffic adjacent to and within the construction/work area.

1.2 RELATED SECTIONS

A. Not Used.

1.3 REFERENCES

A. Pennsylvania Department of Transportation (PADOT):

1. Publication 408 – Specifications
2. Publication 35 – Approved Construction Materials (Bulletin 15)
4. Publication 213 – Work Zoned Traffic Control

1.4 SUBMITTALS

A. Submit a traffic control plan to the Owner for work along:

   Local:
   Amwell Township: Craft Road (T-626)

   Private:
   Hupp Lane

1.5 NOTIFICATION

A. Notify the residences, private companies and the Impacted Areas at least 10 days before the placement of traffic control devices. Inform the Owners of proposed work and schedule. Temporary Message Boards will be provided a minimum of 15 days prior to installation of other traffic control devices.

PART 2 – PRODUCTS

2.1 MATERIALS
A. As specified in Section 901.2 of PADOT Publication 408.

PART 3 – EXECUTION

3.1 GENERAL

A. Comply with PADOT Publication 213.

B. Install and maintain traffic control devices. Use nonmetallic drums only. Reflectorize drums as indicated in PADOT Publication 213, except use minimum 6-inch to maximum 8-inch wide circumferential stripes, or use white drums to support vertical panels as indicated in PADOT Publication 213. Provide safety for the general public and the work crew, and protection of the work.

C. Schedule construction/work operations to permit movement of traffic as indicated for various phases of construction with minimum interference. If traffic interruptions become too frequent, cease operations in the area concerned, as directed. Take satisfactory remedial action to correct the situation before continuing operations.

D. Open any substantially completed section of roadway for the use and convenience of traffic, as directed, and as specified in Section 107.15, PADOT Publication 408. When work is completed, immediately remove work zone traffic control devices.

3.2 MAINTENANCE OF ROADWAY AND/OR STRUCTURES

A. Treat existing earth roads or improved roads that have been graded with calcium chloride or by other approved dust control measures as specified or directed.

3.3 DETOURS

A. For indicated detours, furnish, erect, maintain, and remove the detour signs, unless otherwise specified. Also, temporarily cover, revise, or remove existing permanent guide signs, in the vicinity of the construction site and along the detour route, if the messages on the guide signs conflict with the detour signs. Erect, maintain, and remove the detour signs and the modification of directional signs, as indicated, and as required for construction conditions. Restore original signs to their original state upon removal of the detour.

3.4 LOCAL TRAFFIC MAINTENANCE AND SAFETY

A. Proceed with the work to ensure safety and the least inconvenience to local traffic. Maintain local traffic ingress and egress by use of existing or new roadways.

B. Provide and maintain local access to and from the nearest intersection of public roads or street, unless otherwise directed. Provide temporary approaches for local vehicular and pedestrian access to and from commuter service, residential, business, industrial and other public and private facilities.
C. Provide and maintain adequate bridging over base and surface courses, trenches, or other construction.

3.5 EQUIPMENT AND MATERIAL STORAGE
A. Comply with PADOT Publication 213.

3.6 TUBULAR MARKERS
A. When specified or indicated, furnish and install tubular markers in accordance with PADOT Publication 213.
B. When directed or as required, replace the complete tubular marker or the tubular marker post only, as the case may be.
C. When directed or as required, replace the reflective band on the tubular marker.
D. Remove tubular markers when no longer required for traffic control or as directed.

3.7 EXISTING SIGNS
A. Remove existing warning, regulatory, guide and directional signs as required to accommodate construction operations. Do not remove Stop or Yield signs unless an alternate type of traffic control is provided, such as flaggers, temporary traffic signal, etc. Continue the alternate traffic control until the Stop and/or Yield signs are replaced. Stake or mark sign locations or locate signs on construction drawings before removing any signs. Reinstall existing warning signs at appropriate locations within 4 hours of their removal. With the exception of Stop or Yield signs as herein noted, reinstall existing regulatory, guide and directional signs at appropriate locations within 24 hours of their removal.

3.8 BARRICADES
A. Furnish and install barricades in accordance with PADOT Publication 213; except, all barricades to have a minimum of 270 square inches of reflective area facing traffic.

3.9 DROPOFFS
A. General. The following conditions and treatments apply only to dropoffs created by construction, maintenance, or permit/utility operations:
   1. Drainage ditches are not to be considered as dropoffs.
   2. When channelizing devices are used for a dropoff condition, a minimum of 2 devices are required.
   3. If a dropoff is greater than 6 inches and the distance from the dropoff to the edge of the travel lane is such that channelizing devices must be
placed below grade, position the devices on a stable platform so that the bottoms are at grade.

4. Temporary concrete median barrier may be required at the discretion of the Owner.

B. Dropoffs Between Travel Lanes. If a dropoff less than or equal to 2 inches exists between travel lanes, channelizing devices are not required. If a dropoff greater than 2 inches exists between travel lanes, provide the following as required:

1. On two-way, two-lane roadways, install “Do Not Pass” signs (R4-1) in each direction, at intervals not exceeding ½-mile, throughout the dropoff condition and install two-direction no passing zone, standard pavement markings in accordance with Figure 3, PADOT Publication 203.

C. Dropoffs Between the Edge of the Travel Lane and the Shoulder. If a dropoff less than or equal to 2 inches exists between the edge of the travel lane and the shoulder, channelizing devices are not required. If a dropoff greater than 2 inches exists, install channelizing devices throughout the dropoff condition. Install “Low Shoulder” signs (W8-11), at intervals not exceeding ½-mile, throughout the dropoff condition to supplement the channelizing devices.

D. Dropoffs In or Beyond the Shoulder. If a dropoff less than or equal to 2 inches exists in or beyond the shoulder area, channelizing devices are not required. If a dropoff greater than 2 inches exists in or beyond the shoulder area, install channelizing devices throughout the dropoff condition, unless the dropoff is:

1. Outside the right-of-way, or

2. Behind guide rail, or

3. Behind curb, or

4. 15 feet or more from the edge of roadway.

E. Spacing of Channelizing Devices for Dropoffs. Space channelizing devices at 2 times the normal speed limit in feet or closer, as directed.

END OF SECTION
SECTION 02602

SUBGRADE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Subgrade

1.02 QUALITY ASSURANCE

A. An Independent Testing Laboratory (ITL), secured by the Contractor for the Owner, will be retained to perform construction testing on site.

1. The independent testing laboratory shall prepare test reports that indicate test location and test results. Owner, Engineer, and Contractor shall be provided with copies of reports within 96 hours of time that test was performed. In event that test performed fails to meet Specifications, the independent testing laboratory shall notify Owner, Engineer, and Contractor immediately.

2. Costs related to retesting due to failures shall be paid for by the Contractor at no additional expense to Owner. Contractor shall provide free access to site for testing activities.

3. Quality assurance testing will be conducted in accordance with “Field Testing” in Part 3 hereinafter.

PART 2 - PRODUCTS

Not Included.

PART 3 - EXECUTION

3.01 SUBGRADE

A. Subgrade shall be constructed in accordance with PennDOT Publication 408, Section 210 "Subgrade."

3.02 FIELD TESTING

A. Nuclear Compaction field tests for in-place materials will be performed by the Owner’s Independent Testing Laboratory (ITL) in accordance with the requirements specified in PennDOT Form 408, latest edition and as required by the Engineer.

END OF SECTION
SECTION 02604

SUBBASE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Subbase

1.2 QUALITY ASSURANCE

A. An Independent Testing Laboratory (ITL), secured by the Contractor for the Owner, will be retained to perform construction testing on site.

1. The independent testing laboratory shall prepare test reports that indicate test location and test results. Owner, Engineer, and Contractor shall be provided with copies of reports within 96 hours of time that test was performed. In event that test performed fails to meet Specifications, the independent testing laboratory shall notify Owner, Engineer, and Contractor immediately.

2. Costs related to retesting due to failures shall be paid for by the Contractor at no additional expense to Owner. Contractor shall provide free access to site for testing activities.

3. Quality assurance testing will be conducted in accordance with “Field Testing” in Part 3 hereinafter.

PART 2 - PRODUCTS

2.1 SUBBASE

A. Subbase shall conform to the latest edition of the Pennsylvania Department of Transportation Publication 408 Specifications (PennDOT Publication 408), Section 350 "Subbase."

PART 3 - EXECUTION

3.1 SUBBASE

A. Subbase shall be constructed in accordance with PennDOT Publication 408, Section 350 "Subbase."

3.2 FIELD TESTING

A. Nuclear Compaction field tests for in-place materials will be performed by the Owner's Independent Testing Laboratory (ITL) in accordance with the requirements specified in PennDOT Form 408, latest edition and as required by the Engineer.

END OF SECTION
SECTION 02620
CONCRETE CURB, GUTTER, SIDEWALK, AND DRIVEWAY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete Curb
B. Concrete Mountable Curb
C. Concrete Gutter
D. Concrete Curb Gutter
E. Standard Concrete Sidewalk
F. Structural Concrete Sidewalk
G. Curb Cut Ramp
H. Standard Integral Concrete Curb and Sidewalk
I. Structural Integral Concrete Curb and Sidewalk
J. Unsuitable Material Overexcavation and Backfill with PennDOT No. 2A Stone
K. Concrete Driveway

1.02 RELATED SECTION(S)

A. Commonwealth of Pennsylvania, Department of Transportation, Publication 408 Specifications, current edition with all supplements (PennDOT Publication 408).
1.03 REFERENCE(S)


B. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

C. ASTM A615 - Deformed and Plain Billet Steel for Concrete Reinforcement.

D. ASTM A36 - Structural Steel

1.04 APPLICABLE STANDARD DRAWINGS

A. PennDOT Roadway Construction Standards RC-64 "Curb and Gutters", RC-65 "Concrete Mountable Curbs", and RC-67 "Curb Cut Ramps" included in the attachments to this Section.

1.05 SUBMITTALS

A. Certificates

Submit certification from material suppliers attesting that the following materials (where applicable) meet or exceed specification requirements:

1. Concrete
2. Concrete Curing Compound
3. Welded Wire Fabric
4. Reinforcing Steel
5. Permanent Metal Deck Forms
6. Structural Steel
7. Crushed Stone

1.06 INSPECTION AND TESTING LABORATORY SERVICES

A. Three concrete test cylinders shall be prepared by the Contractor under the
supervision of the Engineer for every 20 or less cubic yards of each class of concrete placed each day. The cylinders shall be cured on site under the same conditions as the concrete it represents. Contractor shall pay for all required compression tests of the cylinders.

B. One test for air entrainment and one slump test made by the Contractor under the Engineer's supervision for every 20 or less cubic yards of each class of concrete placed each day.

PART 2 PRODUCTS

2.01 CONCRETE

A. PennDOT Publication 408 Section 704 Class A.

2.02 MORTAR

A. For minor patching of concrete surfaces. Mix one part cement, two parts fine aggregate, and enough water to provide a consistency stiff enough to place by either manual or mechanical tamping. Do not use more than 4 1/2 gallons of water per bag of cement. Mix for 1 minute, cover to prevent loss of moisture, and allow to stand for 45 minutes. Remix for 1 minute without further addition of water, then place within 30 minutes after completion of mixing. Use material as follows:

1. Cement, Type IP, IS, or II - PennDOT Publication 408, Section 701
2. Fine Aggregate, Type A or C - PennDOT Publication 408, Section 703.1
3. Water - Clear and Drinkable

2.03 CONCRETE CURING COMPOUND

A. Water: Clean and drinkable.

B. Liquid Membrane Forming Curing Compound: AASHTO-M148, Type 1-D, Clear or Translucent

2.04 WELDED WIRE FABRIC

A. Plain Type, ANSI/ASTM A185, galvanized finish.

2.05 REINFORCING STEEL

A. ASTM A615, 60 KSI Yield Grade Billet Steel Deformed Bars; uncoated finish.
PART 3 EXECUTION

3.01 WORK WITHIN RIGHT-OF-WAY

The Contractor shall confine all work and storage to the rights-of-way provided.

3.02 MAINTENANCE AND PROTECTION OF VEHICULAR AND PEDESTRIAN TRAFFIC

The roadway shall be kept open at all times and the streets, crosswalks, sidewalks, and driveways shall be kept clean, clear and free for the passage of vehicles or pedestrians, unless otherwise authorized in writing by the Engineer. The Contractor shall in all cases so arrange his work as to cause the least inconvenience to property owners consistent with the proper prosecution of the work as determined by the Engineer.

The Contractor shall construct and maintain, without extra compensation, such adequate and proper bridges over excavations as may be necessary or as directed for the safe accommodation of pedestrians or vehicles. The Contractor shall furnish and erect, without cost to the Owner, substantial barricades at crossing of excavations, or along the excavation to protect the traveling public.

The Contractor shall make all disturbed pavement passable prior to the cessation of construction activity each working day. Excavations shall be repaired with a six (6) inch
topping of PennDOT No. 2A stone, and dust inhibitor such as calcium chloride. The Contractor shall maintain the pavement until it is permanently repaired.

3.03 SUBGRADE PREPARATION

The existing ground surface shall be excavated to the limits and depths indicated in the Plans or as directed by the Engineer to remove all unsuitable material. The subgrade shall be brought to required line, grade and cross section and thoroughly compacted, as determined by the Engineer, using approved ditch rollers or mechanical vibrators.

This operation shall include any reshaping and wetting required along with the rolling or tamping of the subgrade, to obtain proper compaction. All boulders of ledge stone encountered in the excavation shall be removed or broken off to a depth of not less than six (6) inches below the subgrade. The resulting area and all other low sections, holes, or depressions shall be brought to the required grade with material approved by the Engineer, and the entire subgrade shaped to line grade and cross section and thoroughly compacted.

3.04 UNSUITABLE MATERIAL OVEREXCAVATION AND BACKFILL WITH PENNDOT NO. 2A STONE

If the bottom of the excavation (proposed subgrade elevation) is found to be of unsuitable material including ashes, cinders, refuse, vegetable or other organic material or large pieces of inorganic material that in the judgment of the Engineer should be removed, the Contractor shall excavate and remove such unsuitable material to the width and depth ordered by the Engineer and backfilled with compacted PennDOT No. 2A stone.

The contractor will be reimbursed under the item entitled "Unsuitable Material Overexcavation and Backfill with PennDOT No. 2A Stone" based on the quantities determined by the Engineer.

3.05 CONCRETE FORMS AND FINISHING

The Contractor shall field form all of the concrete curb, gutters, and sidewalk to the lines and grades called for in the Plans. The Contractor may utilize wood or metal forms. All forms shall be cleaned thoroughly and greased or soaped before concrete is placed against them.

A. Concrete Curb

Do not remove forms until such time it will not be detrimental to the concrete. Correct irregular surfaces by rubbing with a Carborundum stone. Brush finishing or plastering will not be permitted. Fill minor defects with mortar.
B. Concrete Sidewalk and Driveway

Finish to produce surface with granular or matte texture that will not be slick when wet.

3.06 CONCRETE CURING AND PROTECTION

The concrete shall be cured for three (3) days under four (4) ply, wetted burlap kept saturated with water or by use of a sprayed-on curing compound (chlorinated rubber for concrete sealer and curing compound). Any spots that lighten (dry) shall be resprayed thoroughly. The curing compound shall be suitable for the purpose of curing and sealing the concrete. Once the concrete has been cured and has hardened, the Contractor shall apply two generous coats of linseed oil to all concrete to provide for anti-spalling resistance to salt.

The Contractor shall provide proper barriers and lighting to protect the fresh concrete for the curing period.

3.07 EXPANSION AND CONTROL JOINTS

Expansion joints shall be asphalt impregnated felt paper or a non-extruding expansion joint filler material of the thickness indicated in the plans. Filler joint material shall extend to or slightly below the bottom of the concrete slab. The top edge shall be held 7/8 inch below the surface of the slab by a tack strip of wood with its top flush with the finished curb surface. The edges of the concrete at the joint shall be tooled with an edging tool having a radius of 1/4". After the concrete has cured, the tack strips shall be removed and the joints sealed with a white elastomeric sealing compound to within 1/8 inch of the surface.

All control joints shall be a minimum of 25% of the depth of the slab in depth and be grooved into the concrete by use of a cutting tool. If the Contractor cannot falsemark the concrete to this depth using a cutting tool, then the Engineer will request that the Contractor cut the control joints to deepen them by use of a concrete saw.

3.08 PROTECTION OF EXISTING UTILITIES & STRUCTURES

The existence and location of underground utilities indicated on the plans are not guaranteed and shall be investigated and verified in the field by the Contractor before starting work. Excavation in the vicinity of existing structures and utilities shall be carefully done by hand. The Contractor shall be held responsible for any damage to, and for maintenance and protection of existing utilities and structures. For the protection of both himself and the Owner, the Contractor shall make a survey of adjacent properties before commencing operations. Such a survey shall locate all existing cracks and damages to the existing structures by means of drawings and photographs. Any refusal of Owners of adjacent property to permit entry for purpose of inspections shall be noted in the report.
Where existing utility curb boxes and meter pits exist within the alignment of the proposed concrete, the Contractor shall bring the tops (lids) of such objects flush with the top of the slab in accordance with the respective utility company's requirements. The cost for this work shall be included within the Contractor’s unit price for construction.

3.09 PROTECTION AGAINST VANDALISM

The Contractor shall be responsible for protecting all concrete curb, gutter, sidewalk, and driveway from vandalism. If the concrete curb, gutter, sidewalk, and/or driveway are vandalized, the Engineer may direct the Contractor to remove the vandalized portions of the work and reconstruct them at no additional cost to the Owner.

3.10 ACCOMMODATION OF DRAINAGE

Gutters, sewer drains and ditches shall be kept open at all times. No damming or ponding or water in gutters or other waterways will be permitted. The Contractor shall not direct any flow of water across or over pavements except through approved pipes or properly constructed troughs, and he shall, when so required and at his own cost and expense, provide pipes or troughs of such sizes and lengths as may be required and place the same as may be directed.

The grading in the vicinity of excavations shall be controlled so that the ground surface is properly pitched to prevent water from running into the excavation.

3.11 CLEAN UP

As the improvements are constructed and the work completed, the contractor shall, at his own cost and expense, remove and dispose of all surplus earth, stone, slag, or other material from the work in such manner and at such point or points on the lines or the work covered by the Contract, if so directed by the Engineer; and shall leave all roads, sidewalks and other places free, clear and in good order. In case the contractor fails to do so or to make satisfactory progress in doing so, within twenty-four (24) hours after the receipt of a written notice from the Engineer, the Owner may remove such surplus material and clear the roadways, sidewalks and other places, and the cost of said work shall be charged to the Contractor and deducted from any monies due or to become due him under the Contract.

END OF SECTION 02620
D. Additional finishing shall be provided as required in Division 9 for those surfaces which are to receive paints or protective coatings, dampproofing and other treatments, and be in accordance with the recommendations of the coating Manufacturer.

E. All concrete stairs, steps, platforms, landings and sidewalks and shall receive an application of 1/2-pound per square foot of silicon carbide grit. Surfaces receiving grit shall be finished with a wood float to provide a non-skid walking surface.

3.08 CONCRETE CURING

A. Protection against loss of moisture from the surface of the concrete shall be accomplished by keeping the surface continuously wet. One of the following methods shall be used: surface remaining in contact with the form; the covering with burlap or motton mats kept continuously wet and covered with polyethylene plastic; or continuous sprinkling of the expose surfaces.

B. No curing compounds shall be used on any surfaces to which pneumatic mortar is to be applied, or on which any other type of concrete mortar, paint or chemical waterproofing coating is to be used unless they are compatible with the intended coating and approved by the Engineer. In addition, curing compounds shall not be used on any concrete which will be used to store potable water.

C. During cold or hot weather, curing shall be as specified under "Placing Concrete in Cold or Hot Weather".

3.09 REPAIR OF EXISTING CONCRETE SURFACES

A. All existing surfaces, particularly those to be painted and/or surfaces roughened or damaged by demolition, cutting or patching shall be patched and/or repaired as required to produce a uniform surface suitable for the application of coatings and in accordance with the coating manufacturer's recommendations. Non-shrinking grout shall be used to fill all holes in existing surfaces; holes left due to the removal of existing equipment and facilities; or holes made as required for the installation of new equipment for the facilities. The methods of patching and/or repairing shall conform to the recommendations of the Manufacturer of the patching compounds or sealers used.

END OF SECTION 03300
SECTION 02765

PAVEMENT MARKINGS

PART 1 - GENERAL

1.01 SUMMARY

1.02 SECTION INCLUDES

A. Painting and marking of pavements, curbs, guard posts, and light pole bases.

1.03 REFERENCE STANDARDS

A. American Association of State Highway and Transportation (AASHTO)

1. AASHTO M248 - Ready-Mixed White and Yellow Traffic Paints

B. American Society for Testing and Materials (ASTM)

1. ASTM D4414 - Standard Practice for Measurement of Wet Film Thickness by Notch Gauges.

C. Federal Specifications (FS)

1. FS A-A-2886 - Paint, Traffic, Solvent Based (supersedes FS TT-P-85 and FS TT-P-115, Type I)

2. FS TT-P-1952 - Paint, Traffic And Airfield Marking, Waterborne

1.04 PROJECT CONDITIONS

A. Maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize flagmen, barricades, warning signs, and warning lights as required.

1.05 QUALITY ASSURANCE

A. Use trained and experienced personnel in applying the products and operating the equipment required for properly performed work.
PART 2 - PRODUCTS

2.01 Materials

A. Paint shall be waterborne or solvent borne, colors as shown or specified herein. Pavement marking paints shall comply with applicable state and local laws enacted to ensure compliance with Federal Clean Air Standards. Paint materials shall conform to the restrictions of the local Air Pollution Control District.

B. Waterborne Paint: Paints shall conform to FS TT-P-1952.

C. Solvent Borne Paint: Paint shall conform to FS A-A-2883 or AASHTO M248. Paint shall be non-bleeding, quick-drying, and alkyd petroleum base paint suitable for traffic-bearing surface and be mixed in accordance with manufacture's instructions before application for colors White, Yellow, Blue, and Red.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine the work area and correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.02 PREPARATION

A. Sweep and clean surface to eliminate loose material and dust.

B. Where existing pavement markings are indicated on Construction Drawings to be removed or would interfere with adhesion of new paint, a motorized abrasive device shall be used to remove the markings. Equipment employed shall not damage existing paving or create surfaces hazardous to vehicle or pedestrian traffic. Within public rights-of-way, appropriate governing authority shall approve method of marking removal.

C. New pavement surfaces shall be allowed to cure for not less than 30 days before application of marking materials.

3.03 CLEANING EXISTING PAVEMENT MARKINGS

A. In general, markings shall not be placed over existing pavement marking patterns. Existing pavement markings, which are in good condition but interfere or conflict with the newly applied marking patterns, shall be removed. Deteriorated or obscured markings that are not misleading or confusing or do not interfere with the adhesion of the new marking material do not require removal. Whenever
grinding, scraping, sandblasting or other operations are performed, the work shall be conducted in such a manner that the finished pavement surface is not damaged or left in a pattern that is misleading or confusing. When these operations are completed the pavement surface shall be blown off with compressed air to remove residue and debris resulting from the cleaning work.

3.04 APPLICATION

A. Apply two coats of paint at manufacturer's recommended rate, without addition of thinner, with maximum of 100 square feet per gallon or as required to provide a minimum wet film thickness of 15 mils and dry film thickness of 7 ½ mils per coat. Paint shall be applied for a total dry film thickness of 15 mils. Apply with mechanical equipment to produce uniform straight edges. At sidewalk curbs and crosswalks, use straightedge to ensure uniform, clean, and straight stripe.

B. Install pavement markings according to manufacturer's recommended procedures for the specified material.

C. Following items shall be painted with colors noted below:

1. Pedestrian Crosswalks: White
2. Exterior Sidewalk Curbs, Light Pole Bases, and Guard posts: Yellow
3. Fire Lanes: Red or per local code
4. Lane Striping where separating traffic moving in opposite directions: Yellow
5. Lane Striping where separating traffic moving in the same direction: White
6. ADA Symbols: Blue or per local code
7. ADA parking space markings as shown on the drawings.
8. Parking Stall Striping: Yellow, unless otherwise noted on Construction Drawings
9. Associate Parking Area: White, unless otherwise noted on Construction Drawings

3.05 FIELD QUALITY CONTROL

A. Inspection: After the paint has thoroughly dried, visually inspect the entire application and touch up as required to provide clean, straight lines and surfaces throughout.

B. Testing: Testing of wet film thickness shall be performed a minimum of two times on each parking row (including striped islands) and pedestrian cross walks, and a minimum of one test on each lane/alignment striping. At least one test shall be performed after refilling paint striping machine, changing operators of striping machine, and changing paint types, brands, etc. This shall be performed in
SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Includes:

Cast-in-place concrete required for the Work is indicated on the Drawings and includes, but is not necessarily limited to: footings and foundations; slabs on grade; structure and tank walls; elevated slabs; concrete fill in hollow unit masonry for structural columns, etc.; exterior flat Work; concrete equipment bases; curbs; piping and conduit encasement, blocking, etc.; and such other concrete as shown on the Drawings and/or as required by these Specifications or as may be reasonably inferred from either.

1.02 QUALITY ASSURANCE

In addition to complying with all pertinent codes, standards and regulations, the Contractor shall comply with all standards referenced in these Specifications and applicable portions of the following standards:

A. "Specifications for Structural Concrete", ACI 301.
B. "Recommended Practice for Measuring, Mixing and Placing Concrete", ACI 304.
C. "Recommended Practice for Hot Weather Concreting", ACI 305.
D. "Recommended Practice for Cold Weather Concreting", ACI 306.
E. "Building Code Requirements for Reinforced Concrete", ACE 318.
I. "Test for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate", ASTM C-88.


M. Deleted.


Q. "Test for Compressive Strength of Cylindrical Concrete Specimens", ASTM C-39.

R. "Method of Sampling Fresh Concrete", ASTM C-172.

S. "Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete", ASTM C-42.

1.03 SUBMITTALS

A. Materials List:

Before any concrete is delivered to the job site, the Contractor shall submit concrete mix design proportions; certified test results for the proposed mix; a complete list of all materials proposed to be furnished and installed under this portion of the Work, showing Manufacturer's name and catalog number of all items such as admixture and membrane; the name and address of the transit-mix concrete supplier; and sufficient additional evidence that the proposed concrete mix of mixes will meet the requirements set forth herein.

B. Transit-mix delivery slips:

A record shall be kept at the job site showing outdoor temperature, time and place of each pour of concrete, together with transit-mix delivery slips certifying the contents of the pour and that all materials conform to the requirements of these Specifications. The delivery slip shall indicate the mix; maximum size of aggregate; amount of mix water; design strength of the concrete; the time when the mix was made and such other information as may be required by the Engineers. Failure to render such slip to the General Contractor job superintendent shall automatically be
cause for rejection of the concrete. The General Contractor's job superintendent shall write on the back of the slip: 1) the time of arrival of the truck mixer on the site; 2) the time of deposit of the concrete from the truck mixer; and 3) the place of deposit of the concrete from the truck mixer. This record shall be made available to the Owner for his inspection upon request. Upon completion of each portion of the Work, the Contractor shall deliver the record and the delivery slips to the Owner. Repeated failure to deliver this information to the Owner may be cause for the Owner to reject the deposited concrete at any time and to require that it be removed and replaced at the Contractor's expense.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cement shall be Portland Cement, conforming to ASTM C-150, Type IA, or in the event that field conditions require, and where approved, high-early strength Portland Cement, Type IIIA. All cement shall be obtained from one source. Cement used in the Work shall correspond to that upon which the selection of concrete proportions was based.

B. Aggregates shall conform to ASTM C-33, except as revised herein. Aggregates failing to meet the aforementioned standard, but which have been shown by special test or actual service to produce concrete of adequate strength and durability, may be used when specifically approved by the Engineer. Additional specific requirements for aggregates are as follows:

1. Fine aggregates shall be clean, hard, natural sand. When tested in accordance with ASTM C-117, the weight removed by the test shall not exceed 3%. The amount of coal and clay shall not exceed 0.25% and 1% respectively.

2. Coarse aggregates shall consist of crushed stone or crushed gravel. When tested in accordance with ASTM C-88, the loss shall not exceed 10%, and when tested in accordance with ASTM C-131, the loss shall not exceed 45%.

3. The nominal maximum size of coarse aggregate shall not be larger than one-fifth the narrowest dimension between sides of forms; nor one-third the depth of slabs; nor three-fourths the minimum clear spacing between individual reinforcing bars or wires, bundles of bars, or prestressing tendons or ducts. In no case shall the maximum size exceed 1-1/2 inches. For section of 12 inch thickness or less, the maximum size shall not exceed 1 inch. Coarse aggregate gradations shall conform to ASTM C-33 for the types of concrete being used in this Work as described hereafter.
C. Water used in mixing and curing concrete shall be fresh, clean and free from injurious amounts of sewage, oil, acid, alkali, organic matter or other deleterious substances. Water shall be approved for human consumption.

D. Admixtures to be used in concrete shall be subject to prior approval by the Owner. Air-entraining admixtures shall conform to ASTM C-260. Water reducing admixtures, retarding admixtures, accelerating admixtures, water-reducing and retarding admixtures, and water-reducing and accelerating admixtures shall conform to ASTM C-494. Fly ash will not be permitted on this Project. Other pozzolans such as plasticizers used as admixtures shall conform to ASTM C-618. Admixture proportions shall be in strict accordance with the Manufacturer's recommendations and must approved by the Engineer prior to using same.

2.02 CONCRETE

A. For the purposes of this Project, the following minimum criteria for the various classes of concrete shall be established:

<table>
<thead>
<tr>
<th>Class of Concrete</th>
<th>Compressive Strength</th>
<th>Coarse Aggregate ASTM C-33 Size No.</th>
<th>Bags of Portland</th>
<th>Cement Per CY of Concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A</td>
<td>4,000 psi</td>
<td>No. 467 or 57</td>
<td>6 1/2 Bag Mix</td>
<td></td>
</tr>
</tbody>
</table>

B. Proportions of materials for concrete shall be established to provide adequate workability and proper consistency to permit concrete to be worked readily into the forms and around reinforcement under conditions of placement to be employed without excessive segregation bleeding; to provide resistance to freezing and thawing and other aggressive actions; and to provide conformance with the strength requirements as established by these Specifications. Methods of determining proportions and design mixes shall conform to ACI 318. All concrete, unless otherwise approved, shall be transit-mixed in accordance with ASTM C-94. Concrete shall, unless otherwise specified or approved, be air-entrained conforming to ACI 318. The slump of the concrete mix shall not in any case exceed 3 inches for heavy sections or suspended or at-grade floors, or 4 inches elsewhere.

C. The use of admixtures will be considered provided that the Contractor submits sufficient evidence that the concrete produced will meet the requirements of these Specifications and that such admixtures are capable of maintaining essentially the same composition and performance throughout the Work as the project used in establishing concrete proportions. Admixtures containing chloride ions shall not be used in concrete containing aluminum embedments if their use will produce a deleterious concentration of chloride ions in the mixing water. The use of flyash will not be permitted in concrete for this Project.
D. Concrete shall be Class A at all locations unless otherwise specified. Class B concrete shall be used in walls and slabs 6 inches or less in thickness; and for closing openings in walls around pipes. Class C concrete shall be used for pipe cradle backfill or as shown on the Drawings.

2.03 MEMBRANES

A. All vapor barrier membrane under concrete slabs shall be 6-mil weight sheet plastic in sheet as wide as possible to minimize joints.

B. All curing membrane shall be sheet plastic as specified for vapor barrier, a combination sheet plastic and paper, or an equal approved in advance by the Engineer.

C. All cement or tape used for sealing membrane joints shall be only as recommended by the Manufacturer of the membrane being joined.

2.04 OTHER MATERIALS

A. Preformed expansion joint filler shall be a self-expanding cork conforming to ASTM D-1752, Type III as manufactured by Servicised Products Division, W.R. Grace & Co., Sonoflex Cork as manufactured by Sonneborn-Contech, or approved equal.

B. Epoxy bonding compounds shall be Sikastik 370 as manufactured by Sika Chemical Corporation; Concresive 1001-LPL or 1180 as manufactured by Adhesive Engineering Company; Sonobond as Manufactured by Sonneborn-Contech; or approved equal. Products shall be suitable for use on horizontal or vertical surfaces as required for the Work and applied in accordance with the Manufacturer's recommendations.

C. Premixed non-shrink grout shall be Vibro Foil as manufactured by W.R. Grace & Co.; Embeco 636 as manufactured by Master Builders; or approved equal.

D. Materials for repair of existing concrete surfaces shall be Colma Dur LV, Colma Dur Gel and/or Colma Fix LV as manufactured by Sika Chemical Corporation, similar products as manufactured by American Metaseal Company, or approved equal, and shall be installed in accordance with the Manufacturer's recommendations and the requirements of this Section.

E. All other materials not specifically described but required for a complete and proper installation of cast-in-place concrete shall be as selected by the Contractor subject to the approval of the Engineer. Materials identified on the Drawings by Manufacturer or product name shall conform to the standard specifications for the particular manufactured product.
PART 3 - EXECUTION

3.01 PREPARATION

Preparation of equipment and place of deposits of concrete shall conform to ACI 318 and ACI 614. The Contractor shall notify the Engineer at least 48 hours before placing concrete.

3.02 MIXING AND PLACING CONCRETE

A. Mixing and placing concrete shall be done in accordance with appropriate portions of ASTM C-94, ACI 318 and/or ACI 304, except as modified or revised by these Specifications.

B. Before deposition of concrete, all debris shall be removed from the space to be occupied by the concrete. Forms, if constructed of lumber, shall be thoroughly wetted except in freezing weather. Reinforcement, pipe sleeves and other materials to be embedded in the concrete shall be thoroughly secured in position and cleaned of ice or other deleterious substances. Water shall be removed from the space to be occupied by the concrete before concrete is deposited.

C. Forms for walls or thin sections of considerable height shall be provided with openings or other devices that will prevent segregation and accumulation of hardened concrete on the forms or on the metal reinforcement above the level of the concrete.

D. Where concrete is conveyed to chutes, the equipment shall be of such size and design as to insure a continuous flow in the chute. The chutes shall be of metal, or metal-lined, and if two or more lengths are used, they shall have approximately the same slope. The slope shall not be less than one vertical to three horizontal nor more than one vertical to two horizontal and shall be such as to prevent the segregation of the ingredients. The discharge end of the chute shall be provided with a baffle plate to prevent segregation. If the distance of the discharge end of the chute above the surface of the concrete is more than 3 times the thickness of the layer being deposited, or more than 4 feet above the surface of the concrete, a spout or "elephant trunk" shall be used, and the lower end maintained as near to the surface of deposit as practical. When the operation is intermittent, the chute shall discharge into a hopper. The chute shall be thoroughly cleaned before and after each run and the debris from any water used shall be discharged outside the forms.

E. Before depositing new concrete on or against concrete which has hardened and to which it is to bond, the forms shall be re-tightened. The surface of the hardened concrete shall be roughened in a manner that will not leave loosened particles of aggregate or damaged concrete at the surface. It shall be thoroughly cleaned of foreign matter and laitance, and saturated with water. To insure an excess of mortar
at the juncture of the hardened and newly deposited concrete, the cleaned and saturated surface, including inclined surfaces, shall be first thoroughly covered with a coating of mortar or neat cement grout against which the new concrete shall be placed before the grout has attained its initial set. Epoxy bonding compound shall be used where new concrete is to be deposited on or against existing concrete surfaces and/or where indicated on the Drawings. It shall be applied in accordance with the Manufacturer's recommendations.

F. Concrete during and immediately after deposition shall be thoroughly compacted by means of vibration. The number of vibrators used shall at all times be subject to the approval of the Engineer. The concrete shall be thoroughly worked around the reinforcement, around embedded fixtures, and into the corners of the forms. The accumulation of water on the surface of the concrete due to water gain, segregation, or other causes during placement and compacting shall be prevented as far as possible by adjustments in the mixture. Provision shall be made for the removal of such accumulated water so that under no circumstances will concrete be placed in such accumulation.

G. To minimize the formation of laitance, great care shall be exercised to disturb the concrete as little as possible while it is being deposited. Upon completion of a section of concrete, all laitance shall be entirely removed before Work is resumed. The Contractor shall submit to the Engineer, prior to start of Work, the details of procedures he proposes to use to minimize and control the development of shrinkage cracks.

H. Sufficient time must elapse after depositing concrete in the walls for the walls to obtain sufficient strength before depositing concrete in beams, girders, or slabs supported thereon. Beams and girders shall be considered as part of the floor system and shall be placed monolithically therewith.

3.03 SAMPLING AND TESTING REQUIREMENTS

A. The Contractor shall provide and pay for sampling and testing of the concrete incorporated into the Work by an approved Independent Testing Laboratory (ITL). All test results must be furnished to the Engineer within five (5) days following the date of testing. Failure to submit test results in accordance with this provision will be deemed sufficient cause for the Engineer to reject the respective concrete incorporated in the Work.

B. One test shall be made for each pour and each 25 cubic yards of concrete placed. The laboratory shall maintain records showing brands of cement, brand and quality of admixtures, time and location of the batch form which the test was made, air content, slump and compressive strength. The laboratory shall supply the test cylinders, slump cones, field technicians and all equipment necessary for performance of field and laboratory testing specified herein.
C. One strength test shall consist of four field specimens, one (1) specimen for testing at seven (7) days, one (1) specimen for testing at fourteen (14) days, and two (2) specimens for testing at twenty-eight (28) days. The samples for strength tests shall be taken in accordance with ASTM C0-172. Cylinders for acceptance tests shall be molded and laboratory cured in accordance with ASTM C-31 and tested in accordance with ASTM C-39. Each strength test result shall be the average of two cylinders from the same sample tested at seven (7), fourteen (14), and twenty-eight (28) days.

D. When the frequency of testing will provide less than five strength tests for a given class of concrete, test shall be made from five randomly selected batches or from each batch if fewer than five are used. When the total quantity of a given class of concrete is less than 50 cubic yards, the strength tests may be waived by the Engineer if, in his judgment, adequate evidence of satisfactory strength is provided.

E. Strength tests of specimens cured under field conditions in accordance with ASTM C-31 may be required by the Engineer to check the adequacy of curing and protection of the concrete in the structure. Such specimens shall be molded at the same time and from the same samples as the laboratory-cured acceptance test specimens. Procedures for protecting and curing the concrete shall be improved when strength of field-cured cylinders at the test age designated for measuring specified strength (f'c) is less than 85% of that of the companion laboratory-cured cylinders. When the laboratory-cured cylinder strengths are appreciably higher than specified strength (f'c) the field-cured cylinder strengths need not exceed f'c by more than 500 psi, even though the 85% criterion is not met.

F. Non-compliance and/or non-satisfactory strength test results shall be determined by the Engineer and/or Contractor and such information will be relayed expeditiously to the concrete supplier and confirmed promptly in writing. Test results of concrete furnished subsequent to such notification shall comply or a second warning will be issued. Non-compliance after two warnings will be sufficient cause to refuse additional concrete from the non-complying concrete supplier.

G. Reinstatement of a disqualified concrete supplier may be permitted only upon certification by an independent qualified engineer, retained by the concrete supplier and acceptable to the Engineer, attesting to the fact that adequate corrective measures have been taken. Failure after this point will result from the job. Any additional cost resulting therefrom will be the responsibility of the General Contractor.

H. Should individual test of laboratory-cured specimens produce strengths more than 500 psi below specified strength (f'c), or should tests of field cured cylinders indicate deficiencies in protection and curing, steps shall be taken to assure that load-carrying capacity of the structure is not jeopardized. If the likelihood of low
strength concrete is confirmed and computations indicate that the load-carrying capacity may have been significantly reduced, tests of cores drilled from the area in question may be required in accordance with ASTM C-42. Three cores shall be taken for each cylinder test more than 500 psi below specified strength (f’c).

If the concrete in the structure will be dry under service conditions, the cores shall be air-dried (temperature 60°F to 80°F, relative humidity less than 60%) for 7 days before the test and shall be tested dry. If the concrete in the structure will be more than superficially wet under service conditions, the cores shall be immersed in water for at least 48 hours and then tested wet.

I. Concrete represented by the core tests will be considered structurally adequate if the average of the three cores is equal to at least 85% of specified strength (f’c) and if no single core is less than 75% of f’c. To check testing accuracy, locations represented by erratic core strengths may be retested. If these strength acceptance criteria are not met by the core tests, and if structural adequacy remains in doubt, the Engineer may order load tests for the questionable portion of the structure, or take other appropriate action, which may include the complete replacement of the defective portion.

J. Costs of all sampling and testing as specified herein shall be paid for by the Contractor.

3.04 PLACING CONCRETE IN COLD OR HOT WEATHER

A. When the temperature of the surrounding air is below 40°F or above 90°F, concrete placement shall be performed in accordance with the provisions of ACI 306 or ACI 305, respectively, except as modified or revised by these Specifications.

B. During cold weather, the concrete shall be maintained at a temperature of 55°F for Class B concrete and 50°F for Class A or Class C concrete for a minimum of five days after placing. During this period concrete and adjacent form surfaces shall be kept moist at all times. When heated enclosures are to be provided, care shall be taken to provide adequate space around the other edges and top of the concrete structure to permit circulation of the heated air, so that neither freezing nor excessive heating of these extremities can occur. All facilities for protection and heating must be on hand before the concrete is placed.

C. After the required protection period is over, the heat shall be removed gradually and uniformly so that there will be a temperature differential of no more than 40°F over any 24-hour period.

D. Forms shall not be removed from the concrete surface during the protection period of three (3) days during those seasons of the year when the difference between the daily high and low temperatures may reasonably be expected to exceed 40°F.
E. At air temperatures of 90°F or above, concrete should be kept as cool as possible during placing and curing. Concrete surfaces shall be kept continuously moist by wet-curing for at least 24 hours after the concrete has been placed and water shall be applied to formed surfaces while forms are still in place. After the period of wet curing, a suitable heat-reflecting plastic membrane or white-pigmented curing compound may be used.

3.05 DEFECTIVE CONCRETE

A. Defective concrete is defined as concrete, in place which does not conform to the strength, shapes, alignments or elevations as shown on the Drawings and/or which presents faulty surface areas.

B. All defective concrete shall be removed and replaced in a manner meeting with the approval of the Engineer or, should only surface imperfections occur, may be patched at the discretion of and in a manner satisfactory to the Engineer; however, permission to patch the Work shall not be considered as a waiver of the Owner's right to require complete removal and replacement of such defective concrete should the patching fail to satisfactorily restore the required quality and/or appearance of the surface.

C. Surface defects that require replacement or repair are those that consist of honeycomb; damage due to stripping forms; loose pieces of concrete; surface holes caused by bolts and ties; excessive ridges at form joints; and bulges due to movement of the forms. Ridges and bulges shall be removed by chipping, tooling or grinding on finished surfaces. Honeycomb and other defective concrete shall be chipped out and filled with mortar, the chipped openings having sharp edges and shaped so that the mortar filling will be keyed in place. All holes shall be kept thoroughly moistened for several hours before mortar filling is place.

D. Imperfections, bolt and tie-rod holes, and chipped-out honeycomb areas to be repaired shall be filled with drypatching mortar composed of one part of Portland Cement to two parts of regular concrete sand (volume measurement) and just enough water so that, after the ingredients are mixed thoroughly, the mortar will stick together on being molded into a ball by slight pressure of the hands, and not exude free water. Mortar repairs shall be placed in thin layers thoroughly compacted by suitable tools. Care shall be taken in filling rod and bolt holes so that the entire depth of the hole is completely filled with compacted mortar. "Embeco", or equal, shall be added to all patching mortar in an amount as recommended by the Manufacturer for the mix to be used except for unpainted, exposed surfaces.
3.06 CONSTRUCTION JOINTS

The Contractor shall make and locate construction joints so as not to impair the strength of the structure. The Contractor shall obtain the Engineer's approval of the locations of all construction joints and control joints in the Work prior to the start of concrete placement.

3.07 CONCRETE FINISHING

A. All concrete surfaces shall be finished as specified as soon after the placing of concrete and removal of forms as conditions will permit. All patching and pointing shall be performed immediately after the forms have been removed and rubbing of concrete surfaces shall be performed as soon as possible thereafter.

B. All exposed formed concrete surfaces on the interior of structures; on the interior of tanks containing liquids from the top to a point 1 foot below the lowest working liquid level shown on the Drawings; or on the exterior of structures or appendages from the top to a depth of 1 foot below finished grade shall receive a rubbed finish. Unless otherwise specified, all other formed concrete surfaces shall be pointed with mortar as described herein and shall be pointed with mortar as described herein and shall have all fins and projections in excess of 1/8 inch removed. Form ties shall be removed to a depth of a least 1 inch beneath the surface and all air bubbles, cavities, stone pockets, honeycombing and tie and bolt holes shall be pointed with mortar. The mortar mix shall be determined by trial to obtain a good color match with the concrete when both the patch and concrete and cured and dry.

The amount of mixing water shall be the minimum possible consistent with the requirements for handling and placing the mortar. Fins, form marks, projections and uneven spots shall be removed by rubbing or grinding and surfaces left smooth, dense and free of grain marking and bulges or depressions more than 1/8-inch in 4 feet. When the mortar pointing has set and when rubbed finish is required, the entire exposed surface shall be thoroughly covered with water and rubbed with a carborundum brick or other approved means to remove all blemishes and provide a smooth finish of uniform texture and appearance.

C. Unless otherwise indicated, the tops of all exposed walls or steps and all slabs or flat unformed concrete surfaces shall be struck off to establish grade and floated with a wood float until all irregularities are removed, as a minimum, to produce a relatively smooth, level and even textured surface without sharp ridges. All interior floors, platforms and flume bottoms which are exposed to view shall receive a steel trowel finish once all excess water has evaporated from the floated surface. Tolerance from finish surface lines shall be a maximum of 1/8-inch in 10 feet with maximum high and low variances not occurring in less than 20 feet and with 1/16-inch tolerances in any one running foot with no abrupt variations. Floors shall slope uniformly to floor drains where they are provided.