# City of New London

Department of Finance-Purchasing Agent
13 Masonic Street • New London, CT 06320 • Phone (860) 447-5215 • Fax (860) 447-5297


## Invitation for Bids

### ADDENDUM

**Bid No.: 2017-04**

**Addendum No.: 1** **Date Issued: October 14, 2016**

**Ocean Avenue Roadway Reconstruction**

**Opening Date and Time: October 19, 2016 at 2:00 P.M.**

**Bidders Notes:**

All other terms and conditions remain the same.

**This Addendum cover page must be signed and returned with your bid.**

_____ _____

Authorized Signature of Bidder Company Name

**Return Bid To:**

Alicia Smith, Purchasing Agent
City of New London
13 Masonic Street
New London, CT 06320

Bids cannot be accepted after the Bid Opening Date and Time indicated above.

**ADDENDUM ONE**
October 11, 2016

to
**CONTRACT DOCUMENTS**
for

**OCEAN AVENUE RECONSTRUCTION**
New London, Connecticut 06320

This addendum modifies, amends and supplements designated parts of the Contract Documents dated September 2, 2016 for the project identified as Ocean Avenue Roadway Reconstruction, From Niles Hill Road to Neptune Avenue and is hereby made a part thereof by reference and shall be as binding as though inserted in its entirety in the locations designated. It shall be the responsibility of each Bidder to notify all subcontractors and suppliers he proposes to use for the various parts of the work of any changes or modifications contained in this Addendum. No claims for additional compensation due to the lack of knowledge of the contents of this Addendum will be considered.

# CONTRACT CHANGES

## SECTION 00410 – FORM OF GENERAL BID

**DELETE:**

Section 00410 – Form of General Bid, Pages 1-14.

**ADD:**

Attached Section 00410 – Form of General Bid, Pages 1-14.

## SECTION 01270 – MEASUREMENT AND PAYMENT

**DELETE:**

Section 01270 – Measurement and Payment, Pages 1-9.

**ADD:**

Attached Section 01270 – Measurement and Payment, Pages 1-9.

## SECTION 01400 – QUALITY REQUIREMENTS

**DELETE:**

Section 01400 – Quality Requirements, Pages 1-7.

**ADD:**

Attached Section 01400 – Quality Requirements, Pages 1-7.

## SECTION 03302 – FIELD CONCRETE

**DELETE:**

Section 03302 – Field Concrete, Pages 1-4.

**ADD:**

Attached Section 03302 – Field Concrete, Pages 1-4.

# CLARIFICATION

1. Is the Driveway to the School, at ±STA 5+60 Left on Sheet 3, to be paid as Driveway or Roadway?
   *The School driveway shall be constructed and paid for as roadway.*

2. Please explain Item #40 Relocate Existing Utility Pole. On all other City of New London projects, utility poles were relocated by the respective utility company under an agreement with the city.
   *Item #40 is intended to cover the costs of the fee the utility company charges for each pole relocation, and all required coordination with the local utility companies. The relocation fee varies on a case by case basis, but is typically in the range of $2,000 to $10,000 depending on the complexity of the move.*

3. Catch Basins numbered CB-13 on Sheet 4 and CB-14 on Sheet 9 are noted as "Outlet Basin No Discharge Pipe". The noted catch basins are located at the low point of the pipe run, where does the water go?
   *Catch Basins 13 and 14 will allow water from the up gradient systems to discharge back into the gutter of the street via the grate inlet. This arrangement matches existing conditions in these two locations.*

4. The drainage run between STA 4+05.78 and STA 6+52.11 is listed as 15" CPP on Sheet 2 and 15" CPP Perforated on Sheet 3. What is the correct type of pipe that is to be used?
   *All 15" CPP on the project shall be solid pipe.*

5. Note #8 on the General Notes on Sheet 11, Section C-C does not show depth of concrete curb. Please provide dimensions of concrete curb for the transition curb.
   *Concrete transition curbs shall extend a minimum of 9-inches below finish pavement grade.*

6. Specification call for Calcium Chloride to be applied at the rate of 1.0 gallons per cubic yard. The roadway section on Sheet 11 indicates an application rate of 1.25 gallons per cubic yard. What is the correct rate of application?
   *Calcium Chloride shall be applied at a rate of 1.0 gallon per cubic yard.*

**ADDENDUM SUMMARY**

1. Base Bid shall be the computed total of Items 1 through 50 inclusive.

2. Clarifications have been added to Section 01270 Measurement & Payment.

3. Hot Mix Asphalt Testing Requirements have been added to Section 01400 Quality Requirements.

4. Testing requirements indicated in Section 03302 Field Concrete have been modified to conform to requirements indicated in Section 01400 Quality Requirements.

5. Responses provided to Contractor submitted questions.

# SECTION 00410

## FORM OF GENERAL BID

Bid of _____ (hereinafter called "Bidder")*

(_____) a corporation, organized and existing under the laws of the state of _____

(_____) a partnership

(_____) a joint venture

(_____) an individual doing business as _____

To the City of New London, Connecticut (hereinafter called "Owner").

Gentlemen:

The Bidder, in compliance with your invitation for bids for the Ocean Avenue Roadway Reconstruction Project, having examined the plans and specifications with related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to construct the project in accordance with the contract documents within the time set forth below, and at the prices stated below. These prices are to cover all expense incurred in performing the work required under the contract documents, of which this proposal is a part.

The Bidder hereby agrees to commence work under this contract on or before a date to be specified by the Owner in the written Notice to Proceed, and to fully complete the project within timeframe indicated in the Agreement, exclusive of the winter shut-down period (November 15th through April 1st). The Bidder further agrees to pay liquidated damages as described in the Agreement.

* Insert corporation, partnership or individual as applicable.

Bidder acknowledges receipt of the following addenda:

No. _____ Dated: _____

No. _____ Dated: _____

No. _____ Dated: _____

**UNIT PRICE BID:**

**BASE PROPOSAL:** Bidder agrees to perform all of the work described in the specifications and shown on the plans for the following unit prices:

Amount shall be in both words and figures. In case of discrepancy, the amount shown in words will govern.

Item quantities are assumed for comparison of bids.

**OCEAN AVENUE (Niles Hill Road to Neptune Avenue)**

**Mobilization & Project Closeout**

| Item No. | Est. Qty. | Description |
|---|---|---|
| 1 | 1 | Mobilization & Project Closeout, lump sum |

Unit Price _____ (dollars) and _____ (cents) ($ _____) Total Item $ _____

**Drainage Pipe**

| Item No. | Est. Qty. | Description |
|---|---|---|
| 2 | 40 lf | 8-inch SDR 35 PVC Drainage Pipe, per lf |

Unit Price _____ (dollars) and _____ (cents) ($ _____) Total Item $ _____

| | | |
|---|---|---|
| 3 | 940 lf | 8-inch Perforated SDR 35 PVC Drainage Pipe, per lf |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 4 | 340 lf | 12-inch HDPE Drainage Pipe, per lf |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 5 | 24 lf | 12-inch Reinforced Concrete (Type IV) Drainage Pipe, per lf |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 6 | 720 lf | 15-inch HDPE Drainage Pipe, per lf |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 7 | 525 lf | 18-inch HDPE Drainage Pipe, per lf |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

**Precast Catch Basins, Manholes, and Appurtenances**

| Item No. | Est. Qty. | Description |
|---|---|---|
| 8 | 7 | Precast Concrete Manhole with Standard Frame and Cover, 4 ft Diameter, each |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 9 | 9 | 12-inch Diameter PVC Drain Basin, each |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 10 | 9 | Precast Concrete Type 'C' Catch Basin with 4 ft Sump, each |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 11 | 1 | Precast Concrete Type 'C' Catch Basin with No Sump, each |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 12 | 2 | Precast Concrete Type II double Type 'C' Catch Basin with 4 ft Sump, each |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 13 | 1 | Precast Concrete Type II double Type 'C' Catch Basin with No Sump, each |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 14 | 3 | Precast Concrete Offset Type 'C' Catch Basin with 4 ft Sump, each |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 15 | 5 | Hydrodynamic Separator Unit, 4 ft Diameter, each |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 16 | 14 | Catch Basin Hood, each |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

**Concrete Sidewalk**

| Item No. | Est. Qty. | Description |
|---|---|---|
| 17 | 1,560 sy | Cement Concrete Sidewalk, per sy |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 18 | 345 sy | Cement Concrete Wheelchair Ramp, per sy |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 19 | 445 sy | Cement Concrete Driveway Apron, per sy |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 20 | 395 cy | Processed Gravel Base Course for Concrete Sidewalk, Wheelchair Ramp, & Driveway Apron, per cy |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

**Signage**

| Item No. | Est. Qty. | Description |
|---|---|---|
| 21 | 31 | Provide Signage, each |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 22 | 2 | Relocate Existing Signage, each |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

**Curbing**

| Item No. | Est. Qty. | Description |
|---|---|---|
| 23 | 2,220 lf | Granite Curb, per lf |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 24 | 6,490 lf | Remove & Reset Granite Curb, per lf |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

**Pavement Replacement**

| Item No. | Est. Qty. | Description |
|---|---|---|
| 25 | 1,600 lf | Temporary Trench Pavement, per lf |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 26 | 19,310 sy | Reclaim Roadway Pavement & Subbase, per sy |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 27 | 5,400 gal | Calcium Chloride for Subbase Stabilization, per gallon |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 28 | 1 | Grading and Compaction of Roadway Base Course, lump sum |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 29 | 2,780 tons | HMA S0.5 (Superpave) Binder Course Pavement, per ton |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 30 | 2,780 tons | HMA S0.375 (Superpave) Top Course Pavement, per ton |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 31 | 870 gal | Bitumen for Tack Coat, per gallon |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 32 | 590 lf | Hot Poured Joint Sealer, per lf |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 33 | 75 tons | Bituminous Concrete Driveway, per ton |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 34 | 1 | Pavement Markings, lump sum |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 35 | 50 ton | Additional Pavement, per ton |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

**Rock Excavation and Disposal**

| Item No. | Est. Qty. | Description |
|---|---|---|
| 36 | 100 cy | *Rock Excavation and Disposal, per cy |

Unit Price *Thirty* Total Item $ *3,000.00*
(dollars)
and *Zero*
(cents)
($ *30.00*)

| | | |
|---|---|---|
| 37 | 100 cy | *Rock Excavation and Disposal, per cy (add'l) |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

* The unit price in Item 36 is the minimum for rock excavation and disposal. Bidder may add to the minimum in Item 37.

**Earthwork**

| Item No. | Est. Qty. | Description |
|---|---|---|
| 38 | 100 cy | **Gravel Fill, per cy |

Unit Price _____ *Twenty* _____ Total Item $ *2,000.00*
(dollars)
and _____ *Zero* _____
(cents)
($ _____ *20.00* _____)

| | | |
|---|---|---|
| 39 | 100 cy | **Gravel Fill, per cy (add'l) |

Unit Price _____ Total Item $ _____
(dollars)
and _____
(cents)
($ _____)

** The unit price in Item 38 is the minimum for gravel fill. Bidder may add to the minimum in Item 39.

**Utility Poles**

| Item No. | Est. Qty. | Description |
|---|---|---|
| 40 | 4 | Relocate Existing Utility Pole, each |

Unit Price _____ Total Item $ _____
(dollars)
and _____
(cents)
($ _____)

**Landscaping**

| Item No. | Est. Qty. | Description |
|---|---|---|
| 41 | 1 | Loaming (6-inches thick) and Seeding, lump sum |

Unit Price _____ Total Item $ _____
(dollars)
and _____
(cents)
($ _____)

| | | |
|---|---|---|
| 42 | 1 | Removal & Disposal of Existing Trees, lump sum |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 43 | 1 | Selective Trimming of Existing Trees, lump sum |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

**Repair of Street Sign Monuments**

| Item No. | Est. Qty. | Description |
|---|---|---|
| 44 | 1 | Repair of Existing Street Sign Monuments, lump sum |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

**Environmental Protection**

| Item No. | Est. Qty. | Description |
|---|---|---|
| 45 | 16 | Inlet Protection, per catch basin |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

**Traffic Signals**

| Item No. | Est. Qty. | Description |
|---|---|---|
| 46 | 1 | Remove Existing Traffic Signals & Appurtenances at Intersection of Ocean Avenue & Glenwood Avenue, lump sum |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 47 | 1 | Remove Existing Traffic Signals & Appurtenances at Intersection of Ocean Avenue & Neptune Avenue, lump sum |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

| | | |
|---|---|---|
| 48 | 1 | Remove & Replace Existing Loop Detector at Intersection of Niles Hill Road & Ocean Avenue, lump sum |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

**Maintenance & Protection of Traffic**

| Item No. | Est. Qty. | Description |
|---|---|---|
| 49 | 1,300 hrs | Uniformed Officer for Traffic Control, per hour |

Unit Price *Ninety-Seven* Total Item $ *126,750.00*
(dollars)
and *Fifty*
(cents)
($ *97.50*)

| | | |
|---|---|---|
| 50 | 1 | Traffic Control, lump sump |

Unit Price _____ Total Item $_____
(dollars)
and _____
(cents)
($_____)

**TOTAL OF BASE BID (Ocean Avenue)**

The Base Bid computed contract price for Items 1 through 50 inclusive is:

_____

Dollars and _____ Cents

($_____).

Based upon findings:

The undersigned agrees that, if he is selected as general contractor, he will within seven consecutive calendar days (holidays excluded), after presentation thereof by the awarding authority, execute a contract in accordance with the terms of this bid and furnish a performance bond and also a labor and materials or payment bond, each of a surety company qualified to do business under the laws of the State of Connecticut and satisfactory to the awarding authority and each in the sum of the contract price, the premiums for which are to be paid by the general contractor and are included in the contract price.

The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work and that he will comply fully with all laws and regulations.

The undersigned further certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the State of Connecticut.

I certify under the penalties of perjury that I, to my best knowledge and belief, have filed all state tax returns and paid all state taxes required under law.

Respectfully submitted:

Date: _____ By: _____
(Signature)

_____
(Name of Bidder)

(SEAL - if bid is by a corporation)

_____
(Title)

_____
(Business Address)

_____
(City and State)

_____
(Telephone Number)

# SECTION 01270

# MEASUREMENT AND PAYMENT

## PART 1 - DESCRIPTION

### 1.01 GENERAL:

A. The following subsections describe the measurement of and payment for the work to be done under the items listed in Section 00410, FORM OF GENERAL BID.

B. All work performed as described in these contract documents shall be paid for under one or more of the items listed in Section 00410, FORM OF GENERAL BID. All other activities required in connection with performance of the work, whether described in the contract documents or mandated by applicable codes, permits and laws, will not be separately paid for unless specifically provided for in the FORM OF GENERAL BID, but will be considered incidental to performance of the overall project.

C. Each unit or lump-sum price stated in the Section 00410, FORM OF GENERAL BID shall constitute full compensation as herein specified for each item of work completed in accordance with the drawings and specifications.

D. The payment items listed herein and in Section 00410 (FORM OF GENERAL BID) are intended to provide full payment for the work shown on the drawings and specified herein. Any work called for or implied in the documents but not listed as a payment item shall be considered incidental to the overall project.

E. Unless otherwise noted, all earthwork shall be included under any item requiring excavation. Unless otherwise noted, each item specified or shown on the drawings shall be furnished and installed in accordance with the technical section whether a specific applicable payment item exists or not.

F. The prices for those items which involve excavation shall include compensation for disposal of surplus excavated material, and installation of all necessary sheeting and bracing.

G. In all items involving excavation, the price shall be based on doing the entire excavation in earth. Where rock is excavated, the price therefore shall be in addition to the cost of excavating the earth, and no deduction shall be made in the amount for earth excavation.

H. The price for all pipe items for sewers, wyes, service connections, chimneys, fittings, and other pipelines shall constitute full compensation for furnishing, laying, jointing, and testing pipe; earth excavation and backfill; by-pass pumping; crushed stone bedding; and clean up.

I. The prices for those items which require Quality Assurance/Quality Control Inspections and Testing shall include compensation for all required services, inspections, and tests as specified herein.

### 1.02 MOBILIZATION & PROJECT CLOSEOUT

A. The unit price for this item shall constitute full compensation for all costs associated with: Insurance, Bonding, Preparation & Submittal of Shop Drawings, Mobilization, Project Administration, Safety Programs, Preparation & Submission of Record Drawings, Site Cleanup &

Maintenance. Payment for this item shall be made based on the following schedule: 25% following receipt and approval of required insurance certificate(s), bonding, and shop/working drawings; 25% when 40% of the original Contract Price is earned; 25% when 80% of the original Contract Price is earned; and 25% following receipt and approval of record drawings.

1.03 DRAINAGE PIPE:

A. The length of drainage pipe to be paid for under the appropriate subdivisions of this item shall be measured by the linear foot along the completed drain, from centerline of structure to centerline of structure. The unit prices shall constitute full compensation for constructing the drains, complete in place as indicated in the drawings and as specified, including furnishing and installing pipe and fittings, excavation, backfill, crushed stone bedding, select material, filter fabric, clearing, grubbing, testing, removal and disposal of existing drain pipe, and all work incidental thereto and not specifically included for payment under other items.

1.04 PRECAST CATCH BASINS, MANHOLES, AND APPURTENANCES:

A. Unless otherwise provided for, the work shall be measured per unit of completed work under the appropriate subdivisions of the item Precast Catch Basins, Manholes, and Appurtenances.

B. Bases, walls, cones, frames, and covers shall be measured per set installed in place. The unit price for this subdivision shall include excavation, crushed stone bedding, and backfill; furnishing and installing base, invert channels, steps, gaskets, sealants, connections and couplings; and all incidental work necessary to complete the precast or poured in place concrete base as shown on the drawings and as specified herein. The unit price shall also include furnishing and installing the frame and cover/grate, and grouting the frame to the brick courses. Removal and disposal of existing drainage structures shall be considered incidental to the cost of this item. The unit price shall also include delivery of removed frames, covers and grates to a location in the City specified by the Owner.

C. Catch basin hoods shall be measured per hood installed and shall include furnishing and installation of the hood as shown on the drawings and in the specifications. It shall be paid for under the appropriate subdivision of the item Precast Catch Basins, Manholes, and Appurtenances.

D. Hydrodynamic Separator Units shall be measured per unit installed in place. The unit price for this item shall include excavation, crushed stone bedding, and backfill; furnishing and installing unit, steps, gaskets, sealants, connections and couplings; and all incidental work necessary to complete the hydrodynamic separator as shown on the drawings and as specified herein. The unit price shall also include furnishing and installing the frame and cover, and grouting the frame to the brick courses.

1.05 VALVE BOXES:

A. The removal and replacement of valve boxes and coordination with local utility companies shall not be separately measured for payment, but shall be considered incidental to the project.

1.06 CONCRETE SIDEWALK:

A. Cement concrete sidewalk shall be measured per square yard under the appropriate subdivisions of the item Cement Concrete Sidewalk. This subdivision shall include all materials and labor to install

cement concrete sidewalks and the removal and disposal of existing pavement and/or concrete according to the drawings and specifications.

B. Cement concrete wheelchair ramps shall be measured per square yard under the appropriate subdivisions of the item Concrete Sidewalk. This subdivision shall include all materials and labor to install the wheelchair ramp with detectable warning and the removal and disposal of existing pavement according to the drawings and specifications.

C. Payment for cement concrete driveway apron shall be measured per square yard of apron installed in place and will include the removal and disposal of existing pavement, new concrete, keyways, pavement, and gravel or loam pavement backing as required, and as shown on the drawings and in the specifications. It shall be paid under the subdivision Cement Concrete Driveway Apron.

D. Processed gravel subbase for concrete sidewalk, wheel chair ramp, and driveway aprons, shall be measured per cubic yard compacted and in place. It shall be paid for under the appropriate subdivisions of the item Concrete Sidewalk. This subdivision shall include removal and disposal of existing subbase, 6-inches of new gravel, and placement, grading, and compaction of the new gravel according to the drawings and specifications.

E. Raising and adjusting castings:
Raising and adjusting castings shall not be separately measured for payment and shall be considered incidental to the concrete sidewalk.

1.07 SIGNAGE:

A. The removal and replacement of signage shall be measured per sign assembly removed and replaced with new signage complete under the appropriate subdivision of the item Signage. The unit price shall include labor, new sign assembly, and all other materials required for the installation. A sign assembly shall be considered the post or posts, all signs and sign faces mounted to post, and hardware as required to replace sign.

B. The cost of delivering removed signs, posts, and associated City property to a location in the City designated by the Owner shall be considered incidental to the item.

C. Removing and resetting signage, as called out on the drawings, shall be measured per sign assembly removed and reset under the appropriate subdivision of the item Signage. Signs damaged by the contractor during removal and/or storage shall be replaced with new signs at no additional cost to the City.

D. All signage to be replaced and paid under this item shall meet State and City requirements at time of installation.

1.08 CURBING:

A. Granite curbing shall be measured per linear foot of straight, radius, and transition curbing installed complete. It shall be paid under the appropriate subdivision of the item Curbing. The unit cost shall include curbing, compacted subbase, Class 'C' concrete and non-shrink joint mortar as shown on the drawings and as specified.

B. Removing and resetting granite curbing shall be measured per linear foot of straight, radius, and transition curbing installed complete. It shall be paid under the appropriate subdivision of the item

Curbing. The unit cost shall include removing existing curbing, excavation of existing subbase, new compacted subbase, resetting curbing, Class 'C' concrete, and non-shrink joint mortar as shown on the drawings and as specified.

1.09 PAVEMENT REPLACEMENT:

A. Bituminous pavement shall be measured per linear foot, square yard, or ton of work completed, and shall be paid at the contract unit prices under the subdivisions of the item Pavement Replacement as further described below.

B. Pavement disturbed by the Contractor's operations outside payment limits shall not be paid under these subdivisions, but shall be repaired to its original condition by the Contractor at no cost to the Owner.

C. Temporary trench pavement shall be measured per linear foot of trench and shall be paid under the subdivision Temporary Trench Pavement. The use of temporary trench pavement shall be as determined by the Owner or Engineer.

D. Removal and Disposal of existing sidewalk and pavements shall be considered incidental to the project and not separately measured for payment.

E. The reclamation of the existing roadway pavement and subbase shall be measured per square yard as shown on the drawings and as specified. It shall be paid under the appropriate subdivision of Pavement Replacement. It shall include pulverization of the existing pavement and subbase material, and all necessary work to prepare the subbase for grading and compaction. It shall also include the removal and off-site disposal of excess material.

F. Calcium chloride for subbase stabilization shall be measured per gallon of calcium chloride solution applied and incorporated into the subbase material. The unit cost for this item shall include furnishing and applying liquid calcium chloride solution at the defined rate, incorporation of the solution into the reclaimed material as specified, and all other work incidental thereto.

G. Grading and compaction of the roadway base course shall be measured per lump sum complete as shown on the drawings and as specified. It shall be paid under the appropriate subdivision of Pavement Replacement. It shall include the grading and compaction of the new road base course, and all necessary work to prepare the base course for the new binder course of pavement.

H. Binder course pavement shall be measured per ton of pavement installed and shall include the furnishing and installation of binder course pavement as shown on the drawings and as specified. It shall be paid for under the subdivision Binder Course Pavement.

I. Payment for top course pavement shall be measured per ton of pavement installed and shall include the furnishing and installation of top course pavement, keyways, and loam pavement backing as required. It shall be paid under the subdivision Top Course Pavement.

J. Payment for bitumen for tack coat shall be measured per gallon applied. It shall be paid under the subdivision Bitumen for Tack Coat.

K. Payment for bituminous concrete driveways shall be measured per ton of driveway pavement installed and shall include keyways, compacted gravel subbase, and gravel and/or loam backing as required. It shall be paid for under the subdivision bituminous concrete driveway.

L. Payment for hot poured rubberized asphalt sealer shall be measured per linear foot of pavement joint sealed, and shall include all labor and materials necessary to seal asphalt pavement joints as directed by the Engineer.

M. Payment for pavement markings shall be measured per lump sum. It shall be paid under the subdivision Pavement Markings. Pavement markings shall include all pavement markings as shown on the drawings and as specified herein.

N. Additional pavement required for increasing pavement thickness to existing conditions where ordered by the Engineer shall be measured per ton and paid at the contract unit price under the subdivision Additional Pavement.

O. Raising and Adjusting Castings:

1. Raising and adjusting castings shall not be separately measured for payment and shall be considered incidental to paving.

2. Castings shall be raised and adjusted as often as required for winter shut-down and for final top course paving. This shall be considered incidental to paving.

3. New castings installed as part of the contract shall not be measured for payment under this item.

4. Castings owned by private utilities shall be adjusted by their forces at their expense.

1.10 ROCK EXCAVATION AND DISPOSAL:

A. Rock excavation and disposal shall be measured per cubic yard within the trench limits and paid at the contract unit price under the item Rock Excavation and Disposal. Payment shall include replacement of the excavated rock with gravel borrow.

B. Only boulders and concrete structures greater than one cubic yard inside the pay limit area shown on the drawings shall be included for measurement and payment.

C. Where rock is encountered, it shall be uncovered but not excavated until measurements have been made by the Engineer, unless, in the opinion of the Engineer, satisfactory measurements can be made in some other manner.

D. The bidder shall include in the bid for items involving excavation, the cost of doing the entire excavation as earth. The price for the item Rock Excavation and Disposal is intended to cover the difference between the cost of rock excavation and the cost of earth excavation.

E. The cost of pre-blast surveys, if required, shall be considered incidental to the cost of rock excavation and disposal and will not be separately paid.

F. When two or more pipes are installed parallel to one another and the trench payment limits overlap, rock excavation in the overlap section will only be paid once.

1.11 EARTHWORK:

A. Except as designated in Section 1.11, Paragraphs B and C, earthwork shall not be separately measured for payment, but shall be considered incidental to construction of the project.

B. Excavation and backfill of unsuitable material above normal grade:

1. If, in the opinion of the Engineer, the material at or above normal grade is unsuitable for use as backfill, it shall be removed and disposed of to such depths and widths within the limits of payment as he may order. Normal grade is defined as the elevation of the trench bottom, as shown on the drawings.

2. The quantity of excavation and backfill of unsuitable material above normal grade to be included for payment shall be the number of cubic yards of material ordered to be removed and measured by the Engineer within the normal trench limits shown on the contract drawings.

3. Removal of topsoil, paving materials, frozen material or ledge excavation above the normal grade of the trench excavation will not be considered for payment.

4. The unit price for this item shall constitute full compensation for excavation of unsuitable material above normal grade, disposal of unsuitable material and furnishing, installing and compacting approved backfill materials, excluding materials noted in this Section or as specified in Section 02300, EARTHWORK, of the Contract Documents.

5. Payment shall be made at the contract unit price under the subdivision Gravel Fill.

6. The Contractor will not be reimbursed for excavation of unsuitable material above grade, which has not been ordered by the Engineer.

C. Excavation and backfill of unsuitable material below normal grade:

1. If, in the opinion of the Engineer, the material at or below normal grade is unsuitable for use as foundation, it shall be removed and disposed of to such depths and widths as he may order. Normal grade is defined as the elevation of the trench bottom, as shown on the drawings.

2. The quantity of earth excavation and backfill below normal grade to be included for payment shall be the number of cubic yards of material ordered to be removed and measured by the Engineer within the normal trench width shown on the contract drawings.

3. The unit price for excavation and backfill of unsuitable material below normal grade shall constitute full compensation for excavation of unsuitable material below normal grade, disposal of unsuitable material and furnishing, installing and compacting approved backfill materials as specified in Section 02300, EARTHWORK, of the Contract Documents.

4. Payment shall be made at the contract unit price of the subdivision Gravel Fill.

5. The Contractor will not be reimbursed for excavation of unsuitable material below grade, which has not been ordered by the Engineer.

1.12 DUST CONTROL:

A. The work of this section shall not be measured separately for payment, but shall be considered incidental to the project.

1.13 UTILITY POLES:

A. Relocation of existing utility poles shall be measured per pole relocated complete in place, and shall include all required coordination with utility companies, relocation of the existing pole or installation of a new pole and relocation of conductors, removal of old pole, cleanup, and all other work incidental thereto.

1.14 LANDSCAPING:

A. Loaming and seeding shall be measured per lump sum complete. The extent of loaming and seeding required for the project is not indicated on the drawings. The Contractor shall be required to loam and seed all areas disturbed by their forces or their subcontractor's forces. The work of this section shall include furnishing and installing loam and seed as indicated on the drawings and as specified herein, weekly watering of seeded areas for 1 month following seeding, and all work and materials incidental thereto.

B. Removal and disposal of existing trees shall be measured per lump sum complete. The work of this section shall include the professional removal and disposal of the three (3) trees as shown on the drawings and specified herein.

C. Selective trimming of existing trees shall be measured per lump sum complete. The work of this section shall include the professional removal and disposal of all branches projecting into the work area up to a height of 15-feet above grade.

1.15 REPAIR OF EXISTING STREET SIGN MONUMENTS

A. Payment for the repair/restoration of existing street sign monuments shall be measured per lump sum complete, and shall include: washing; labor, mortar, and stone required for re-pointing; decorative precast concrete finial with appropriate street names inset; and all other work and materials incidental thereto.

1.16 ENVIRONMENTAL PROTECTION:

A. Unless otherwise indicated, the work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

B. Inlet protection for catch basins shall be measured per catch basin protected, including maintenance for the duration of the work in the area and removal after final stabilization, and shall be paid at the contract unit price under the item Inlet Protection.

1.17 TRAFFIC SIGNALS:

A. The removal of existing traffic signals shall be measured per lump sum complete. The unit cost for this item shall include the removal of all existing traffic control signals, posts, wiring, appurtenances, and foundations; the salvage and delivery of materials to a City Facility as determined by the Owner; and the disposal of all other materials.

B. Removal replacement of loop detectors shall be measured per lump sum complete. The unit cost for this item shall include removal of the existing loop detector wiring, saw cut and installation of new wiring, connection and integration into the existing system, and all other work and materials incidental thereto.

1.18 TRAFFIC CONTROL:

A. The services of uniformed officers shall be measured per hour worked and paid at the contract unit prices under the subdivision Maintenance and Protection of Traffic. The unit prices under this subdivision include administration charges required by the police.

B. The set prices for Uniformed Officers are based on the prevailing hourly wage rates. Payment will be made based on invoices submitted by the City of New London Police Department to the Contractor. The Contractor shall forward copies of these invoices to the Engineer and include the cost in his Application for Payment. Actual payment to the City of New London Police Department shall be made by the Contractor and the Contractor shall be reimbursed by the Owner through the payment estimate. If police wages change during the course of the Contract, the unit prices under this subdivision will be changed accordingly.

C. Traffic control shall be measured as a lump sum and paid at the contract unit price under the subdivision Maintenance and Protection of Traffic. Traffic control shall include all signage, flagmen, warning devices, and all other means to protect traffic from the work site as directed by the Owner and as shown in the specifications.

1.19 SUPPORT OF EXCAVATION:

A. Unless otherwise indicated, the work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.20 DEWATERING:

Unless otherwise indicated, the work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.21 CONNECTIONS TO EXISTING STORM DRAINS:

Unless otherwise indicated, the work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.22 FIELD CONCRETE:

Unless otherwise indicated, the work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.23 RECONSTRUCTION OF EXISTING SEWERS AND DRAINS:

Reconstruction of existing sewers and drains damaged by the Contractor shall not be separately measured for payment, but shall be considered incidental to the project.

1.24 SIDEWALK & CURBING REPAIR:

Unless otherwise indicated, the work of this section, including the repair of concrete sidewalks and the repair of curbing sections using bituminous concrete, shall not be separately measured for payment, but shall be considered incidental to the project.

1.25 PEDESTRIAN SAFETY:

Labor and materials required for the protection of pedestrian traffic from excavations and construction activities, such as: construction fence, steel plating, flagmen, flashing barrels, etc., shall not be separately measured for payment, but shall be considered incidental to the project.

END OF SECTION

SECTION 01400

QUALITY REQUIREMENTS

## PART 1 - GENERAL

### 1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of the responsibility for compliance with the Contract Document requirements.

B. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.

C. Requirements for Contractor to provide quality-assurance and -control services required by Engineer, Owner or authorities having jurisdiction are not limited by provisions of this Section.

### 1.2 RELATED WORK

A. Section 00890, PERMITS

B. Section 02300, EARTHWORK

C. Section 03302, FIELD CONCRETE

### 1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Engineer.

C. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

D. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

E. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

F. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

H. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

1.4 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Engineer for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Engineer for a decision before proceeding.

1.5 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
5. Other required items indicated in individual Specification Sections.

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

1.6 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

F. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

G. Manufacturer's Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

## 1.7 QUALITY CONTROL

A. Contractor Responsibilities: Perform quality-control activities required to verify that the Work complies with requirements, whether specified or not.
   1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
   2. Notify testing agencies at least twenty-four (24) hours in advance of time when Work that requires testing or inspecting will be performed.
   3. Submit a certified written report, in duplicate, of each quality-control service.
   4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
   5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

B. Testing Agency Responsibilities: Cooperate with Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

   1. Notify Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
   2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
   3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
   4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
   5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
   6. Do not perform any duties of Contractor.

C. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

   1. Access to the Work.
   2. Incidental labor and facilities necessary to facilitate tests and inspections.
   3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
   4. Facilities for storage and field curing of test samples.
   5. Delivery of samples to testing agencies.
   6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
   7. Security and protection for samples and for testing and inspecting equipment at Project site.

D. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

   1. Schedule times for tests, inspections, obtaining samples, and similar activities.

E. Schedule of Testing:

1. Earthwork:

Testing will be performed by a certified inspection laboratory engaged and paid for by the Contractor. If test results indicate work does not conform to specification requirements, the Contractor shall remove or correct the defective Work by recompacting where appropriate or replacing as necessary and approved by the Engineer, to bring the work into compliance, at no additional cost to the Owner. All backfilled materials under structures and buildings shall be field tested for compliance with the requirements of the Contract Documents.

| | |
|---|---|
| 1. Aggregate Base for Pavement | *Perform sieve tests (ASTM D422 & D1140) and modified Proctor tests (ASTM D1557) of each source of base material. Frequency: periodic, once for each source minimum and every six months.*<br><br>*Inspect removal of unsuitable material and preparation of subgrade prior to placement of controlled fill. Frequency: continuous observation*<br><br>*Inspect placement, lift thickness and compaction of material. Frequency: continuous, test each lift every 1000 square feet with two tests minimum per lift*<br><br>*Test density of each lift of fill by nuclear methods (ASTM D2922) to achieve 95% maximum density.* |

1. Bituminous Concrete Pavement:

Testing will be performed by a certified inspection laboratory engaged and paid for by the Contractor. If test results indicate work does not conform to specification requirements, the Contractor shall remove or correct the defective Work by recompacting where appropriate or replacing as necessary and approved by the Engineer, to bring the work into compliance, at no additional cost to the Owner. All materials shall be field tested for compliance with the requirements of the Contract Documents.

| | |
|---|---|
| Bituminous Concrete Pavement | *Determine theoretical density of material (AASHTO 166 or other acceptable method). Frequency: periodic, once for each course of pavement.*<br><br>*Inspect placement, course thickness and compaction of material. Frequency: continuous, test each course using a stratified random sampling method (ASTM D3665) with a maximum sublot length of 50 feet.*<br><br>*Test density of each lift of fill by nuclear methods (ASTM D2950) to achieve 92% to 97% maximum density.* |

2. Cast-in-Place Concrete:

The Contractor shall engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

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|---|---|
| 1. Mix Design | *Review concrete batch tickets and verify compliance with approved mix design. Verify that water added at the site does not exceed that allowed by the mix design. Frequency: continuous for each delivery during all concrete placement* |
| 2. Reinforcement Installation | *Inspect size, spacing, cover, positioning and grade of reinforcing steel. Verify that reinforcing bars are free of form oil or other deleterious materials. Inspect bar laps and mechanical splices. Verify that bars are adequately tied and supported on chairs or bolsters. Frequency: periodic for all reinforcing* |
| 3. Concrete Placement | *Inspect placement of concrete. Verify that concrete conveyance and depositing avoids segregation or contamination. Verify that concrete is properly consolidated. Frequency: continuous during all concrete placement* |
| 4. Sampling and Testing of Concrete | *Test concrete compressive strength (ASTM C31 & C39), slump (ASTM C143), air-content (ASTM C231 or C173) and temperature (ASTM C1064). Frequency: 1 tested sample per 50 cy, minimum 1 per day.* |
| 5. Curing and Protection | *Inspect curing, cold weather protection and hot weather protection procedures. Frequency: periodic daily for one week during curing, periodic daily for duration of other procedures* |

a. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

b. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer. The costs associated with additional testing will not be considered for additional payment.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION**

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Engineer.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Engineer's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 03302

FIELD CONCRETE

## PART 1 - GENERAL

1.1 WORK INCLUDED

This Section covers concrete and all related items necessary to place and finish the concrete work.

1.2 RELATED WORK

A. Section 02300, EARTHWORK

B. Section 02631, PRECAST MANHOLES AND CATCH BASINS

1.3 REFERENCES

A. The following standards form a part of this specification:

American Concrete Institute (ACI)

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|---|---|
| ACI 304 | Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete |
| ACI 305 | Recommended Practice for Hot Weather Concreting |
| ACI 306 | Recommended Practice for Cold Weather Concreting |
| ACI SP-66ACI | Detailing Manual |
| ACI 318 | Building Code Requirements for Reinforced Concrete |

American Society for Testing and Materials (ASTM)

| | |
|---|---|
| ASTM A615 | Deformed and Plain Billet-Steel Bars for Concrete Reinforcement |
| ASTM C33 | Concrete Aggregates |
| ASTM C94 | Ready-Mixed Concrete |
| ASTM C143 | Test for Slump of Portland Cement Concrete |
| ASTM C150 | Portland Cement |
| ASTM C260 | Air Entraining Admixtures for Concrete |
| ASTM C494 | Chemical Admixtures for Concrete |

1.4 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Statement of materials constituting the design of mixes for each size aggregate as required by ASTM C94 shall be submitted to the Engineer within one week following award of the Contract.

**PART 2 - PRODUCTS**

2.1 CONCRETE

A. All concrete, reinforced or nonreinforced shall have a 28-day compressive strength of 3,000 psi unless otherwise noted on the design drawings. A minimum of 5.5 sacks of cement per cubic yard and a maximum water cement ratio of 6.9 gallons per sack shall be used.

B. Concrete shall conform to ASTM C94. The Contractor shall be responsible for the design of the concrete mixtures. Slump shall be a maximum of 4-inches and a minimum of 2-inches, determined in accordance with ASTM C143.

C. Admixtures shall be as specified in subsection 2.5. No additional admixtures shall be used unless approved by the Engineer.

D. No additional water, except for the amount indicated by the design mix shall be added to the concrete without the prior permission of the Engineer.

2.2 REINFORCING

Reinforcing as shown on the plans or as directed by the Engineer, shall conform to ACI 318 and ASTM A615 and shall be detailed in accordance with ACI SP-66. All Steel reinforcing bars shall be grade 60.

2.3 CEMENT

The cement shall be an approved brand of American manufactured Portland Cement, Type II conforming to the applicable requirements of ASTM C150.

2.4 AGGREGATES

A. Except as otherwise noted, aggregate shall conform to the requirements of ASTM C33.

B. Maximum size aggregate shall be ¾-inch.

2.5 ADMIXTURES

A. All concrete (unless otherwise directed) shall contain an air entraining agent. Air entrained concrete shall have air content by volume of 4 to 8 percent for ¾-inch aggregate.

B. Air entraining agent shall be in accordance with ASTM C260 and shall be Darex AEA, as manufactured by W.R. Grace & Company; Placewel (air entraining Type), as manufactured

by Johns Manville; Sika AER as manufactured by Sika Chemical Company; or an approved equal product.

C. Water reducing agent shall be WRDA, as manufactured by W.R Grace & Company; Placewel (non-air entraining Type), as manufactured by Johns Manville; Sika Plastiment as manufactured by Sika Chemical Company; or an approved equal product.

D. Water reducing agent-retarder shall be "Daratard," as manufactured by W.R. Grace & Company; Sika Plastiment as manufactured by Sika Chemical Company; or an approved equal product.

2.6 WATER

Water for concrete shall be potable, free of deleterious amounts of oil, acid, alkali, organic matter and other deleterious substances.

## PART 3 - EXECUTION

3.1 PREPARATION

A. Before placing concrete, forms and the space to be occupied by the concrete shall be thoroughly cleaned, and reinforcing steel and embedded metal shall be free from dirt, oil, mill scale, loose rust, paint or the material which would tend to reduce the bond.

B. Earth, concrete, masonry, or other water permeable material against which concrete is to be placed shall be thoroughly saturated with water immediately before concrete is placed.

C. No concrete shall be placed until the consolidation of the ground and the arrangement and details of forms and reinforcing have been inspected and approved by the Engineer.

3.2 FILL CONCRETE

A. Fill concrete shall be placed in those locations as indicated on the design drawings. Fill concrete shall consist of materials as previously specified, with a minimum 28-day compressive strength of 3,000 psi.

B. Before fill concrete is placed, the following procedures shall be used to prepare surfaces; all dirt, scum and laitance shall be removed by chipping and washing. The clean, roughened base surface shall be saturated with water, but shall have no free water on the surface. A coat of 1:2 cement-sand grout, approximately 1/8-inch thick, shall be well scrubbed into the thoroughly dampened concrete base. The concrete fill shall be placed immediately, before grout has dried or set.

C. Fill concrete shall be brought to lines and grades as shown on the design drawings.

## 3.3 CONCRETE PLACING DURING COLD WEATHER

A. Concrete shall not be placed on frozen ground, and no frozen material or material containing ice shall be used. Materials for concrete shall be heated when temperature is below 40°F, or is expected to fall to below 40°F, within 73 hours, and the concrete after placing shall be protected by covering, heat, or both.

B. All details of Contractor's handling and protecting of concrete during freezing weather shall be subject to the approval and direction of the Engineer. All procedures shall be in accordance with provisions of ACI 306.

## 3.4 CONCRETE PLACING DURING HOT WEATHER

A. Concrete just placed shall be protected from the direct rays of the sun and the forms and reinforcement just prior to placing, shall be sprinkled with cold water. The Contractor shall make every effort to minimize delays which will result in excessive mixing of the concrete after arrival on the job.

B. During periods of excessively hot weather (90°F or above), ingredients in the concrete shall be cooled insofar as possible and cold mixing water shall be used to maintain the temperature of the concrete at permissible levels all in accordance with the provisions of ACI 305. Any concrete with a temperature above 90°F, when ready for placement, will not be acceptable, and will be rejected.

## 3.5 FIELD QUALITY CONTROL

A. Concrete inspection and testing shall be performed by an inspection laboratory, approved by the Engineer, engaged and paid for by the Contractor. Testing equipment shall be supplied by the laboratory, and the preparation of samples and all testing shall be performed by the laboratory personnel. Full assistance and cooperation, concrete for samples, and such auxiliary personnel and equipment as needed shall be provided by the Contractor.

B. At least 4 standard compression test cylinders shall be made and tested and 1 slump test from each day's placement of concrete. A minimum of four compression test cylinders shall be made and tested for each 50 cubic yards of each type and design strength of concrete placed. One cylinder shall be tested at 7 days, and two at 28 days. The fourth cylinder from each set shall be kept until the 28 day test report on the second and third cylinders in the same set has been received. if the average compressive strength of the two 28 day cylinders do not achieve the required level, the Engineer may elect to test the fourth cylinder immediately or test it after 56 days. If job experience indicates additional cylinder tests or other tests are required for proper control or determination of concrete quality, such tests shall be made.

C. The Engineer shall have the right to reject concrete represented by low strength tests. Rejected concrete shall be promptly removed and replaced with concrete conforming to the specification. The decision of the Engineer as to whether substandard concrete is to be accepted or rejected shall be final.

END OF SECTION