

CITY COUNCIL AGENDA ITEM COVER MEMO

Agenda Item Number _____

Meeting Type: Regular

Meeting Date: 2/13/2014

Action Requested By:
Water Pollution
Control

Agenda Item Type
Resolution

Subject Matter:

Agreement with Reed Contracting Services, Inc.

Exact Wording for the Agenda:

Resolution authorizing the Mayor to enter into an agreement with the low bidder, Reed Contracting Services, Inc., for WPC Sanitary Sewer Relocation-County Line Road & I-565, Project No. 65-12-SM01 & IM-1565(307)

Note: If amendment, please state title and number of the original

Item to be considered for: Action

Unanimous Consent Required: No

Briefly state why the action is required; why it is recommended; what Council action will provide, allow and accomplish and; any other information that might be helpful.

This agreement is for the Sanitary Sewer Relocation project at County Line Road and I-565 interchange for a total contract amount of \$978,093.32. Account No. 02-6500-0811-1349

Associated Cost: \$978,093.32

Budgeted Item: Select...

MAYOR RECOMMENDS OR CONCURS: Select...

pk

Department Head: *[Signature]*

Date: 2/5/14

ROUTING SLIP CONTRACTS AND AGREEMENTS

Originating Department: **Water Pollution Control** Council Meeting Date: **2/13/2014**

Department Contact: **Shane Cook**

Phone # **256-883-3719**

Contract or Agreement: **Construction Contract**

Document Name: **WPC SS Relocation-Project No. 65-12-SM01 & IM-I565(307)**

City Obligation Amount: **\$978,093.32**

Total Project Budget: **\$978,093.32**

Uncommitted Account Balance: **0**

Account Number: **02-6500-0811-1349**

Procurement Agreements

<u>Title 39</u>	<u>Competitive</u>
------------------------	---------------------------

Grant-Funded Agreements

<u>Not Applicable</u>	Grant Name:
------------------------------	--------------------

Department	Signature	Date
1) Originating	<i>[Signature]</i>	2/5/14
2) Legal	<i>[Signature]</i>	2/5/14
3) Finance	<i>[Signature]</i>	2/6/14
4) Originating		
5) Copy Distribution		
a. Mayor's office (1 copies)		
b. Clerk-Treasurer (Original & 2 copies)		

RESOLUTION NO. 14- _____

BE IT RESOLVED by the City Council of the City of Huntsville, Alabama, that the Mayor be, and is hereby authorized, to enter into a contract with the low bidder, Reed Contracting Services, Inc., in the amount of NINE HUNDRED SEVENTY-EIGHT THOUSAND NINETY-THREE AND .32/100 DOLLARS (\$978,093.32) for WPC Sanitary Sewer Relocation-County Line Road & I-565, Project No. 65-12-SM01 & ALDOT Project No. IM-I565(307), in Huntsville, Alabama, on behalf of the City of Huntsville, a municipal corporation in the State of Alabama, which said agreement is substantially in words and figures similar to that document attached hereto and identified as "Contract between City of Huntsville and Reed Contracting Services, Inc. for WPC Sanitary Sewer Relocation-County Line Road & I-565, Project No. 65-12-SM01 & ALDOT Project No. IM-I565(307)" consisting of a total of one (1) page plus three hundred and five (305) additional pages consisting of Attachments A1-H, Supplement to General Requirements for Construction of Public Improvements and all Addenda, "Certification of Compliance with Title 39, Code of Alabama", and "E-Verify Statement", and the date of February 13, 2014, appearing on the margin of the first page, together with the signature of the President or President Pro Tem of the City Council, and an executed copy of said document being permanently kept on file in the Office of the City Clerk of the City of Huntsville, Alabama.

ADOPTED this the 13th day of February, 2014.

President of the City Council of
the City of Huntsville, Alabama

APPROVED this the 13th day of February, 2014.

Mayor of the City of Huntsville,
Alabama

**CONTRACT BETWEEN CITY OF HUNTSVILLE
AND
REED CONTRACTING SERVICES, INC.
FOR**

**WPC SANITARY SEWER RELOCATION-COUNTY LINE ROAD & I-565
PROJECT NO. 65-12-SM01 & ALDOT PROJECT NO. IM-1565(307)**

~~~~~  
**STATE OF ALABAMA}  
MADISON COUNTY}**

THIS CONTRACT, made and entered into this 13th day of February, 2014, between the CITY OF HUNTSVILLE, ALABAMA, a Municipal Corporation, sometimes referred to herein as City, and REED CONTRACTING SERVICES, INC., sometimes referred to herein as Contractor.

**-WITNESSETH-**

WHEREAS, the City desires to install, construct or make certain improvements known as WPC Sanitary Sewer Relocation-County Line Road & I-565, Project #65-12-SM01 & ALDOT Project No. IM-I565(307), in the City of Huntsville, Madison County, Alabama, all in accordance with details, specifications, surveys and general requirements prepared by the City of Huntsville Urban Development Department - Engineering Division, which are on file in the Office of the City Engineer of the City of Huntsville, Alabama, all of which details, specifications, surveys and general requirements are made a part of this contract, and

NOW, THEREFORE, it is agreed that the Contractor promises and agrees to make such improvements for the party of the first part for the considerations hereinafter set out. The Contractor promises and agrees to furnish all necessary labor, materials and equipment for the doing of the same, all to be done in accordance with such details, plans, specifications and general requirements hereto attached and made a part of this contract.

FOR THE PERFORMANCE of such work, the City agrees to pay the Contractor as follows per Attachment "A1".

  
\_\_\_\_\_  
Reed Contracting Services, Inc.

BY:

\_\_\_\_\_  
Tommy Battle, Mayor

ATTEST: 

\_\_\_\_\_  
Charles E. Hagood  
City Clerk Treasurer

\_\_\_\_\_  
Mark Russell  
City Council President

DATE: February 13, 2014

**CITY OF HUNTSVILLE  
LIMESTONE COUNTY, ALABAMA**

**WPC SANITARY SEWER RELOCATION  
COUNTY LINE ROAD & I-565**

**January 2014**

**City of Huntsville Project No. 65-12-SM01  
ALDOT Project No. IM565 (307)**



**CITY OF HUNTSVILLE**  
**COUNTY LINE ROAD & I-565 SANITARY SEWER RELOCATION**

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**PLEASE NOTE:**

THE SPECIFICATIONS LISTED BELOW ARE IN ADDITION TO THE CURRENT, LATEST REVISIONS OF THE CITY OF HUNTSVILLE, ENGINEERING DEPARTMENT, STANDARD SPECIFICATIONS FOR CONSTRUCTION OF SANITARY SEWERS, THE DESIGN AND ACCEPTANCE MANUAL FOR FORCE MAINS AND PUMP STATIONS, AS WELL AS ANY OTHER PUBLISHED CITY OF HUNTSVILLE STANDARDS.

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CITY OF HUNTSVILLE SUPPLEMENT TO GENERAL REQUIREMENTS FOR CONSTRUCTION OF PUBLIC IMPROVEMENTS

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**COUNTY LINE ROAD & I-565**

**COH PROJ. NO. 65-12-SM01 & ALDOT PROJ. NO. IM-1565(307)**

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|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------|----------------|-------------|----------|--|
| COUNTY LINE ROAD & I-565 SANITARY SEWER RELOCATION |                                                                                                                                                    |         |          |                |             |          |  |
| PROJECT NOS. 65-12-SM01 & ALDOT NO. IM-1565(307)   |                                                                                                                                                    |         |          |                |             |          |  |
| ITEM NO.                                           | DESCRIPTION                                                                                                                                        | BID QTY | BID UNIT | BID UNIT PRICE | BID AMOUNT  |          |  |
| 1                                                  | Mobilization, Demobilization, Bonds, Insurance, Including Clearing and Grubbing and Traffic Control (Not to Exceed 5% of the Total Base Bid Price) | 1       | LS       | \$41,234.56    | \$41,234.56 | ✓        |  |
| 2                                                  | Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 0' to 6' deep, Complete In-Place PER C.O.H. SPECIFICATION #646, #647, & #648                | 1       | EA       | \$3,053.90     | \$3,053.90  | ✓        |  |
| 3                                                  | Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 6' to 12' deep, Complete In-Place PER C.O.H. SPECIFICATION #646, #647, & #648               | 4       | EA       | \$3,370.90     | \$13,483.60 | ✓        |  |
| 4                                                  | Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 12' to 18' deep, Complete In-Place PER C.O.H. SPECIFICATION #646, #647, & #648              | 1       | EA       | \$4,126.08     | \$4,126.08  | ✓        |  |
| 5                                                  | Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 18' to 24' deep, Complete In-Place PER C.O.H. SPECIFICATION #646, #647, & #648              | 6       | EA       | \$5,423.10     | \$32,538.60 | ✓        |  |
| 6                                                  | Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 24' to 30' deep, Complete In-Place PER C.O.H. SPECIFICATION #646, #647, & #648              | 2       | EA       | \$6,486.22     | \$12,932.44 | ✓        |  |
| 7                                                  | Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 30' to 36' deep, Complete In-Place PER C.O.H. SPECIFICATION #646, #647, & #648              | 3       | EA       | \$7,118.02     | \$21,354.06 | ✓        |  |
| 8                                                  | Watertight Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 6' to 12' deep, Complete In-Place PER C.O.H. SPECIFICATION #646, #647, & #648    | 1       | EA       | \$3,826.71     | \$3,826.71  | ✓        |  |

| ATTACHMENT A-1                                     |                                                                                                                                                                                                                   |         |          |                |              | 2/3/2014 |  |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------|----------------|--------------|----------|--|
| COUNTY LINE ROAD & I-565 SANITARY SEWER RELOCATION |                                                                                                                                                                                                                   |         |          |                |              |          |  |
| PROJECT NOS. 65-12-SM01 & ALDOT NO. IM-1565(307)   |                                                                                                                                                                                                                   |         |          |                |              |          |  |
| ITEM NO.                                           | DESCRIPTION                                                                                                                                                                                                       | BID QTY | BID UNIT | BID UNIT PRICE | BID AMOUNT   |          |  |
| 9                                                  | Watertight with Vent Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 6' to 12' deep, Complete In-Place PER C.O.H. SPECIFICATION #646, #647, & #648                                                         | 2       | EA       | \$6,420.86     | \$12,841.72  | ✓        |  |
| 10                                                 | 16-Inch Class 350 DIP Gravity Sewer and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included (Depth of Cover 10 feet or less) PER C.O.H. SPECIFICATION #645, #646, #647, & #648    | 1,571   | LF       | \$21.78        | \$34,216.38  | ✓        |  |
| 11                                                 | 16-Inch Class 350 DIP Gravity Sewer and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included (Depth of Cover 10 feet to 20 feet) PER C.O.H. SPECIFICATION #645, #646, #647, & #648 | 1,426   | LF       | \$96.93        | \$138,222.18 | ✓        |  |
| 12                                                 | 16-Inch Class 350 DIP Gravity Sewer and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included (Depth of Cover 20 feet to 30 feet) PER C.O.H. SPECIFICATION #645, #646, #647, & #648 | 2,948   | LF       | \$94.34        | \$278,114.32 | ✓        |  |
| 13                                                 | 16-Inch Class 350 DIP Gravity Sewer and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included (Depth of Cover 30 feet to 40 feet) PER C.O.H. SPECIFICATION #645, #646, #647, & #648 | 1,126   | LF       | \$87.97        | \$99,054.22  | ✓        |  |
| 14                                                 | Inside Drop Manhole Connection to Existing Sanitary Sewer Manhole                                                                                                                                                 | 1       | EA       | \$5,703.36     | \$5,703.36   | ✓        |  |
| 15                                                 | Connection to Existing Sanitary Sewer Manhole                                                                                                                                                                     | 1       | EA       | \$1,284.57     | \$1,284.57   | ✓        |  |

| ATTACHMENT A-1                                     |                                                                                                                                                               |         |          |                |             |   | 2/3/2014 |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------|----------------|-------------|---|----------|
| COUNTY LINE ROAD & I-565 SANITARY SEWER RELOCATION |                                                                                                                                                               |         |          |                |             |   |          |
| PROJECT NOS. 65-12-SM01 & ALDOT NO. IM-1565(307)   |                                                                                                                                                               |         |          |                |             |   |          |
| ITEM NO.                                           | DESCRIPTION                                                                                                                                                   | BID QTY | BID UNIT | BID UNIT PRICE | BID AMOUNT  |   |          |
| 16                                                 | 18-Inch Class 250 Forcemain and Required Appurtenances (Installation only of Owner-Furnished Pipe) Piping Appurtenances and Bedding Included                  | 1,653   | LF       | \$18.78        | \$31,043.34 | ✓ |          |
| 17                                                 | 18-Inch Class 250 Restrained Joint Forcemain and Required Appurtenances (Installation only of Owner-Furnished Pipe) Piping Appurtenances and Bedding Included | 280     | LF       | \$20.42        | \$5,717.60  | ✓ |          |
| 18                                                 | 18-Inch Gate Valve and Required Appurtenances                                                                                                                 | 1       | EA       | \$9,910.73     | \$9,910.73  | ✓ |          |
| 19                                                 | 18-Inch DIP-RJ 11 1/4 Degree Bend, Thrust Block and Required Appurtenances                                                                                    | 1       | EA       | \$2,442.04     | \$2,442.04  | ✓ |          |
| 20                                                 | 18-Inch DIP-RJ 45 Degree Bend, Thrust Block and Required Appurtenances                                                                                        | 4       | EA       | \$1,995.89     | \$7,983.56  | ✓ |          |
| 21                                                 | Connection to Existing 18-Inch DIP Forcemain                                                                                                                  | 2       | EA       | \$2,572.21     | \$5,144.42  | ✓ |          |
| 22                                                 | Site Restoration to include grading, topsoil, and preparation for seed on all disturbed areas.                                                                | 11      | AC       | \$2,113.80     | \$23,251.80 | ✓ |          |
| 23                                                 | Temporary and Permanent Grassing                                                                                                                              | 22      | AC       | \$1,365.34     | \$30,037.48 | ✓ |          |

| ATTACHMENT A-1                                     |                                                                                                                                                                   |         |          |                |               |  | 2/3/2014 |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------|----------------|---------------|--|----------|
| COUNTY LINE ROAD & I-565 SANITARY SEWER RELOCATION |                                                                                                                                                                   |         |          |                |               |  |          |
| PROJECT NOS. 65-12-SM01 & ALDOT NO. IM-1565(307)   |                                                                                                                                                                   |         |          |                |               |  |          |
| ITEM NO.                                           | DESCRIPTION                                                                                                                                                       | BID QTY | BID UNIT | BID UNIT PRICE | BID AMOUNT    |  |          |
| 24                                                 | Class II Rip-Rap Replacement                                                                                                                                      | 300     | TON      | \$26.49        | \$7,947.00 ✓  |  |          |
| 25                                                 | Silt Fencing                                                                                                                                                      | 8,944   | LF       | \$3.17         | \$28,352.48 ✓ |  |          |
| 26                                                 | Additional Erosion Control per Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas, March 2009 | 1       | LS       | \$4,120.81     | \$4,120.81 ✓  |  |          |
| 27                                                 | Open Cut Creek Crossing (Including Concrete Encasement)                                                                                                           | 1       | LS       | \$3,970.55     | \$3,970.55 ✓  |  |          |
| 28                                                 | 30-Inch Steel Encasement Jack and Bore Installation (w/ 90 LF 18-Inch CL 250 DIP-RJ)                                                                              | 90      | LF       | \$225.05       | \$20,254.50 ✓ |  |          |
| 29                                                 | Remove and Replace Existing Gravel Drive                                                                                                                          | 500     | TON      | \$16.59        | \$8,295.00 ✓  |  |          |
| 30                                                 | Vacuum Testing for Manhole (Material and Installation)                                                                                                            | 20      | EA       | \$231.77       | \$4,635.40 ✓  |  |          |
| 31                                                 | Abandon Sanitary Sewer Line at County Line Road Pump Station                                                                                                      | 21      | LF       | \$22.15        | \$465.15 ✓    |  |          |

| ATTACHMENT A-1                                                                                                                                 |                                                | 2/13/2014 |                     |
|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------|---------------------|
| COUNTY LINE ROAD & I-565 SANITARY SEWER RELOCATION                                                                                             |                                                |           |                     |
| PROJECT NOS. 65-12-SM01 & ALDOT NO. IM-1565(307)                                                                                               |                                                |           |                     |
| ITEM NO.                                                                                                                                       | DESCRIPTION                                    | BID QTY   | BID UNIT PRICE      |
| 32                                                                                                                                             | Sewer Line Testing (Material and Installation) | 7,071     | LF \$1.74           |
| 33                                                                                                                                             | Forcemain Testing (Material and Installation)  | 1,873     | LF \$2.19           |
| 34                                                                                                                                             | Digital As-Built Drawings                      | 1         | LS \$6,129.35       |
| 35                                                                                                                                             | Aid to Construction: Utility Relocation        | 1         | LS \$50,000.00      |
| 36                                                                                                                                             | Reimbursement for Crop Damage                  | 1         | LS \$10,000.00      |
| <b>TOTAL BASE BID AMOUNT</b>                                                                                                                   |                                                |           | <b>\$978,093.32</b> |
| Company <i>Reed Contracting &amp; P&amp;S, Inc</i><br>Signature _____<br>Date <i>2-9-14</i>                                                    |                                                |           |                     |
| <b>ALL ITEMS SHALL BE CONSIDERED IN-PLACE. UNIT PRICE SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT AND REMOVAL REQUIRED FOR CONSTRUCTION.</b> |                                                |           |                     |

**ATTACHMENT "B"**  
**PROPOSAL**

**TO: THE CITY OF HUNTSVILLE**

Public Services Building  
320 Fountain Circle  
Huntsville, Alabama

**PROPOSAL OF** Reed Contracting Services, Inc

(NAME)

2512 Triana Blvd, SW, Huntsville AL 35805  
(ADDRESS)

**TO MAKE CERTAIN IMPROVEMENTS ENTITLED:**

**WPC SANITARY SEWER RELOCATION  
COUNTY LINE ROAD & I-565  
COH PROJ. NO. 65-12-SM01 & ALDOT PROJ. NO. IM-1565(307)**

**FOR THE CITY OF HUNTSVILLE, ALABAMA.**

**GENTLEMEN:**

The undersigned bidder has carefully examined the drawings or plans, bid documents, the specifications, the general requirements, the supplement to general requirements, the general terms and conditions, this proposal, the agreement, together with any addenda thereto, and agrees to furnish and deliver all the materials, and to do and perform all the work and labor required to be furnished and delivered, done and performed in and about the improvements as described above and in accordance with certain specifications prepared and approved by the OWNER (City of Huntsville, Alabama). It is **MANDATORY** that any and all addenda be acknowledged by the undersigned bidder, either on page 2 of the Proposal, Attachment "B" or on the outside of the envelope, otherwise, bid shall be rejected.

The undersigned bidder understands that when unit prices are called for, the quantities shown herein are approximate only and are subject to increase or decrease, and offers to do the work whether the quantities are increased, or decreased, at the unit prices stated in the following schedule. The undersigned bidder also understands that when lump sum bids are called for, he will be required to furnish all equipment, labor, materials and other items or cost to construct a complete facility. The undersigned bidder further understands that any deletions or additions designated on the outside of the bid envelope, must indicate the particular bid item relative to the deletion or addition, even if the deletion or addition references to deduct or add to the Total Base Bid.

Contractors are authorized to download quantities, Attachment "A", or quantity revisions from COH Engineering website and paste to 3 1/2" floppy disk or CD of their choice; one or the other must be submitted with the original bid packet. In addition, two hard copies must be signed and submitted with original bid packet.

Certificates of insurance are required naming the City as the Certificate Holder. Also, the name of the project and project number should be included on the certificate. The Certificate should reflect the insurance coverage required herein. In addition, a copy of the policy may be requested upon award. The Certificates are to be signed by a person authorized by the insurer to bind coverage on its behalf and must indicate coverage will not be canceled or non-renewed except after thirty (30) days prior written notice to the City at the following address: City of Huntsville, P.O. Box 308, Huntsville, Alabama 35804 ATTN: Penny Kelly.

The undersigned bidder understands that the Contract Time for completion of all work is One Hundred and Twenty (120) calendar days.

**THE UNDERSIGNED BIDDER ALSO AGREES AS FOLLOWS:**

All bonds must be approved by the Mayor and the Clerk-Treasurer of the City of Huntsville. Within fifteen (15) days after the date of acceptance of this proposal by City Council action, the contractor shall execute the contract and furnish to the OWNER a payment (labor and material) bond and a performance bond, each in the amount of 100% of the contract amount. No contract extension will be allowed for delays in the issuance of the notice to proceed that are a result of the contractor failing to submit the required items within the 15 days.

**WPC SANITARY SEWER RELOCATION  
COUNTY LINE ROAD & I-565  
COH PROJ. NO. 85-12-SM01 & ALDOT PROJ. NO. IM-1565(307)**

It is further understood and agreed that the Contractor shall commence work to be performed under this contract within fifteen (15) days from the date of this contract, unless otherwise instructed in writing by the OWNER. All work shall be carried on continuously to completion.

Accompanying this proposal is a certified check or bid bond in the amount of not less than five percent (5%) of the total amount shown on the schedule of prices not exceeding \$10,000.00 payable to the City of Huntsville, Alabama, which is to be forfeited, as liquidated damages, if, in the event that his proposal is accepted, the undersigned shall fail to execute the contract and furnish a satisfactory contract bond under the conditions and within the time specified in this proposal; otherwise, said certified check or bid bond is to be returned to the undersigned.

DATED: February 4, 20 14,

(IF AN INDIVIDUAL, PARTNERSHIP, OR NON-INCORPORATED ORGANIZATION)  
SIGNATURE OF BIDDER \_\_\_\_\_

BY Reed Contracting Services, Inc.

ADDRESS OF BIDDER \_\_\_\_\_

NAMES AND ADDRESSES OF MEMBERS OF THE FIRM:  
\_\_\_\_\_  
\_\_\_\_\_

OUR CONTRACTOR'S STATE LICENSE NO. IS 20545

(IF A CORPORATION)  
SIGNATURE OF BIDDER 

BY David L. Harris, Vice President

BUSINESS ADDRESS 2512 Triana Blvd SW, Huntsville AL 35805

INCORPORATED UNDER THE LAWS OF THE STATE OF Alabama

NAMES PRESIDENT Michael Reed

OF SECRETARY David L. Harris, Vice President

OFFICERS TREASURER Charles C. Lovoy, Secretary

**MANDATORY ACKNOWLEDGEMENT OF ADDENDA:** Addenda will only be faxed to those bidders who attend and have signed in at the pre-bid meeting. It is the responsibility of all bidders to refer to the website for any updates.

Addendum # 1 Jan 21, 2014    Addendum # 2 Jan 27, 2014    Addendum # 2 Jan 29, 2014

**ATTACHMENT "C"**

**WPC SANITARY SEWER RELOCATION  
COUNTY LINE ROAD & I-565  
COH PROJ. NO. 85-12-SM01 & ALDOT PROJ. NO. IM-1565(307)**

**SUBCONTRACTOR'S LISTING**

All subcontractors must be approved in writing by Owner. If subcontractors are not approved, Contractor will be notified prior to approval of contract by City Council. Any additional subcontractors needed during the contract period shall be approved by written letter from the Owner. Contractor shall immediately notify Mary Hollingsworth via email at [mary.hollingsworth@huntsvilleal.gov](mailto:mary.hollingsworth@huntsvilleal.gov) and the Owner's project inspector of any changes to subcontractor list for the duration of the project.

| <u>TASKS TO BE PERFORMED</u>                | <u>SUBCONTRACTOR NAME</u> | <u>LICENSE NO.</u> | <u>ADDRESS</u>           | <u>ITEM #'S OF WORK TO BE PERFORMED</u> |
|---------------------------------------------|---------------------------|--------------------|--------------------------|-----------------------------------------|
| Surveying/Layout                            |                           |                    |                          |                                         |
| Permitting                                  |                           |                    |                          |                                         |
| Clearing & Grubbing                         |                           |                    |                          |                                         |
| Erosion Control                             |                           |                    |                          |                                         |
| Traffic Control                             |                           |                    |                          |                                         |
| Excavation                                  |                           |                    |                          |                                         |
| Concrete                                    |                           |                    |                          |                                         |
| Storm Drainage                              |                           |                    |                          |                                         |
| Sanitary Sewer                              |                           |                    |                          |                                         |
| Shoring/Monitoring                          |                           |                    |                          |                                         |
| Retaining Walls                             |                           |                    |                          |                                         |
| Bridges                                     |                           |                    |                          |                                         |
| Railroads                                   |                           |                    |                          |                                         |
| Traffic (signals, loops)                    |                           |                    |                          |                                         |
| Street Lights                               |                           |                    |                          |                                         |
| Electrical                                  |                           |                    |                          |                                         |
| Water                                       |                           |                    |                          |                                         |
| Asphalt                                     |                           |                    |                          |                                         |
| Landscaping (Trees, grassing)               |                           |                    |                          |                                         |
| Irrigation                                  |                           |                    |                          |                                         |
| Striping                                    |                           |                    |                          |                                         |
| Sewer Testing                               | Meyer Enterprises         | S-46647            | 3996 Hawks Way NE        | 2-13                                    |
| Guardrails                                  |                           |                    | Huntsville AL 35811-2635 |                                         |
| Handrails                                   |                           |                    |                          |                                         |
| Painting                                    |                           |                    |                          |                                         |
| Special (fencing, benches, dewatering etc.) |                           |                    |                          |                                         |
| Mechanical                                  |                           |                    |                          |                                         |
| SCADA                                       |                           |                    |                          |                                         |

ATTACHMENT "D"

WPC SANITARY SEWER RELOCATION  
COUNTY LINE ROAD & I-565  
COH PROJ. NO. 85-12-SM01 & ALDOT PROJ. NO. IM-1565(307)

Contractor shall provide at least five (5) references including NAME OF PROJECT, Owner Name, address, phone number and contact name that demonstrates contractor's ability on similar projects.

1. City of Huntsville University & Paramount Intersection Improvements  
320 Fountain Circle  
Huntsville, Alabama 35804  
POC: Dennis Thompson, PHone: (256) 535-2489
  
2. City of Huntsville Highway 72 West Meridian Crossover  
320 Fountain Circle  
Huntsville, Alabama 35804  
POC: Dennis Thompson, PHone: (256) 535-2489
  
3. City of Huntsville Mastin Lake Road Improvements  
320 Fountain Circle  
Huntsville, Alabama 35804  
POC: Chris McNeese, Phone: (256) 535-2489
  
4. City of Huntsville Farrow Road Improvements  
320 Fountain Circle  
Huntsville, Alabama 35804  
POC: Cathy Martin, Phone: (256) 535-2489
  
5. City of Huntsville Shields Road Extension  
320 Fountain Circle  
Huntsville, Alabama 35804  
POC: Chris McNeese, Phone: (256) 535-2489

**ATTACHMENT "E"**

**MANDATORY Pre-Bid meeting to be held on Wednesday, January 15, 2014 at 10:00 a.m. in the 1st Floor Conference Room at 320 Fountain Circle, Huntsville, AL 35801. Bidders must attend this pre-bid meeting in order to be eligible to submit a bid.**

**NOTICE TO CONTRACTORS**

**WANTED: Sealed bids in duplicate for the construction of: WPC Sanitary Sewer Relocation-County Line Road & I-565, more particularly known as Project No. 65-12-SM01**

**Description of Project: The project consists of installation of approximately 7,100 LF of owner-furnished 16-inch Ductile Iron Piping Sanitary Sewer, 1,900 LF of owner-furnished 18-inch Ductile Iron Piping Forcemain and all required connections, manholes, valves and appurtenances. The project also includes one creek crossing and one 30-inch steel encasement roadway bore.**

The attention of all bidders is called to Code of Alabama §§ 34-8-1 and 34-8-2 (1975) and 34-8-1, 34-8-2, 34-8-4, 34-8-6, 34-8-7, 34-8-8 and 34-8-9 (amended 1996) setting forth the definition of general contractor and the licensing procedures and requirements for state licensing. A copy of the above Codes may be obtained from the OWNER (City of Huntsville). No one is entitled to bid and no contract may be awarded to anyone who does not possess a valid general contractor's license and the required classification for the municipal type work to be performed. The general contractor's license and classification must appear on the outside of the bid envelope along with the general contractor's name and address, project name and number and date and time of bid opening. Section 39-3-5 Code of Alabama has been amended as follows:

"In awarding the Contract, preference will be given to Alabama resident contractors and a nonresident bidder domiciled in a state having laws granting preference to local contractors shall be awarded the Contract only on the same basis as the nonresident bidder's state awards contracts to Alabama contractors bidding under similar circumstances."

This project WPC Sanitary Sewer Relocation-County Line Road & I-565, more particularly known as Project No. 65-12-SM01 requires the contractor to possess a State of Alabama Classification of Municipal & Utility (MU) or Municipal & Utility Specialty Construction MU-(S) - Sewer Projects.

After proposals are opened and read, they will be compared on the basis of the summation of the products or approximate quantities shown in Attachment "A", multiplied by the unit bid prices. In the event of a discrepancy between unit bid prices and extensions, the unit bid price shall govern. A proposal will not be considered unless signed by the bidder or his authorized agent and accompanied by cashier's check or properly signed bid bond, as required by law.

In determining the successful bidder, the Owner will consider in addition to the bid prices, such responsibility factors as characteristics and responsibility, skill, experience, record of Integrity in business, and of performance offered and past record of performance on Owner contracts on other similar projects. Any other factors not specifically mentioned or provided for herein, in addition to that of the bid price which would affect the final cost of the Owner, will be taken into consideration in making award of contract. The right is reserved to reject any bid where investigation of the business and technical organization of the bidder available for the contemplated work, including financial resources, equipment, and experience on similar projects does not satisfy the Owner that such bidder is qualified to perform the work. The City Council of the City of Huntsville reserves the right to reject any and all bids and to waive informalities.

Separate sealed bids for the construction of this project will be received at the City of Huntsville Public Services Building, 320 Fountain Circle, in the 1st Floor in the Conference Room, on the 28<sup>th</sup> day of January, 2014, until 10:00 am. Each bid shall be accompanied by an original signed, dated and sealed Bid Bond in the amount of not less than five percent (5%) of the total shown on the schedule of prices, but not exceeding \$10,000.00. Quantities are known as Attachment "A". No bidder may withdraw his bid within ninety (90) days after the actual date of opening.

These Addenda, Special Provisions, Plans, the Supplement to General Requirements for Construction of Public Improvements City of Huntsville Specifications, Standard Specifications for Construction of Public Improvements Contract Projects and all supplementary documents are essential parts of the contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complimentary and to describe and provide for a complete work. In case of discrepancy, calculated dimensions, unless obviously incorrect, shall govern over scaled dimensions. Plans shall govern over Supplemental Specifications, Supplemental Specifications shall govern over the Standard Specifications for Construction of Public Improvements Contract Projects. Special Provisions shall govern over Standard Specifications for Construction of Public Improvements Contract Projects, Supplemental Specifications. Standard Specifications for Construction of Public Improvements Contract Projects and Engineering Standards are available at no charge by downloading from the City Engineering website: [www.huntsvilleal.gov/engineering](http://www.huntsvilleal.gov/engineering) Plans and proposals can be downloaded from our website at no cost: [www.huntsvilleal.gov/engineering/bidlist.html](http://www.huntsvilleal.gov/engineering/bidlist.html) Contractors will be responsible for costs of duplicating their own plans and can choose photocopying facility of their choice.

Additionally, Contractors are responsible for checking website for any revisions/updates. Contractor is required to submit pricing, provided by the COH (Attachment "A") and made available for download from the Engineering website, on either a 3 1/2" floppy disk or CD-RW (preferably in a live/flash drive format) in the Excel format.

The bid disk or the CD-RW (preferably in a live/flash drive format) must be in working condition and included with original bid packet and reflect the correct revision, along with two signed hard copies. Failure to do so may be cause for rejection of bid. If a price discrepancy is found on bid disk or CD-RW, or the correct version of bid quantities is not submitted on the disk or CD-RW which corresponds to the printed hard copy, then printed hard copy prices submitted with original bid documents, with Contractor signature, will prevail.

#### E-VERIFY – NOTICE

The Beason-Hammon Alabama Taxpayer and Citizen Protection Act, Act No. 2011-535, Code of Alabama (1975) § 31-13-1 through 31-13-30 (also known as and hereinafter referred to as "the Alabama Immigration Act") as amended by Act No. 2012-491 on May 16, 2012 is applicable to all competitively bid contracts with the City of Huntsville. As a condition for the award of a contract and as a term and condition of the contract with the City of Huntsville, in accordance with § 31-13-9 (a) of the Alabama Immigration Act, as amended, any business entity or employer that employs one or more employees shall not knowingly employ, hire for employment, or continue to employ an unauthorized alien within the State of Alabama. During the performance of the contract, such business entity or employer shall participate in the E-Verify program and shall verify every employee that is required to be verified according to the applicable federal rules and regulations. The business entity or employer shall assure that these requirements are included in each subcontract in accordance with §31-13-9(c). Failure to comply with these requirements may result in breach of contract, termination of the contract or subcontract, and possibly suspension or revocation of business licenses and permits in accordance with §31-13-9 (e) (1) & (2). Code of Alabama (1975) § 31-13-9 (k) requires that the following clause be included in all City of Huntsville contracts that have been competitively bid and is hereby made a part of this contract:

"By signing this contract the contracting parties affirm, for the duration of the agreement, that they will not violate federal immigration law or knowingly employ, hire for employment, or continue to employ an unauthorized alien within the State of Alabama. Furthermore, a contracting party found to be in violation of this provision shall be deemed in breach of the agreement and shall be responsible for all damages resulting therefrom."

Contractor's E-Verify Memorandum of Understanding shall be a part of the contract bid documents and shall be submitted with the bid package.

#### **ALABAMA IMMIGRATION ACT (Beason-Hammon Alabama Taxpayer and Citizen Protection Act, Act No. 2011-535, Code of Alabama (1975)**

Compliance with the requirements of the (Beason-Hammon Alabama Taxpayer and Citizen Protection Act, Act No. 2011-535, Code of Alabama (1975) § 31-13-1 through 31-13-30, as amended by Alabama Act 2012-241, commonly referred to as the Alabama Immigration Law, is required for City of Huntsville, Alabama contracts that are competitively bid as a condition of the contract performance. The Contractor shall submit in the bid package, with the requested information included on the form, the "City of Huntsville, Alabama Report of Ownership Form" listed in the bid proposal as Attachment "H". The bidder selected for award of the contract may be required to complete additional forms relating to citizenship or alien status of the bidder and its employees, including e-verify information, prior to award of a contract.

**ATTACHMENT "F"**  
**SAMPLE FORM**  
**REQUEST FOR PAYMENT**  
**CITY OF HUNTSVILLE ENGINEERING DIVISION**

PROJECT NAME AND NUMBER:

ESTIMATE NUMBER: ONE (1) PERIOD FROM: 03/11/05 TO \_\_\_\_\_  
 CONTRACT DURATION 0 DAYS  
 START DATE: 03/11/05 END DATE: 3/11/05 TOTAL CONTRACT TIME (3) 0 DAYS

REFER TO COH SUPPLEMENT  
 TO GENERAL REQUIREMENTS:  
 CHANGE ORDERS - CHANGE  
 TO CONTRACT TIME

|      |          |            |          |                         |          |
|------|----------|------------|----------|-------------------------|----------|
| TIME | C.O. # 1 | DAYS ADDED | <u>0</u> | CONTRACT DAYS REMAINING | <u>0</u> |
| TIME | C.O. # 2 | DAYS ADDED | <u>0</u> |                         |          |

TOTAL CONTRACT AMOUNT (1) AS AWARDED \$ 200,000.00 CURRENT \$ 200,000.00  
 C.O. # 1 \$ \_\_\_\_\_  
 C.O. # 2 \$ \_\_\_\_\_

TOTAL AMOUNT EARNED TO DATE LESS STORED MATERIALS (2) \$ \_\_\_\_\_

MATERIAL STORED (INVOICE ATTACHED) \$ \_\_\_\_\_

RETAINAGE (5% OF 50% OF CONTRACT) Amount to be accordance with ALDOT and COB specifications and to be based on the contract amount before change orders. \$ \_\_\_\_\_

AMOUNT EARNED AFTER RETAINAGE \$ \_\_\_\_\_

LIQUIDATED DAMAGES PER DAY 300<sup>4</sup>

LIQUIDATED DAMAGES ASSESSED TO DATE: \$ \_\_\_\_\_

**FOR QUESTIONS RELATED TO PROJECT CALCULATIONS, LIQUIDATED DAMAGES, AND CHANGE ORDER REQUIREMENTS, PLEASE REFERENCE YOUR CONTRACT SUBJECT TO GENERAL REQUIREMENTS SECTION 4. CHANGE ORDERS. 11. PAYMENTS.**

Damages, if applicable, will automatically be calculated by subtracting the contract and date from the liquidated amount and date and multiplying the days by the daily damages amount. Damages will automatically be deducted from amounts otherwise due.

TOTAL AMOUNT PREVIOUSLY APPROVED TO DATE: \$ \_\_\_\_\_

AMOUNT DUE THIS ESTIMATE WITHOUT LIQUIDATED DAMAGES \$ \_\_\_\_\_

A: % OF TIME ELAPSED: TIME ELAPSED TO DATE \_\_\_\_\_ DAYS =  
 TOTAL CONTRACT TIME (3) 0 DAYS  
 B: PROJECT COMPLETION: TOTAL EARNED TO DATE (2) \_\_\_\_\_ = 0%  
 TOTAL CONTRACT AMOUNT 200,000.00  
 C: PROGRESS OF WORK B - A = \_\_\_\_\_

**CONTRACTORS CERTIFICATE**

We, the duly qualified, acting and authorized agent for the contractor on the above project, do hereby certify that we have performed all of the work set forth in strict accordance with the plans, specifications, laws and ordinances applicable thereto, and do further certify that all materials, labor, and equipment listed herein have been paid for in full as allowed on all prior estimates and if requested to do so, we will show evidence of completion and final payment in full for all work performed under the contract, including any amendments thereto and, upon payment of said sum, hereby release the Owner, its employees, agents, and representatives in accordance with said contract. We further certify that we fully guarantee all work performed hereunder for a period of twelve months from the date of payment of the final estimate (in accordance with the terms of our original contract and all amendments thereto), during which time all terms and conditions of the original contract document shall remain in full force and effect, including the insurance requirements, Hold Harmless Agreement, and Indemnifying Agreement as contained in said contract documents.

CERTIFIED FOR PAYMENT ON THIS THE \_\_\_\_\_ DAY OF \_\_\_\_\_  
 BY: \_\_\_\_\_ CONTRACTOR  
 TITLE: \_\_\_\_\_  
 SIGNED: \_\_\_\_\_ WITNESS: \_\_\_\_\_  
 SIGNATURE

We have checked the quantities and extensions to this estimate, and to the best of our knowledge, the estimate is true and correct

**APPROVED FOR PAYMENT**

BY: \_\_\_\_\_ CONSTRUCTION INSPECTOR  
 BY: \_\_\_\_\_ PROJECT ENGINEER  
 BY: \_\_\_\_\_ SHANE DAVIS, CITY ENGINEER  
 OR RON ADAMS, DEPUTY CITY ENGINEER  
 OR LYNN MAJORS, ADMINISTRATIVE OFFICER  
 IF FINAL ESTIMATE DATE WORK WAS COMPLETED: \_\_\_\_\_

## **ATTACHMENT "G"**

**All vendors/contractors are required to submit a Federal Tax Form W-9 to City of Huntsville at the time a contract is awarded, unless vendor/contractor is already registered and doing business with the City. No payments of invoices can be made until this W-9 Tax Form has been properly submitted. A copy of the W-9 Tax Form can be obtained at the following website: [www.irs.ustreas.gov/pub/irs-pdf/tw9.pdf](http://www.irs.ustreas.gov/pub/irs-pdf/tw9.pdf)**

Attachment H

**CITY OF HUNTSVILLE, ALABAMA REPORT OF OWNERSHIP FORM**

**A. General Information.** Please provide the following information:

- Legal name(s) (include "doing business as", if applicable): Reed Contracting Services, Inc.
- City of Huntsville current taxpayer identification number (if available): A Corporation  
(Please note that if this number has been assigned by the City and if you are renewing your business license, the number should be listed on the renewal form.)

**B. Type of Ownership.** Please complete the unshaded portions of the following chart by checking the appropriate box below and entering the appropriate Entity I.D. Number, if applicable (for an explanation of what an entity number is, please see paragraph C below):

| Type of Ownership<br>(circle) <i>corporation</i> <b>corp.</b>            | Entity I.D. Number<br>& Applicable State             |
|--------------------------------------------------------------------------|------------------------------------------------------|
| <input type="checkbox"/> Individual or Sole Proprietorship               |                                                      |
| <input type="checkbox"/> General Partnership                             |                                                      |
| <input type="checkbox"/> Limited Partnership (LP)                        | Number & State:                                      |
| <input type="checkbox"/> Limited Liability Partnership (LLP)             | Number & State:                                      |
| <input type="checkbox"/> Limited Liability Company (LLC) (Single Member) | Number & State:                                      |
| <input type="checkbox"/> LLC (Multi-Member)                              | Number & State:                                      |
| <input checked="" type="checkbox"/> Corporation                          | Number & State:<br><u>157-607-Alabama</u>            |
| <input type="checkbox"/> Other, please explain:                          | Number & State (if a filing entity under state law): |

**C. Entity I.D. Numbers.** If an Entity I.D. Number is required and if the business entity is registered in this state, the number is available through the website of Alabama's Secretary of State at [www.sos.state.al.us](http://www.sos.state.al.us), under "Government Records". If a foreign entity is not registered in this state please provide the Entity I.D. number (or other similar number by whatever named called) assigned by the state of formation along with the name of the state.

**D. Formation Documents.** Please note that, with regard to entities, the entity's formation documents, including articles or certificates of incorporation, organization, or other applicable formation documents, as recorded in the probate records of the applicable county and state of formation, are not required unless: (1) specifically requested by the City, or (2) an Entity I.D. Number is required and one has not been assigned or provided.

Please date and sign this form in the space provided below and either write legibly or type your name under your signature. If you are signing on behalf of an entity please insert your title as well.

Signature: [Signature] Title (if applicable): Vice President

Type or legibly write name: David L. Harris Date: February 4, 2014

Company ID Number: 109504

**THE E-VERIFY PROGRAM FOR EMPLOYMENT VERIFICATION**

**MEMORANDUM OF UNDERSTANDING**

**ARTICLE I**

**PURPOSE AND AUTHORITY**

This Memorandum of Understanding (MOU) sets forth the points of agreement between the Social Security Administration (SSA), the Department of Homeland Security (DHS) and **Reed Contracting Services Inc.** (Employer) regarding the Employer's participation in the Employment Eligibility Verification Program (E-Verify). E-Verify is a program in which the employment eligibility of all newly hired employees will be confirmed after the Employment Eligibility Verification Form (Form I-9) has been completed.

Authority for the E-Verify program is found in Title IV, Subtitle A, of the Illegal Immigration Reform and Immigrant Responsibility Act of 1996 (IIRIRA), Pub. L. 104-208, 110 Stat. 3009, as amended (8 U.S.C. § 1324a note).

**ARTICLE II**

**FUNCTIONS TO BE PERFORMED**

**A. RESPONSIBILITIES OF THE SSA**

1. Upon completion of the Form I-9 by the employee and the Employer, and provided the Employer complies with the requirements of this MOU, SSA agrees to provide the Employer with available information that allows the Employer to confirm the accuracy of Social Security Numbers provided by all newly hired employees and the employment authorization of U.S. citizens.
2. The SSA agrees to provide to the Employer appropriate assistance with operational problems that may arise during the Employer's participation in the E-Verify program. The SSA agrees to provide the Employer with names, titles, addresses, and telephone numbers of SSA representatives to be contacted during the E-Verify process.
3. The SSA agrees to safeguard the information provided by the Employer through the E-Verify program procedures, and to limit access to such information, as is appropriate by law, to individuals responsible for the verification of Social Security Numbers and for evaluation of the E-Verify program or such other persons or entities who may be authorized by the SSA as governed by the Privacy Act (5 U.S.C. § 552a), the Social Security Act (42 U.S.C. 1306(a)), and SSA regulations (20 CFR Part 401).
4. SSA agrees to establish a means of automated verification that is designed (in conjunction with DHS's automated system if necessary) to provide confirmation or tentative nonconfirmation of U.S. citizens' employment eligibility and accuracy of SSA records for both citizens and aliens within 3 Federal Government work days of the initial inquiry.

Company ID Number: 109504

5. SSA agrees to establish a means of secondary verification (including updating SSA records as may be necessary) for employees who contest SSA tentative nonconfirmations that is designed to provide final confirmation or nonconfirmation of U.S. citizens' employment eligibility and accuracy of SSA records for both citizens and aliens within 10 Federal Government work days of the date of referral to SSA, unless SSA determines that more than 10 days may be necessary. In such cases, SSA will provide additional verification instructions.

**B. RESPONSIBILITIES OF THE DEPARTMENT OF HOMELAND SECURITY**

1. Upon completion of the Form I-9 by the employee and the Employer and after SSA verifies the accuracy of SSA records for aliens through E-Verify, DHS agrees to provide the Employer access to selected data from DHS's database to enable the Employer to conduct:

- Automated verification checks on newly hired alien employees by electronic means, and
- Photo verification checks (when available) on newly hired alien employees.

2. DHS agrees to provide to the Employer appropriate assistance with operational problems that may arise during the Employer's participation in the E-Verify program. DHS agrees to provide the Employer names, titles, addresses, and telephone numbers of DHS representatives to be contacted during the E-Verify process.

3. DHS agrees to provide to the Employer a manual (the E-Verify Manual) containing instructions on E-Verify policies, procedures and requirements for both SSA and DHS, including restrictions on the use of E-Verify.. DHS agrees to provide training materials on E-Verify.

4. DHS agrees to provide to the Employer a notice, which indicates the Employer's participation in the E-Verify program. DHS also agrees to provide to the Employer anti-discrimination notices issued by the Office of Special Counsel for Immigration-Related Unfair Employment Practices (OSC), Civil Rights Division, and U.S. Department of Justice.

5. DHS agrees to issue the Employer a user identification number and password that permits the Employer to verify information provided by alien employees with DHS's database.

6. DHS agrees to safeguard the information provided to DHS by the Employer, and to limit access to such information to individuals responsible for the verification of alien employment eligibility and for evaluation of the E-Verify program, or to such other persons or entities as may be authorized by applicable law. Information will be used only to verify the accuracy of Social Security Numbers and employment eligibility, to enforce the Immigration and Nationality Act and federal criminal laws, and to ensure accurate wage reports to the SSA.

7. DHS agrees to establish a means of automated verification that is designed (in conjunction with SSA verification procedures) to provide confirmation or tentative nonconfirmation of employees' employment eligibility within 3 Federal Government work days of the initial inquiry.

Company ID Number: 109504

8. DHS agrees to establish a means of secondary verification (including updating DHS records as may be necessary) for employees who contest DHS tentative nonconfirmations and photo non-match tentative nonconfirmations that is designed to provide final confirmation or nonconfirmation of the employees' employment eligibility within 10 Federal Government work days of the date of referral to DHS, unless DHS determines that more than 10 days may be necessary. In such cases, DHS will provide additional verification instructions.

### **C. RESPONSIBILITIES OF THE EMPLOYER**

1. The Employer agrees to display the notices supplied by DHS in a prominent place that is clearly visible to prospective employees.
2. The Employer agrees to provide to the SSA and DHS the names, titles, addresses, and telephone numbers of the Employer representatives to be contacted regarding E-Verify.
3. The Employer agrees to become familiar with and comply with the E-Verify Manual.
4. The Employer agrees that any Employer Representative who will perform employment verification queries will complete the E-Verify Tutorial before that individual initiates any queries.
  - A. The employer agrees that all employer representatives will take the refresher tutorials initiated by the E-Verify program as a condition of continued use of E-Verify.
  - B. Failure to complete a refresher tutorial will prevent the employer from continued use of the program.
5. The Employer agrees to comply with established Form I-9 procedures, with two exceptions:
  - If an employee presents a "List B" identity document, the Employer agrees to only accept "List B" documents that contain a photo. (List B documents identified in 8 C.F.R. § 274a.2 (b) (1) (B)) can be presented during the Form I-9 process to establish identity).
  - If an employee presents a DHS Form I-551 (Permanent Resident Card) or Form I-766 (Employment Authorization Document) to complete the Form I-9, the Employer agrees to make a photocopy of the document and to retain the photocopy with the employee's Form I-9. The employer will use the photocopy to verify the photo and to assist the Department with its review of photo non-matches that are contested by employees. Note that employees retain the right to present any List A, or List B and List C, documentation to complete the Form I-9. DHS may in the future designate other documents that activate the photo screening tool.
6. The Employer understands that participation in E-Verify does not exempt the Employer from the responsibility to complete, retain, and make available for inspection Forms I-9 that relate to its employees, or from other requirements of applicable regulations or laws, except for the following modified requirements applicable by reason of the Employer's participation in E-Verify: (1) identity documents must have photos, as described in paragraph 5 above; (2) a

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rebuttable presumption is established that the Employer has not violated section 274A(a)(1)(A) of the Immigration and Nationality Act (INA) with respect to the hiring of any individual if it obtains confirmation of the identity and employment eligibility of the individual in compliance with the terms and conditions of E-Verify ; (3) the Employer must notify DHS if it continues to employ any employee after receiving a final nonconfirmation, and is subject to a civil money penalty between \$500 and \$1,000 for each failure to notify DHS of continued employment following a final nonconfirmation; (4) the Employer is subject to a rebuttable presumption that it has knowingly employed an unauthorized alien in violation of section 274A(a)(1)(A) if the Employer continues to employ any employee after receiving a final nonconfirmation; and (5) no person or entity participating in E-Verify is civilly or criminally liable under any law for any action taken in good faith on information provided through the confirmation system. DHS reserves the right to conduct Form I-9 compliance inspections during the course of E-Verify, as well as to conduct any other enforcement activity authorized by law.

7. The Employer agrees to initiate E-Verify verification procedures within 3 Employer business days after each employee has been hired (but after both sections 1 and 2 of the Form I-9 have been completed), and to complete as many (but only as many) steps of the E-Verify process as are necessary according to the E-Verify Manual. The Employer is prohibited from initiating verification procedures before the employee has been hired and the Form I-9 completed. If the automated system to be queried is temporarily unavailable, the 3-day time period is extended until it is again operational in order to accommodate the Employer's attempting, in good faith, to make inquiries during the period of unavailability. In all cases, the Employer must use the SSA verification procedures first, and use DHS verification procedures and photo screening tool only after the the SSA verification response has been given.
8. The Employer agrees not to use E-Verify procedures for pre-employment screening of job applicants, support for any unlawful employment practice, or any other use not authorized by this MOU. The Employer must use E-Verify for all new employees and will not verify only certain employees selectively. The Employer agrees not to use E-Verify procedures for re-verification, or for employees hired before the date this MOU is in effect. The Employer understands that if the Employer uses E-Verify procedures for any purpose other than as authorized by this MOU, the Employer may be subject to appropriate legal action and the immediate termination of its access to SSA and DHS information pursuant to this MOU.
9. The Employer agrees to follow appropriate procedures (see Article III.B. below) regarding tentative nonconfirmations, including notifying employees of the finding, providing written referral instructions to employees, allowing employees to contest the finding, and not taking adverse action against employees if they choose to contest the finding. Further, when employees contest a tentative nonconfirmation based upon a photo non-match, the Employer is required to take affirmative steps (see Article III.B. below) to contact DHS with information necessary to resolve the challenge.
10. The Employer agrees not to take any adverse action against an employee based upon the employee's employment eligibility status while SSA or DHS is processing the verification request unless the Employer obtains knowledge (as defined in 8 C.F.R. § 274a.1 (l)) that the employee is not work authorized. The Employer understands that an initial inability of the SSA or DHS automated verification to verify work authorization, a tentative nonconfirmation, or the finding of

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a photo non-match, does not mean, and should not be interpreted as, an indication that the employee is not work authorized. In any of the cases listed above, the employee must be provided the opportunity to contest the finding, and if he or she does so, may not be terminated or suffer any adverse employment consequences until and unless secondary verification by SSA or DHS has been completed and a final nonconfirmation has been issued. If the employee does not choose to contest a tentative nonconfirmation or a photo non-match, then the Employer can find the employee is not work authorized and take the appropriate action.

11. The Employer agrees to comply with section 274B of the INA by not discriminating unlawfully against any individual in hiring, firing, or recruitment or referral practices because of his or her national origin or, in the case of a protected individual as defined in section 274B(a)(3) of the INA, because of his or her citizenship status. The Employer understands that such illegal practices can include selective verification or use of E-Verify, discharging or refusing to hire eligible employees because they appear or sound "foreign", and premature termination of employees based upon tentative nonconfirmations, and that any violation of the unfair immigration-related employment practices provisions of the INA could subject the Employer to civil penalties pursuant to section 274B of the INA and the termination of its participation in E-Verify. If the Employer has any questions relating to the anti-discrimination provision, it should contact OSC at 1-800-255-7688 or 1-800-237-2515 (TDD).

12. The Employer agrees to record the case verification number on the employee's Form I-9 or to print the screen containing the case verification number and attach it to the employee's Form I-9.

13. The Employer agrees that it will use the information it receives from the SSA or DHS pursuant to E-Verify and this MOU only to confirm the employment eligibility of newly-hired employees after completion of the Form I-9. The Employer agrees that it will safeguard this information, and means of access to it (such as PINS and passwords) to ensure that it is not used for any other purpose and as necessary to protect its confidentiality, including ensuring that it is not disseminated to any person other than employees of the Employer who are authorized to perform the Employer's responsibilities under this MOU.

14. The Employer acknowledges that the information which it receives from SSA is governed by the Privacy Act (5 U.S.C. § 552a (i) (1) and (3)) and the Social Security Act (42 U.S.C. 1306(a)), and that any person who obtains this information under false pretenses or uses it for any purpose other than as provided for in this MOU may be subject to criminal penalties.

15. The Employer agrees to allow DHS and SSA, or their authorized agents or designees, to make periodic visits to the Employer for the purpose of reviewing E-Verify -related records, i.e., Forms I-9, SSA Transaction Records, and DHS verification records, which were created during the Employer's participation in the E-Verify Program. In addition, for the purpose of evaluating E-Verify, the Employer agrees to allow DHS and SSA or their authorized agents or designees, to interview it regarding its experience with E-Verify, to interview employees hired during E-Verify use concerning their experience with the pilot, and to make employment and E-Verify related records available to DHS and the SSA, or their designated agents or designees. Failure to comply with the terms of this paragraph may lead DHS to terminate the Employer's access to E-Verify.

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**ARTICLE III**

**REFERRAL OF INDIVIDUALS TO THE SSA AND THE DEPARTMENT OF  
HOMELAND SECURITY**

**A. REFERRAL TO THE SSA**

1. If the Employer receives a tentative nonconfirmation issued by SSA, the Employer must print the tentative nonconfirmation notice as directed by the automated system and provide it to the employee so that the employee may determine whether he or she will contest the tentative nonconfirmation.
2. The Employer will refer employees to SSA field offices only as directed by the automated system based on a tentative nonconfirmation, and only after the Employer records the case verification number, reviews the input to detect any transaction errors, and determines that the employee contests the tentative nonconfirmation. The Employer will transmit the Social Security Number to SSA for verification again if this review indicates a need to do so. The Employer will determine whether the employee contests the tentative nonconfirmation as soon as possible after the Employer receives it.
3. If the employee contests an SSA tentative nonconfirmation, the Employer will provide the employee with a referral letter and instruct the employee to visit an SSA office to resolve the discrepancy within 8 Federal Government work days. The Employer will make a second inquiry to the SSA database using E-Verify procedures on the date that is 10 Federal Government work days after the date of the referral in order to obtain confirmation, or final nonconfirmation, unless otherwise instructed by SSA or unless SSA determines that more than 10 days is necessary to resolve the tentative nonconfirmation..
4. The Employer agrees not to ask the employee to obtain a printout from the Social Security Number database (the Numident) or other written verification of the Social Security Number from the SSA.

**B. REFERRAL TO THE DEPARTMENT OF HOMELAND SECURITY**

1. If the Employer receives a tentative nonconfirmation issued by DHS, the Employer must print the tentative nonconfirmation notice as directed by the automated system and provide it to the employee so that the employee may determine whether he or she will contest the tentative nonconfirmation.
2. If the Employer finds a photo non-match for an alien who provides a document for which the automated system has transmitted a photo, the employer must print the photo non-match tentative nonconfirmation notice as directed by the automated system and provide it to the employee so that the employee may determine whether he or she will contest the finding.
3. The Employer agrees to refer individuals to DHS only when the employee chooses to contest a tentative nonconfirmation received from DHS automated verification process or when

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the Employer issues a tentative nonconfirmation based upon a photo non-match. The Employer will determine whether the employee contests the tentative nonconfirmation as soon as possible after the Employer receives it.

4. If the employee contests a tentative nonconfirmation issued by DHS, the Employer will provide the employee with a referral letter and instruct the employee to contact the Department through its toll-free hotline within 8 Federal Government work days.

5. If the employee contests a tentative nonconfirmation based upon a photo non-match, the Employer will provide the employee with a referral letter to DHS. DHS will electronically transmit the result of the referral to the Employer within 10 Federal Government work days of the referral unless it determines that more than 10 days is necessary.

6. The Employer agrees that if an employee contests a tentative nonconfirmation based upon a photo non-match, the Employer will send a copy of the employee's Form I-551 or Form I-766 to DHS for review by:

- Scanning and uploading the document, or
- Sending a photocopy of the document by an express mail account (furnished and paid for by DHS).

7. The Employer understands that if it cannot determine whether there is a photo match/non-match, the Employer is required to forward the employee's documentation to DHS by scanning and uploading, or by sending the document as described in the preceding paragraph, and resolving the case as specified by the Immigration Services Verifier at DHS who will determine the photo match or non-match.

#### **ARTICLE IV**

##### **SERVICE PROVISIONS**

The SSA and DHS will not charge the Employer for verification services performed under this MOU. The Employer is responsible for providing equipment needed to make inquiries. To access the E-Verify System, an Employer will need a personal computer with Internet access.

#### **ARTICLE V**

##### **PARTIES**

This MOU is effective upon the signature of all parties, and shall continue in effect for as long as the SSA and DHS conduct the E-Verify program unless modified in writing by the mutual consent of all parties, or terminated by any party upon 30 days prior written notice to the others. Any and all system enhancements to the E-Verify program by DHS or SSA, including but not limited to the E-Verify checking against additional data sources and instituting new verification procedures, will be covered under this MOU and will not cause the need for a supplemental MOU that outlines these changes. DHS agrees to train employers on all changes made to E-Verify through the use of mandatory refresher tutorials and updates to the E-Verify manual. Even

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without changes to E-Verify, the Department reserves the right to require employers to take mandatory refresher tutorials.

Termination by any party shall terminate the MOU as to all parties. The SSA or DHS may terminate this MOU without prior notice if deemed necessary because of the requirements of law or policy, or upon a determination by SSA or DHS that there has been a breach of system integrity or security by the Employer, or a failure on the part of the Employer to comply with established procedures or legal requirements. Some or all SSA and DHS responsibilities under this MOU may be performed by contractor(s), and SSA and DHS may adjust verification responsibilities between each other as they may determine.

Nothing in this MOU is intended, or should be construed, to create any right or benefit, substantive or procedural, enforceable at law by any third party against the United States, its agencies, officers, or employees, or against the Employer, its agents, officers, or employees.

Each party shall be solely responsible for defending any claim or action against it arising out of or related to E-Verify or this MOU, whether civil or criminal, and for any liability wherefrom, including (but not limited to) any dispute between the Employer and any other person or entity regarding the applicability of Section 403(d) of IIRIRA to any action taken or allegedly taken by the Employer.

The employer understands that the fact of its participation in E-Verify is not confidential information and may be disclosed as authorized or required by law and DHS or SSA policy, including but not limited to, Congressional oversight, E-Verify publicity and media inquiries, and responses to inquiries under the Freedom of Information Act (FOIA).

The foregoing constitutes the full agreement on this subject between the SSA, DHS, and the Employer.

The individuals whose signatures appear below represent that they are authorized to enter into this MOU on behalf of the Employer and DHS respectively.

**To be accepted as a participant in E-Verify, you should only sign the Employer's Section of the signature page. If you have any questions, contact E-Verify Operations at 888-464-4218.**

**Employer Reed Contracting Services Inc.**

**Paul I Moore**

\_\_\_\_\_  
Name (Please type or print)

\_\_\_\_\_  
Title

***Electronically Signed***

**03/26/2008**

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**Department of Homeland Security - Verification Division**



**SUPPLEMENT TO GENERAL REQUIREMENTS**

**FOR**

**CONSTRUCTION OF PUBLIC IMPROVEMENTS**

**WPC SANITARY SEWER RELOCATION  
COUNTY LINE ROAD & I-565**

**COH PROJ. NO. 65-12-SM01 & ALDOT PROJ. NO. IM-1565(307)**

**CITY OF HUNTSVILLE, ALABAMA**

## SUPPLEMENT TO GENERAL REQUIREMENTS

### 1. GENERAL

The attention of all bidders is called to Code of Alabama §§ 34-8-1 and 34-8-2 (1975) AND 34-8-1, 34-8-2, 34-8-4, 34-8-6, 34-8-7, 34-8-8 AND 34-8-9 (AMENDED 1996) setting forth the definition of general contractor and the licensing procedures and requirements for state licensing. No one is entitled to bid and no contract may be awarded to anyone who does not possess a valid general contractor's license and the required classification for the municipal type work to be performed. The general contractor's State of Alabama license and classification must appear on the outside of the bid envelope along with the general contractor's name and address, project name and number and date and time of bid opening. Failure to provide this will be cause to reject the bid.

In determining the successful bidder, the Owner will consider in addition to the bid prices, such responsibility factors as characteristics and responsibility, skill, experience, record of integrity in business, and of performance offered and past record of performance on Owner contracts on other similar projects. Any other factors not specifically mentioned or provided for herein, in addition to that of the bid price which would affect the final cost to the Owner, will be taken into consideration in making award of contract. The right is reserved to reject any bid where investigation of the business and technical organization of the bidder available for the contemplated work, including financial resources, equipment, and experience on similar projects does not satisfy the Owner that such bidder is qualified to perform the work. The City Council of the City of Huntsville reserves the right to reject any and all bids and to waive informalities.

Separate sealed bids for the construction of this project shall be accompanied by Bid Bond in the amount of five percent (5%) of the amount of the bid not to exceed \$10,000.00. Quantities are known as Attachment "A". No bidder may withdraw his bid within ninety (90) days after the actual date of opening. These specifications, the supplemental specifications, the plans, special provisions and all supplementary documents are essential parts of the contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In case of discrepancy, calculated dimensions, unless obviously incorrect, shall govern over scaled dimensions. Supplemental Specifications shall govern over the Standard Specifications for Construction of Public Improvements Contract Projects. Plans shall govern over Standard Specifications for Construction of Public Improvements Contract Projects. Special Provisions shall govern over Standard Specifications for Construction of Public Improvements Contract Projects, Supplemental Specifications, and Plans. All bid openings and any scheduled pre-bid conferences are open to the public and will be held in the Public Services Conference Room on the 1st Floor at 320 Fountain Circle, Huntsville, Alabama, unless otherwise noted.

All references to OWNER shall mean City of Huntsville, Alabama. All references to City Engineer shall mean OWNER.

### 2. PROPOSAL PREPARATION

(A) Proposal Form. The bidder's proposal must be submitted on the complete original proposal form furnished him by the City. Unless otherwise provided in the proposal, joint venturers may submit a proposal for a joint venture of qualified bidders on a proposal form issued to one of them, provided each venturer has taken out a proposal and provided the proposal is signed by each co-venturer.

(B) Details. On the proposal form, the bidder shall enter in numbers a unit price and the extended amount bid (unit price x quantity) in the appropriate column for each bid item, exclusive of those items for which a fixed contract unit price and extension amount are shown. On lump sum items an entry shall be shown in the amount bid column. If a bidder wishes to bid an item free, then he shall enter 0 (zero) in both the unit price column and amount bid column. After all extensions are made, the bidder shall total the extended amounts of the bid items and show his total bid amount in the appropriate place on the proposal form. All figures shall be legibly shown in ink or typed. Any interlineation, erasure or other alteration of a figure shall be initialed by the signer of the proposal. The City will check the extension of each item given in the proposal and correct all errors and discrepancies. In case of a discrepancy between a unit bid price and the extension amount, the unit price shall govern. The sum of the extension amounts will be the contract bid price. The undersigned bidder further understands that any deletions or additions designated on the outside of the bid envelope, must indicate the particular bid item relative to the deletion or addition, even if the deletion or addition references to deduct or add to the Total Base Bid.

(C) Signing. The bidder's proposal must be signed with ink by the individual, by one or more members of the partnership, by one or more members or officers of each firm representing a joint venture, or by one or more officers of a corporation or by an agent of the Contractor legally qualified and acceptable to the City. If the proposal is made by an individual, his name and post office address must be shown; by a partnership, the name and post office address of each partnership member must be shown; as a joint venture, the name and post office address of each member or officer of the firms represented by the joint venture must be shown; by a corporation, the name of the corporation and the business address of its corporate officials must be shown. The proposal bid bond, if bid bond is tendered, shall be properly signed by the bidder and the surety.

(D) Irregular Proposals. Proposals will be considered irregular and will be rejected if they contain any omissions, alteration of form, additions not called for, incomplete bids (includes failure to enter a unit bid price on a bid item or, in the case of an alternate, the alternate being bid by the Contractor), interlineations, erasures or alterations not initialed by the person signing the proposal, or other irregularities of any kind. Bids that are not signed will be considered non-responsive and will be

rejected. No proposal will be opened that does not contain the contractor's Alabama State license number. Proposals may be rejected at any time prior to the execution of the contract. Any bidder using the same or different names for submitting more than one proposal upon any project will be disqualified from further consideration on that project.

(E) Delivery of Proposals. Each proposal for each contract shall be placed, together with the proposal guaranty, in a sealed envelope on the outside of which is written in large letters "Proposals for Work" and so marked as to indicate the project name, project number, bidder name, and State license number. Proposals will be received by the OWNER or his representative unless otherwise provided until the hour and date set in the notice to Contractors for the opening thereof. No proposal will be considered which has not been received prior to the hour and date set for the opening of bids. Proposals received after that time will be returned. No proposal will be opened that does not contain the contractor's Alabama State license number.

### 3. QUANTITIES

The undersigned bidder understands that when unit prices are called for, the quantities shown herein are approximate only and are subject to increase or decrease, and offers to do the work whether the quantities are increased, or decreased, at the unit prices stated in the proposal. Any substantial changes requiring an increase must be approved by change order prior to work and authorized by City Council Action. The undersigned bidder also understands that when lump sum bids are called for, he will be required to furnish all equipment, labor, material and other items or cost to construct a complete facility. See Attachment "A" - Bid Quantities or revised Attachment if quantities have changed after pre-bid meeting.

### 4. CHANGE ORDERS

#### (A) Changes in the Work

Without invalidating the agreement, the owner may, at any time or from time to time, order additions, deletions or revisions in the work; these will be authorized by change orders. Upon receipt of a change order, the contractor will proceed with the work involved. All such work shall be executed under the applicable conditions of the contract documents. A change order signed by the contractor indicates his agreement.

The OWNER may authorize minor changes or alterations in the work not involving extra cost and not inconsistent with the overall intent of the contract documents. These may be accomplished by a field order.

Additional work performed by the contractor without authorization of a change order will not entitle him to an increase in the contract price or an extension of the contract time, except in the case of an emergency.

The owner will execute appropriate change orders prepared by the engineer covering changes in the work to be performed and work performed in an emergency and any other claim of the contractor for a change in the contract time or the contract price which shall be approved by the OWNER.

It is the contractor's responsibility to notify his surety of any changes affecting the general scope of the work or change in the contract price and the amount of the applicable bonds shall be adjusted accordingly. The contractor will furnish proof of such adjustment to the owner.

#### (B) Change of Contract Price.

The contract price may only be changed by a change order. Any claim for additional compensation shall be based on written notice delivered to the Owner and Engineer within ten (10) days of the occurrence of the event giving rise to the claim. Notice of the extent of the claim with supporting data shall be delivered within forty-five (45) days of such occurrence unless OWNER allows an additional period of time to ascertain more accurate data. The contract price constitutes the total compensation payable to the contractor for performing the work. All duties, responsibilities and obligations assigned to or undertaken by the contractor shall be at his expense without changing the contract price. The owner may at any time without notice to the sureties, by written order designated or indicated to be a change order, make any change in the work within the general scope of the contract, including but not limited to changes: (1) in the specifications (including drawings and designs); (2) in the method or manner of performance of the work; (3) in the owner-furnished facilities, equipment, materials, services, or site; or (4) directing acceleration in the performance of the work. Any other written order or an oral order from the owner which causes any such change, shall be treated as a change order under this clause, provided that the contractor gives the owner written notice stating the date, circumstances, and source of the order and that the contractor regards the order as a change order.

#### (C) Change in the Contract Time.

The contract time may only be changed by a change order. Any claim for an extension in the contract time shall be based on written notice delivered to the owner and engineer within ten (10) days of the occurrence of the event giving rise to the claim. Notice of the extent of the claim with supporting data shall be delivered within forty-five (45) days of such occurrence unless OWNER allows an additional period of time to ascertain more accurate data. All claims for adjustment in the contract time shall be determined by OWNER if owner and contractor cannot otherwise agree. Any change in the contract time resulting from any such claim shall be incorporated in a change order. The contract time will be extended in an amount equal to time

lost due to delays beyond the control of contractor if he makes a claim as provided above. Such delays shall include, but not be restricted to, acts or neglect by any separate contractor employed by owner, fires, floods, labor disputes, epidemics, abnormal weather conditions, or acts of God.

All time limits stated in the contract documents are of the essence of the agreement. The provisions shall not exclude recovery for damages (including compensation for additional professional services) for delay by either party. No claim for delay shall be allowed because of failure to furnish drawings until two weeks after demand for such drawings and not then unless such claim be reasonable.

**(D) Time extension for abnormal weather conditions**

In order for the owner to award a time extension for abnormal weather, the following conditions must be satisfied:

1. The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.
2. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without fault or negligence of the contractor.

The following table of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) and similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's normal progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities. The contractor's bid shall include the impact of the anticipated lost days in his quotation for the time he is to be on site.

| JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 11  | 8   | 6   | 4   | 4   | 5   | 6   | 4   | 4   | 3   | 4   | 8   |

Actual adverse weather delay days must prevent work on critical activities for 50% or more of the contractor's scheduled work day before it is considered a weather delay day.

**5. MAINTAIN OFFICE**

The successful contractor shall establish an office in Huntsville, Alabama, with telephone service, and shall maintain close liaison with the OWNER.

**6. SUBCONTRACTORS**

The prime contractor shall be responsible for all work covered under the executed contract; therefore, this responsibility cannot be shifted by subcontracting the work to others. All subcontractors shall be approved by the OWNER and shall be properly licensed as required by Alabama State Law. (Code of Alabama §§ 34-8-1 and 34-8-2 (1975) AND 34-8-1, 34-8-2, 34-8-4, 34-8-6, 34-8-7, 34-8-8 AND 34-8-9 (AMENDED 1996)) A list of all subcontractors proposed for use on the project shall be provided to the OWNER at the time that bids are received. This document will be known as ATTACHMENT "C". Lien waivers will be required from all subcontractors at the time of submittal of the final payment request. Contractor shall keep the "Subcontractor's Listing" updated throughout the project duration and submit a copy of the listing with the request for final payment. Noncompliance with this request may cause delay in payment to the Contractor.

All subcontractors must be approved in writing by Owner. If the subs listed on Attachment "C" are approved by the Owner, you will be notified in your notice to proceed. Any additional subcontractors needed during the contract period shall be approved by written letter from the Owner. See Section 39 for Correction to City of Huntsville Standards Specifications for Construction.

**7. BID BOND**

Accompanying this proposal is a certified check or original signed, dated and sealed bid bond in the amount of not less than five percent (5%) of the total amount shown on the schedule of prices, not exceeding \$10,000.00 dollars, payable to the City of Huntsville, Alabama, which is to be forfeited, as liquidated damages, if, in the event that his proposal is accepted, the undersigned shall fail to execute the contract and furnish a satisfactory contract bond under the conditions and within the time specified in this proposal; otherwise, said certified check or bid bond is to be returned to the undersigned.

**8. N/A**

**9. LIABILITY INSURANCE (SEE ALSO ATTACHED INSURANCE FOR CONTRACTORS, WHICH IS SHOWN AS SECTION 24.)**

The Contractor shall provide and maintain comprehensive general public liability insurance protecting the Contractor and the City against claims arising out of or resulting from the Contractor's operation under his contract for personal injury or property damage with minimum combined single limits of \$1,000,000, whether such operations are performed by himself, or by anyone directly or indirectly employed by them. In addition, a copy of the policy may be requested upon award. Certificates of insurance acceptable to the City shall be filed with the City prior to commencement of work and said certificate shall provide that policies will not be altered or canceled until at least 30 days prior written notice has been given to the City.

The Contractor shall indemnify and hold the OWNER, its officers and employees harmless from any suits, claims, demands, damages, liabilities, costs and expenses including reasonable attorney's fees, arising out of or resulting from the performance of the work. Certificates of insurance are required naming the City as the Certificate Holder. The Certificates should reflect the insurance coverage required herein. The Certificates are to be signed by a person authorized by the insurer to bind coverage on its behalf and must be an original signature. Certificates signed using digital signatures will not be accepted unless accompanied by a written statement from the insurance/surety company indicating that their electronic signature is intended as their signature. The Certificates must indicate coverage will not be canceled or non-renewed except after thirty (30) days prior written notice to the City at the following address: City of Huntsville, P.O. Box 308, Huntsville, Alabama 35804, Attention: Penny Kelly.

**10. LICENSES AND CLASSIFICATIONS**

In order to receive the award of this contract, the Contractor shall be required to possess a valid general contractor's license in accordance with Code of Alabama §§34-8-2 (1975) and (1998 amended) Code of Alabama as stated in Section 1 above. This general contractor's license shall be a State of Alabama general contractor's license and shall be maintained throughout the term of this contract. A valid City of Huntsville license shall also be maintained throughout the term of this contract.

The required classification for this project is stated in the Notice to Contractors also known as Attachment "E".

**11. PERMITS**

Additionally, the contractor shall be required to obtain and pay for all other federal, state or local permits, licenses, and fees which may be necessary or required in order to perform the work detailed herein. A City of Huntsville Contractor's License must be obtained from the City of Huntsville Inspection Department at the time signatures are obtained on contracts. A copy of City of Huntsville license shall be provided to the OWNER at the time the contract is executed. If project requires an ADEM permit, the Contractor is responsible for transferring the ADEM permit from the City of Huntsville to the Contractor upon award of bids.

**12. PAYMENT**

The OWNER agrees to pay the Contractor as follows: Once each month per project. The OWNER shall make partial payment to the Contractor on the basis of duly certified and approved estimates of the work performed during the preceding month by the Contractor, less five percent (5%) of the amount of such estimate, which is to be retained by the City until all of the work has been performed. Owner reserves the right to withhold payments for, but not limited to: a) defective work not remedied or defective materials not removed from site; b) claims filed, or reasonable evidence indicating imminent filing of claims against the Contractor; c) failure of the Contractor to make payments properly to subcontractors for labor, materials and equipment; d) a reasonable doubt that the Contract can be completed for the balance then unpaid; e) damage to another Contractor; f) performance of work in violation of the terms of the Contract; g) expiration of Contract time. Liquidated damages will be deducted from all invoices when the invoice estimate period end date is later than the contract completion date. All pay requests will be submitted by hard copy and on disk. The hard copy will be printed from the disk. A sample copy of the invoice is attached as Attachment "F". The OWNER will provide the disk to the contractor. Two originals and two copies of the invoices are required before payment will be made. The disk should be submitted each month, along with the originals and copies, to the Administrative Officer in the Engineering Department. No further retainage will be held after fifty percent (50%) of the contract is complete. All payments to Contractor will be made as soon as practical after the approval and finance processes have been completed. SEE SECTION 32 FOR INFORMATION ON FINAL PAYMENT.

**13. N/A**

**14. EXAMINATION OF PLANS, SPECIFICATIONS, SPECIAL PROVISIONS, and SITE WORK**

Before submitting a proposal, bidders shall examine carefully the site of the proposed work, the general and local conditions, the proposal form, standard specifications, supplemental specifications, special provisions, all addenda, and the bid bond form, and it is mutually agreed that the submission of a proposal shall be prima facie evidence that the bidder has made such examination and has judged for and satisfied himself as to the conditions to be encountered in performing the work, and to the requirements of plans, standard specifications, supplemental specifications, special provisions, contract, and bonds. No adjustments or compensation will be allowed for losses caused by failure to comply with this requirement. Boring logs and other records of subsurface investigations may be available for inspection by bidders. Bidders shall request such records if

they are not otherwise provided with bid documents. If available, it is understood that such information was obtained and is intended for the City of Huntsville's design and estimating purposes only. It is made available to bidders that they may have access to identical subsurface information available to the City, and is not intended as a substitute for personal investigation, interpretations and judgment of the bidders. Bidders are advised that the City disclaims responsibility for any opinions, conclusions, interpretations, or deductions that may be expressed or implied in any of the information presented or made available to bidders; it being expressly understood that the making of deductions, interpretations, and conclusions from all of the accessible factual information is the bidder's sole responsibility.

The Contractor shall have a continuing duty to read, carefully study and compare each of the Contract Documents, the Shop Drawings, and the Product Data and shall give written notice to the Owner of any inconsistency, ambiguity, or error omission which the Contractor may discover with respect to these documents before proceeding with the affected work. The issuance or the express or implied approval by the Owner or the Engineer of the Contract Documents, Shop Drawings, or Product Data shall not relieve the Contractor of the continuing duties imposed hereby, nor shall any such approval be evidence of the Contractor's compliance with this Contract. The Owner has requested the Engineer to only prepare documents for the Project, including drawings and specs for the project which are accurate, adequate, consistent, coordinated and sufficient for construction. HOWEVER, the OWNER MAKES NO REPRESENTATION OR WARRANTY OF ANY NATURE WHATSOEVER TO THE CONTRACTOR CONCERNING SUCH DOCUMENTS. By the execution hereof, the Contractor acknowledges and represents that it has received, reviewed, and carefully examined such documents, has found them to be complete, accurate, adequate, consistent, coordinated and sufficient for construction, and that the Contractor has not, does not, and will not, rely upon any representation or warranties by the Owner concerning such documents as no such representation or warranties have been or are hereby made.

**15. INCLUSIONS TO CONTRACT**

The parties further agree that the advertisement for bids, instructions to bidders, contractor's proposal, plans and specifications, general requirements, supplement to general requirements and general terms and conditions, together with any addenda thereto, made prior to submission of the contractor's proposal and all modifications agreed to by the parties and issued after the execution of this contract are a part of this contract as if fully set out herein.

**16. COMMENCEMENT OF WORK**

It is further understood and agreed that the Contractor shall commence work to be performed under this contract within fifteen (15) days from the date of this contract, unless otherwise instructed in writing by the OWNER. All work shall be carried on continuously to completion.

**17. CONTRACT TIME**

All work is to be completed within the allotted time of the original contract, which is stated in the bid proposal documents, unless a valid change order has been issued which alters the contract time period.

**18. LIQUIDATED DAMAGES**

It is further understood and agreed by and between the parties to this contract, that in the event the work to be performed under this contract is not completed at the expiration of the contract time, then, and in that event, the Contractor shall pay to the City the amounts per calendar day by the schedule shown in the schedule in the City of Huntsville Standard Specifications, Section 80.11 - "Schedule of Liquidated Damages" for each day thereafter until such work is completed. The City will deduct said sum or sums from any money due the Contractor under this contract for any and all invoices submitted after the contract due date. (See Section 12.). Attachment "F" - Sample of Request for Payment with Liquidated Damages shall become a part of the contract documents. Liquidated damages will be deducted from all invoices when the invoice estimate period end date is later than the contract completion date.

**Section 80.11 - "Schedule of Liquidated Damages" has been amended as follows effective 2/1/11 and revised in COH specifications 3/7/11:**

| Original Contract Amount |                  | Liquidated Damages Daily Charge |          |
|--------------------------|------------------|---------------------------------|----------|
| More Than                | To and Including | Calendar Day or Fixed Date      | Work Day |
| \$ 0                     | \$ 100,000       | \$ 200                          | \$ 400   |
| \$ 100,000               | \$ 500,000       | \$ 550                          | \$ 1,100 |
| \$ 500,000               | \$ 1,000,000     | \$ 900                          | \$ 1,800 |
| \$ 1,000,000             | \$ 2,000,000     | \$ 1,350                        | \$ 2,700 |
| \$ 2,000,000             | .....            | \$ 1,550                        | \$ 3,100 |

When the contract time is on the calendar day or date basis, the schedule for calendar days shall be used. When the contract time is on a work day basis, the schedule for work days shall be used.

Amounts in accordance with ALDOT and COH specifications and is based on contract amount before Change Orders.

#### **19. STORAGE OF MATERIALS**

The Contractor shall not permit the storage of materials on or use of any property outside the right-of-way easement or property identified as the project site.

#### **20. TRAFFIC FLOW**

The Contractor shall be responsible for the uninterrupted, orderly and safe flow of traffic around, on, over or across the project site.

#### **21. TERMINATION FOR CONVENIENCE**

A. The City may for any reason whatever terminate performance under this Contract in whole or in part by the Contractor for convenience. The City shall give written notice of such termination to the Contractor specifying when the full or partial termination becomes effective.

B. The Contractor shall incur no further obligations in connection with the Work and the Contractor shall stop Work when such termination becomes effective. The Contractor shall also terminate outstanding orders and subcontracts and shall not purchase any additional supplies, equipment or materials for the Work, and shall make every effort to mitigate the costs of termination. The Contractor shall settle the liabilities and claims arising out of their termination of subcontracts and orders. The City may direct the Contractor to assign the contractor's right, title and interest under terminated orders or subcontracts to the City or its designee and may direct the Contractor to take steps to preserve the Work in place at the time of the termination.

C. The Contractor shall transfer title and deliver to the Owner such completed Work and materials, equipment, parts, fixtures, information and Contract rights as the Contractor has.

D. (1) The Contractor shall submit a termination claim to the City and the Consultant specifying the amounts due because of the termination for convenience together with costs, pricing or other data required by the City. If the Contractor fails to file a termination claim within six (6) months from the effective date of termination, the owner shall pay the Contractor, an amount derived in accordance with subparagraph (3) below.

(2) The City and the Contractor may agree to the compensation, if any, due to the Contractor hereunder.

(3) Absent agreement to the amount due to the Contractor, the City shall pay the Contractor the following amounts:

(a) Contract prices for labor, materials, equipment and other services accepted under this Contract.

(b) Reasonable costs incurred in preparing to perform and in performing the terminated portion of the work, and in terminating the Contractor's performance, plus a fair and reasonable allowance for overhead and profit thereon (such profit shall not include anticipated profit or consequential damages); provided, however, that if it appears that the Contractor would not have profited or would have sustained a loss if the entire Contract would have been completed, no profit shall be allowed or included and the amount of compensation shall be reduced to reflect the anticipated rate of loss, if any. Costs incurred in performing the terminated portion of the work must have been incurred prior to the effective date of the termination.

(c) Reasonable costs of settling and paying claims arising out of the termination of subcontracts or orders pursuant to Paragraph B of this clause. These costs shall not include amounts paid in accordance with other provisions hereof.

The Total Sum to be paid the Contractor under this clause shall not exceed the total Contract Price, as properly adjusted, reduced by the amount of payments otherwise made, and shall in no event include duplication of payment.

The Owner specifically reserves the right to convert a termination for convenience into a termination for cause within one (1) year after the effective date of the termination for convenience, in the event that the Owner becomes aware of circumstances or conditions with regards to the Work that would have warranted the Owner terminating for default, had those circumstances or conditions been properly known by the Owner, at the time of the termination for convenience. The Owner may, upon written notice to the Contractor of its intention to convert the termination for convenience to a termination for cause, initiate the

termination for cause procedures at that time, as set forth in the Performance Bond, and the termination for convenience shall then be converted to a termination for cause.

## **22. TERMINATION FOR CAUSE**

- A. If the Contractor persistently or repeatedly refuses or fails to prosecute the work in a timely manner, supply enough properly skilled workers, supervisory personnel or proper equipment or material, or if it fails to make prompt payment to Subcontractors or for materials or labor, or persistently disregards laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction, or otherwise is guilty of a substantial violation of a material provision of this Contract, then the Owner may, by written notice to the Contractor, without prejudice to any other right or remedy, terminate the employment of the Contractor and take possession of the site and of all materials, equipment, tools, construction equipment, and machinery thereon owned by the Contractor and may finish the Work by whatever methods it may deem expedient. In such case, the Contractor shall not be entitled or receive any further payment until the Work is finished.
- B. If the unpaid balance of the Contract Price exceeds the cost of finishing the work, including compensation for the additional professional services and expenses made necessary thereby, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the City. This obligation for payment shall survive the termination of the Contract.
- C. In the event the employment of the Contractor is terminated by the City for cause pursuant to Paragraph A and it is subsequently determined by a court of competent jurisdiction that such termination was without cause, such termination shall thereupon be deemed a Termination for Convenience and the provisions of the Termination for Convenience clause shall apply.

## **23. UNBALANCED BIDS**

The City may reject a bid as nonresponsive if the prices bid are materially unbalanced between line items. A bid is materially unbalanced when it is based on prices which are significantly overstated or understated in relation to cost for other work, and if there is a reasonable doubt that the bid will result in the lowest overall cost to the City even though it may be the low evaluated bid.

## **24. ADDITIONAL INSURANCE REQUIREMENTS**

The Contractor shall carry insurance of the following kinds and amounts in addition to any other forms of insurance or bonds required under the terms of the contract specifications. The Contractor shall procure and maintain for the duration of the job until final acceptance by the Owner, or as later indicated, insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his agents, representatives, employees or subcontractors.

### **A. MINIMUM SCOPE OF INSURANCE**

#### **1. General Liability**

Insurance will be written on an occurrence basis. Claims-made coverage will be accepted only on an exception basis after the Owner's approval. General Liability Coverage and Owners Contractors Protective Insurance should be written by this same insurance company.

Commercial General Liability

Products and Completed Operations

Contractual

Personal Injury

Explosion, Collapse and Underground

Broad Form Property Damage

#### **2. Professional Liability**

N/A

#### **3. Automobile Liability**

Business Automobile Liability providing coverage for all owned, hired and non-owned autos. Coverage for loading and unloading shall be provided under either automobile liability or general liability policy forms.

4. **Worker's Compensation Insurance**

Statutory protection against bodily injury, sickness or disease or death sustained by employee in the scope of employment. Protection shall be provided by a commercial insurance company or a recognized self-insurance fund authorized before the State of Alabama Industrial Board of Relations.

5. **Employers Liability Insurance**

Covering common law claims of injured employees made in lieu of or in addition to a worker's compensation claim.

**B. MINIMUM LIMITS OF INSURANCE**

1. **General Liability**

Commercial General Liability on an occurrence form for bodily injury and property damage:

|             |                                           |
|-------------|-------------------------------------------|
| \$2,000,000 | General Aggregate Limit                   |
| \$2,000,000 | Products - Completed Operations Aggregate |
| \$1,000,000 | Personal and Advertising Injury           |
| \$1,000,000 | Each Occurrence                           |

2. **Professional Liability**

N/A

3. **Automobile Liability**

\$1,000,000 Combined Single Limit per accident for bodily injury and property damage.

4. **Worker's Compensation**

As required by the State of Alabama Statute.

5. **Employers Liability**

|           |                         |
|-----------|-------------------------|
| \$100,000 | Bodily Injury           |
| \$500,000 | Policy Limit by Disease |

**C. OTHER INSURANCE PROVISIONS**

The Owner is hereby authorized to adjust the requirements set forth in this document in the event it is determined that such adjustment is in the Owner's best interest. If the insurance requirements are not adjusted by the Owner prior to the Owner's release of specifications with regard to the project in question, then the minimum limits shall apply.

The policies are to contain, or be endorsed to contain, the following provisions:

1. **General Liability and Automobile Liability Coverages Only:**

a. The Owner, its officers, employees, agents and specified volunteers are to be covered as Additional Insureds, as their interest may appear, as respects: liability arising out of activities performed by or on behalf of the contractor, architect, engineer, land surveyor or consulting firm for products used by and completed operations of the Contractor, or automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the Owner, its officers, employees, agents or specified volunteers.

b. The Contractor's insurance coverage shall be primary insurance as respects the Owner, its officers, employees, agents, and specified volunteers, as their interest may appear. Any insurance or self-insurance maintained by the Owner, its officers, officials, employees, agents or specified volunteers shall be excess of the Contractor's insurance and shall not contribute to it.

c. The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

2. **All Coverages**

a. The Contractor is responsible to pay all deductibles. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits

except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the Owner. Cancellation of coverage for non-payment of premium will require ten (10) day's written notice to the Owner.

b. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the Owner, its officers, employees, agents or specified volunteers.

#### **D. ACCEPTABILITY OF INSURERS**

Insurance is to be placed with insurers with an A. M. Best's rating of no less than B + V.

#### **E. VERIFICATION OF COVERAGE**

The Owner shall be indicated as a Certificate Holder and the Contractor shall furnish the Owner with Certificates of Insurance reflecting the coverage required by this document. The A.M. Best Rating and deductibles, if applicable, shall be indicated on the Certificate of Insurance for each insurance policy. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. All certificates are to be received and approved by the Owner before work commences. The Owner reserves the right to require complete, certified copies of all required insurance policies at any time. Certificates signed using digital signatures will not be accepted unless accompanied by a written statement from the insurance/surety company indicating that their electronic signature is intended as their signature.

#### **F. SUBCONTRACTOR WORKING FOR GENERAL CONTRACTOR, OR ARCHITECT, ENGINEERS, LAND SURVEYORS OR CONSULTING FIRMS WORKING FOR THE ENGINEER OF RECORD**

The Contractor shall include all subcontractors as insured under its policies or shall furnish separate certificates and/or endorsements for each subcontractor. The Engineer of Record shall include all architects, engineers, land surveyors or consulting firms as insured under its policies other than professional liability, or shall furnish separate certificates and/or endorsements for each architect, engineer, land surveyor or consulting firm. Subcontractors working for the contractor or architects, engineers, land surveyors, or consulting firms working for the Engineer or Record shall be required to carry insurance.

#### **G. HOLD HARMLESS AGREEMENT**

##### **1. Other Than Professional Liability Exposures**

The Contractor, architect, engineer, land surveyor or consulting firm, to the fullest extent permitted by law, shall indemnify and hold harmless the City of Huntsville, its elected and appointed officials, employees, agents and specified volunteers against all claims, damages, losses and expenses, including, but not limited to, attorney's fees, arising out of or resulting from the performance of the work, provided that any such claim, damage, loss or expense (1) is attributable to personal injury, including bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, including loss of use resulting therefrom and (2) is caused by any negligent act or omission of the contractor, architect, engineer, land surveyor or consulting firm, or any of their subcontractors, subconsultants, or anyone directly or indirectly employed by any of them or anyone for whose acts they are legally liable. Such obligation should not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this paragraph.

2. The architect, engineer, land surveyor or consulting firm agrees that as respects to negligent acts, errors, or omissions in the performance of professional services, to indemnify and hold harmless the City of Huntsville, its officers, agents, employees, and specified volunteers from and against any and all claims, demands, losses and expenses including, but not limited to attorney's fees, liability, or consequential damages of any kind or nature resulting from any such negligent acts, errors, or omissions of the architect, engineer, land surveyor or consulting firm or any of their subconsultants, or anyone directly or indirectly employed by any of them or anyone for whose acts they are legally liable.

#### **25. DOMESTIC PREFERENCES**

In the performance of this contract, the contractor shall comply with Ala Code (1975) §§ 39-3-1 through 39-3-5 in supplying steel, materials, supplies, other products, and labor. Failure to comply with these requirements shall subject the contractor to the penalties set forth in the sections of the Alabama Code set forth above.

#### **26. TIME IS OF THE ESSENCE**

Time is of the essence in the performance of this contract.

#### **27. NO DAMAGES FOR DELAYS**

In the event that the Contractor is delayed in the performance of the work for the reasons set forth in §80.09 of the City of Huntsville's Standard Specifications for the Construction of Public Improvements, Contract Projects, 1991, then the Contractor's recovery for such delay shall be limited to the extensions of time in contract performance in accordance with the

provisions of §80.09 and in §4(c) "Changes in Contract Time" as set forth in the Request for Bids.

In such circumstances, time extensions are the sole remedy provided to the Contractor. The Contractor shall make no claim for extra compensation due to delays of the project beyond his control. Such delays may include those caused by an act of neglect on the part of the owner or the engineer, or by an employee of either, or by any separate contractor employed by the Owner, or by any changes ordered in the work, or by labor disputes, fire, unusual delays in transportation, adverse weather condition not reasonably anticipatable, unavoidable casualties, or by delay specifically authorized by the Owner in writing pending the resolution of any disputes, or by any other cause which the Owner determines may justify delay.

#### **28. CONTRACTOR RESPONSIBLE FOR LOCATING UTILITIES PRIOR TO CONSTRUCTION INITIATION**

The Contractor's attention is specifically directed to §50.07 -Cooperation with Utilities and Non-Highway Public Facilities of the City of Huntsville's Standard Specifications for the Construction of Public Improvements, Contract Projects, 1991. In addition to the responsibilities placed on the Contractor by that clause, the Contractor shall be responsible for having existing utilities located prior to excavations. The existence and location of any underground utility pipes or structures shown on these drawings have been obtained by a search of the available records. The City assumes no responsibility as to completeness or accuracy of the depicted location on these drawings. The Contractor shall be responsible for taking precautionary measures to protect the utility lines shown and all other lines not of record or not shown on these drawings by verification of their location in the field prior to the initiation of the work.

#### **29. CORRECTION TO CITY OF HUNTSVILLE'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF PUBLIC IMPROVEMENTS, CONTRACT PROJECTS, 1991**

§80.09 (b) 2. of the City of Huntsville's Standard Specifications for the Construction of Public Improvements, Contract Projects, 1991 refers to the definition of recovery time as being set forth in Section 10.01. Inasmuch as this definition was omitted from §10.01, the following definition shall be incorporated:

**Recovery Time.** Recovery time is defined as the time required, after the controlling item or items of work have been substantially damaged as a result of conditions and causes beyond the control of the Contractor and not due to his negligence of fault, to restore the work to the condition existing prior to such damage so that normal operations can be resumed on the contract pay items. Recovery time shall be the number of days required by the Contractor, working with normal forces, to restore the work as described above.

#### **30. WARRANTIES**

Contractor shall provide a minimum of one year warranty of all materials and services from date of final completion. Additionally, all manufacturer's warranties on materials used in providing the services shall be provided to the owner with the final payment request. Separate warranty bonds may be required on specialty items as determined by the Owner and will be shown as a separate line item in the quantities prior to bidding.

#### **31. COORDINATION WITH OTHER CONTRACTORS**

It shall be the responsibility of the contractor to coordinate with other separate contractors who may be working on the site or an adjacent site with regards to access to the site, storage of materials and working on a non-interference basis.

#### **32. W-9 TAXPAYER FORM**

All vendors/contractors are required to submit a Federal Tax Form W-9 to City of Huntsville at the time a contract is awarded, unless vendor/contractor is already registered and doing business with the City. No payments of invoices can be made until this W-9 Tax Form has been properly submitted. A copy of the W-9 Tax Form can be obtained at the following website: [www.irs.ustreas.gov/pub/irs-pdf/fw9.pdf](http://www.irs.ustreas.gov/pub/irs-pdf/fw9.pdf)

#### **33. FINAL PAYMENT**

Final payment to construction contractor will be made after contractor provides the following: advertising of completion for four (4) consecutive weeks, lien waivers have been provided from all subcontractors, Record Drawings (As-Builts) have been submitted to the OWNER by construction contractor, all property pins have been reset by a licensed land surveyor hired by the construction contractor to meet "Standards of Practice for Surveying in the State of Alabama" as required by the Alabama Board of Registration for Engineering and Land Surveyors, and all construction signs have been removed. This final payment will be retainage only. All work shall be complete prior to advertisement of completion. Advertisement of completion shall be in a Huntsville local newspaper. The final payment request of retainage only shall be submitted along with two (2) original, certified copies (with raised notary seal) of the advertisement of completion, warranties, lien waivers and Record Drawings.

The advertisement of completion must read as follows:

LEGAL NOTICE (Header)

(company name) hereby gives Legal Notice of Completion of Contract with (project name), (project no.(s)) located in the City of Huntsville, Alabama. All claims should be filed at (company address) during this period of advertisement, i.e. June 17, 24, July 1, 8, 2011 (example of dates).

**34. PROJECT COMPLETION DATE**

The project completion date will be a date mutually agreed upon by the OWNER and Contractor. This date will be after all items have been completed. Therefore, all work will be complete before any advertisement of completion is made. The completion date will always be before the first advertisement date. This final project completion date will be the date used to determine the one year warranty for all work and materials, unless a separate warranty bond has been called for as a line item prior to bidding.

**35. RECORD DRAWINGS**

**POLICY FOR RECORD DRAWINGS**

The purpose of this policy is to document procedures for the preparation and delivery of Record Drawings. Record Drawings shall include all changes in the plans, including those issued as Change Orders, Plan Clarification, Addenda, Notice to Bidders, responses to Requests for Information, Jobsite Memos, and any additional details needed for the construction of the project, but not shown on the plans. After completion of all construction and before final acceptance is made, the Contractor shall submit one set of full size record drawings with dimensioned changes shown in red pencil, and one digital copy of record drawings using the criteria listed below.

**City Construction Projects:**

The Contractor shall be responsible for field surveying upon substantial completion of construction (to be performed by a registered land surveyor in Alabama). Contractor is responsible for providing digital record drawings showing all info specified below, as applicable. Record drawings shall be maintained by the Contractor at the work site and shall be updated based on job progress to reflect all changes. Record drawings shall be made available for review on a monthly basis at the job site. A monthly review of record drawings will be part of the monthly monetary progress review. Progress payments may be withheld if the Record Drawings are not kept up-to-date. A late review could result in a delay of payment.

**Format Requirements for all record drawing submittals:**

All drawings shall be prepared in Micro Station .DGN format, unless otherwise approved by the City Engineer. Transmittal letters shall consist of a list of files being submitted, a description of the data in each file, and a level/layer schematic of each design file. DGN design files should have working units as follows: master units in feet, no sub-units, and 1,000 positional units. All data submitted shall use NAD 1983 Alabama East Zone coordinates as described in The Code of Alabama (1975), section 35-2-1 and NGVD 1929. Digital files shall be submitted on 4-3/4" CD-RW (preferably in a live/flash drive format) ROM, 100 MB zip drive, 3 and 1/2 inch floppy disk, or to the City of Huntsville F.T. P. Site. Contractor is required to certify that record drawings are in the correct format upon submittal. Record Drawings shall be prepared and provided to the OWNER in the manner required and described below in Level Symbolology.

**Record Drawing Criteria, unless otherwise noted by City Engineer:**

1. **Roadways:**
  - a. Any changes during construction of roadway/intersections that differ from plan drawings.
2. **Sanitary Sewers:**
  - a. Gravity Line
    - i. Horizontal Location of Manholes – Northing and easting Coordinates
    - ii. Vertical Location of Manholes – Lid elevation and invert elevation.
    - iii. Changes in location of clean outs, or end of service lateral.
    - iv. Changes in length, slope, size, or material of lines.
  - b. Force Mains
    - i. Horizontal Location of Air Relief/Vacuum/Isolation Valves – Northing and easting Coordinates
    - ii. Horizontal and Vertical Location of Fittings/Bends
    - iii. Changes in length, size, depth or material of lines
    - iv. Changes in restraint types
  - c. Pump Stations
    - i. Changes in Structural Requirements – (length, width, thickness, cover, laps, bar size, spacing, materials, material strengths, etc.)

- ii. Changes in Site Development and/or Landscaping
- iii. Changes in Equipment

**3. Storm Drainage:**

- a. Structures (boxes, inlets, end treatments, etc.):
  - i. Horizontal locations of Features – Northing and easting coordinates
  - ii. Vertical location of Features – Tops and Inverts
  - iii. Changes in type, size, or material of feature.
- b. Pipes / Culverts:
  - i. Document length
  - ii. Document slope
  - iii. Document size
  - iv. Document invert elevation
  - v. Changes in material of structure
- c. Flumes, Ditches, and/or Swales/Berms: (the following are minimum requirements).
  - i. Horizontal location (to verify location within described easements)

|                                        |                                                        |
|----------------------------------------|--------------------------------------------------------|
| For easement widths less than 15- feet | At 100-foot intervals along the centerline of feature. |
| For easement widths 15-feet or Greater | At 200-foot intervals along the centerline of feature. |

- ii. Vertical location (to verify positive drainage)

|                            |                                                        |
|----------------------------|--------------------------------------------------------|
| For slopes less than 0.5%  | At 50-foot intervals along the centerline of feature.  |
| For slopes 0.5% or greater | At 100-foot intervals along the centerline of feature. |

- iii. Changes in width or material of feature.
- iv. Changes in location and type of geotechnical fabric used.
- v. Changes in overall grading of site topography.

**d. Detention / Retention Facility:**

- i. Changes in size, location, or material of facility.
- ii. Changes in location and type of geotechnical fabric used.
- iii. Where applicable, copy of maintenance agreement.

**Checklist for review of record drawings:**

- a. Changes in sidewalk location or size.
- b. Changes in shoulder widths.
- c. Changes in grades at Intersections. (also to include changes in island location)
- d. Changes in location of driveway aprons.
- e. Changes in pavement section, to be supported by adequate documentation.
- f. Changes in gutter flow line elevation. (could be substituted in 3b) versus edge of pavement).
- g. Geotechnical fabric locations, to include vertical elevation.
- h. Changes in Traffic Engineering related items such as signals, signage and markings, etc.

Any other changes that may have occurred during construction.

**LEVEL SYMBOLOGY**

| DESIGN LEVEL | CONTENTS                    | LINE CODE | COLOR | WEIGHT | TEXT SIZE | FONT | CELL NAME |
|--------------|-----------------------------|-----------|-------|--------|-----------|------|-----------|
| 1            | State Plane Coordinate Grid | 0         | 0     | 0      | 20        | 0    |           |
| 2            | Benchmarks                  | 0         | 0     | 0      |           |      |           |
| 3            | Street Text                 | 0         | 3     | 0      | 20        | 0    |           |
| 4            | Street R/W                  | 7         | 0     | 0      |           |      |           |
| 5            | Street Centerline           | 7         | 0     | 0      |           |      |           |
| 6            | Street Pavement             | 0         | 3     | 0      |           |      |           |
| 6            | Proposed Street Pavement    | 3         | 16    | 0      |           |      |           |
| 7            | Parking Lots                | 1         | 3     | 1      |           |      |           |
| 8            | Secondary Roads             | 2         | 3     | 0      |           |      |           |

|    |                                                        |   |     |   |      |    |               |
|----|--------------------------------------------------------|---|-----|---|------|----|---------------|
| 8  | Trails                                                 | 3 | 3   | 0 |      |    |               |
| 9  | Secondary Roads/Trails Text                            | 0 | 3   | 0 | 20   | 0  |               |
| 10 | Sidewalks                                              | 5 | 3   | 0 |      |    |               |
| 11 | Bridges/Culverts                                       | 0 | 0   | 0 |      |    |               |
| 12 | Hydrology - Major                                      | 6 | 1   | 0 |      |    |               |
| 12 | Hydrology - Minor, Ditches                             | 7 | 1   | 0 |      |    |               |
| 13 | Hydrology - Text                                       | 0 | 1   | 0 | 25   | 23 |               |
| 14 | Tailings & Quarries, Athletic Fields/Text, misc. areas | 0 | 1   | 0 |      |    |               |
| 15 | City Limits/County Line                                | 1 | 0   | 3 |      |    |               |
| 16 | City /limit text                                       | 0 | 0   | 1 | 30   | 0  |               |
| 17 | Railroad Tracks (Patterned)                            | 0 | 2   | 0 |      |    | RR            |
| 18 | Railroad Text                                          | 0 | 2   | 0 | 25   | 0  |               |
| 19 | Railroad R/W                                           | 2 | 2   | 0 |      |    |               |
| 20 | Utility Poles (Cell)                                   | 0 | 5   | 0 |      |    |               |
| 21 | Utility Easements                                      | 3 | 5   | 0 |      |    | P POLE        |
| 22 | Utility Text                                           | 0 | 5   | 1 |      |    |               |
| 23 | Geographic Names                                       | 0 | 3   | 1 |      |    |               |
| 24 | Building Structures                                    | 0 | 0   | 0 |      |    |               |
|    | Pools and Text                                         | 0 | 1   | 0 | 10   | 1  |               |
| 24 | Future Site of Structures                              | 2 | 0   | 0 |      |    | STRUCT        |
|    | Existing Structures (exact location and shape unknown) | 2 | 0   | 0 |      |    | STRCEX        |
| 25 | Property Lines                                         | 6 | 6   | 1 |      |    |               |
| 26 | Cadastral Polygons                                     | 6 | 6   | 0 |      |    |               |
| 27 | Ownership Text                                         | 0 | 6   | 1 |      |    |               |
| 28 | Cemeteries/Text                                        | 4 | 6   | 0 | 10   | 1  |               |
| 29 | Lot Numbers                                            |   |     |   | 25   | 0  |               |
| 30 | Block Numbers                                          |   |     |   | 30   | 0  |               |
| 31 | Addition Names                                         | 0 | 0   | 0 | 35   | 0  |               |
| 32 | Open                                                   |   |     |   |      |    |               |
| 33 | Lot Ticks                                              |   |     |   |      |    |               |
| 34 | Lot Lines/Property Lines                               | 6 | 6   | 0 |      |    |               |
| 35 | Trees/Hedge Rows                                       | 0 | 6   | 0 | AS=1 |    | TREES         |
| 36 | GPS Monuments                                          | 0 | 5   | 0 | 15   | 0  | GPS           |
| 37 | 2' Topo Contour                                        |   |     |   |      |    |               |
| 38 | 5' Topo Contour                                        | 0 | 7   | 0 |      |    |               |
| 39 | 25' Major Topo Contour                                 | 0 | 7   | 0 |      |    |               |
| 40 | X Spot Elevation                                       | 0 | 7   | 0 |      |    |               |
| 41 | FEMA Monuments/Labels                                  | 0 | 3/0 | 0 | 18   | 1  | GPSPNT        |
| 42 | Quarter Sections                                       |   |     |   |      |    |               |
| 43 | Section Lines                                          | 0 | 5   | 0 |      |    |               |
| 44 | Features                                               | 0 | 2   | 0 |      |    |               |
| 44 | Cell Towers                                            | 0 | 12  | 0 | AS=1 |    | CELTWR        |
| 45 | Fences (Pattern)                                       | 0 | 8   | 0 | AS=1 |    | FENCE         |
| 46 | Format/Legend                                          | 0 | 0   | 0 |      |    | Limleg Madleg |
| 47 | Mass Points                                            | 0 | 7   | 2 |      |    |               |
| 48 | Break Lines                                            | 0 | 7   | 2 |      |    |               |
| 49 | Open                                                   |   |     |   |      |    |               |
| 50 | Signs                                                  |   |     |   |      |    |               |
| 51 | Open                                                   |   |     |   |      |    |               |
| 52 | Open                                                   |   |     |   |      |    |               |
| 53 | Open                                                   |   |     |   |      |    |               |

|    |                                  |   |   |   |       |   |
|----|----------------------------------|---|---|---|-------|---|
| 54 | Open                             |   |   |   |       |   |
| 55 | Open                             |   |   |   |       |   |
| 56 | Property Address                 | 0 | 1 | 0 |       |   |
| 57 | Text Tag for Buildings           | 0 | 1 | 0 | 10-20 | 1 |
| 58 | Open                             |   |   |   |       |   |
| 59 | Open                             |   |   |   |       |   |
| 60 | Open                             |   |   |   |       |   |
| 61 | Open                             |   |   |   |       |   |
| 62 | Monuments for Setup (point call) |   |   |   |       |   |
| 63 | Open                             |   |   |   |       |   |

**36. LIEN WAIVERS**

Lien waivers will be required from all subcontractors working for the contractor. These lien waivers shall be included with your final payment package. The contractor is responsible for obtaining signatures from his subcontractors. If no subcontractors are used, contractor must provide a statement indicating such.

**37. LOWEST RESPONSIBLE BIDDER**

For the purpose of determining the lowest responsible bidder, the OWNER shall consider the base bid amount together with any options set forth in the Request for Bids. In the event that the City does not have sufficient funds to award both the base bid and all options, then the City reserves the right to determine the lowest responsible bidder on the base bid only or the base bid and the number of options affordable considering the funds available to the City for the procurement. This method for determining the low bidder is for the purpose of allowing the City to procure the most advantageous bid for the OWNER. City of Huntsville reserves the right to award any and/or all options at any time during the life of the contract.

**38. NON-RESIDENT BIDDERS**

"In awarding the Contract, preference will be given to Alabama resident contractors and a nonresident bidder domiciled in a state having laws granting preference to local contractors shall be awarded the Contract only on the same basis as the nonresident bidder's state awards contracts to Alabama contractors bidding under similar circumstances."

**39. CORRECTION TO SECTION 80.08(C) of The City of Huntsville "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC IMPROVEMENTS" is revised as shown:**

(C) DAYS WORK NOT PERMITTED: The Contractor shall not permit work on any pay item to be done on Sundays and the following holidays: New Year's Day, Martin Luther King's Birthday as nationally observed, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day and Christmas Day, except with permission of the Director.

**40. CORRECTION TO SECTION 80 - of The City of Huntsville "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC IMPROVEMENTS" - PROSECUTION AND PROGRESS 80.01 Subletting and Contract. (a) LIMITATIONS**

The Contractor shall not sublet the contract or any portion thereof, or of his right, title, or interest therein, without written consent of the DIRECTOR. If such consent is given, the Contractor will be permitted to sublet a portion of the work, but shall perform with his own organization, work amounting to not less than 30 percent of the total contract cost. Any items designated in the contract as "specialty items" may be performed by sub-contract and the cost of such specialty items performed by sub-contract may be deducted from the total cost before computing the amount of work required to be performed by the contractor with his own organization. No sub-contracts, or transfer of contract, shall relieve the Contractor of his liability under the contract and bonds. The Department reserves the right to disapprove a request for permission to sublet when the proposed Subcontractor has been disqualified from bidding for those reasons listed in Subarticle 20.02(b) and Article 30.03.

**41. CORRECTION TO SECTION 80 - of The City of Huntsville "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC IMPROVEMENTS" - PROSECUTION AND PROGRESS 80.03 Progress Schedule of Operations**

A critical path schedule is required within thirty (30) days after award. The critical path schedule must be submitted in Microsoft Projects format (electronic format and hard copy), with the critical path highlighted. The critical path schedule shall show information on the task or tasks that must be finished on schedule for the project to finish on schedule. Task dependencies, constraints, and relationships shall be shown on the schedule. If the progress report (critical path) is not received, YOUR first pay estimate will NOT BE PROCESSED UNTIL IT IS RECEIVED). See section 80.03 and 80.04 for additional requirements.

**42. CORRECTION TO SECTION 80 – of The City of Huntsville "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC IMPROVEMENTS" PROSECUTION AND PROGRESS 80.09 (b) Contracts on a Calendar Day or Calendar Date Basis**

§80.09 (b) – Change 10 calendar days to 15 calendar days at each occurrence within section 80.09(b).

Section 80.09(B) is revised to remove the last sentence of the first paragraph: ( "Also where the total cost of the completed work exceeds the total cost shown on the proposal, an extension in calendar days will be granted the Contractor, as provided in Section 80.09(a)1." ) It is replaced by: "Where the scope of work is increased, an extension of time commensurate with the scope of the change may be granted by the OWNER, when in his judgment, the facts justify an extension. The contractor shall provide justification substantiated to the satisfaction of the OWNER with any requests for time extensions. Justification shall include, but not be limited to, a revised schedule showing the impact to critical path tasks."

**43. CORRECTION TO SECTION 105 – of The City of Huntsville "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC IMPROVEMENTS" - EXCAVATION AND EMBANKMENT 105.04 (a) Method of Measurement**

Section 105.04 will remain as stated when estimated borrow material is less than 2500 C.Y.

When estimated borrow material is more than 2500 C.Y., Section 105.04 is revised to remove the last paragraph: "Borrow material will be measured at the point of delivery, inside the delivery truck less 30 percent for shrinkage."

**44. CORRECTION TO SECTION 847 – of The City of Huntsville "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC IMPROVEMENTS" - PIPE CULVERT JOINT SEALERS**

Section 847 is deleted and replaced with Section 846 – Pipe Culvert Joint Sealers, ALDOT Specifications for Highway Construction, Current Edition.

**45. NPDES CONSTRUCTION REQUIREMENTS**

For areas of this project meeting the Alabama Department Of Environmental Management (ADEM) definition of a "Construction Site", the Contractor shall prepare and apply for, pay the necessary fees, post the required registration at the jobsite prior to commencing work, and maintain the worksite and records in accordance with the ADEM requirements for National Pollutant Discharge Elimination System (NPDES) registration. Offsite borrow pits utilized in the construction of this project are included in the requirement. NPDES Construction Site is construction that disturbs one (1) acre or greater or will disturb less than one (1) acre but is part of a larger common plan of development or sale whose total land disturbing activities total one (1) acre or greater. An NPDES construction site also includes construction sites, irrespective of size, whose stormwater discharges have a reasonable potential to be a significant contributor of pollutants to a water of the State, or whose stormwater discharges have a reasonable potential to cause or contribute to a violation of an applicable Alabama water quality standard as determined by the Department. The Contractor is referred to the "Alabama Department Of Environmental Management Field Operations Division – Water Quality Program - Division 335 – 6" for complete definitions and requirements. The Contractor is also referred to Item 11 of these General Requirements, sections 50.15, 50.16, and 70.02 of the City of Huntsville Standard Specifications For Construction Of Public Improvements, Contract Projects (Specifications).

Contractor violations of the permit by rule which results in enforcement actions from ADEM including fines and/or work stoppage shall be the responsibility of the Contractor. Fines assessed to the Contractor or the OWNER because of Contractor action shall be paid by the Contractor. No extension of contract time shall be considered as a result of enforcement. Enforcement history will also be considered by the OWNER in its decision to issue future proposals or award future contracts in accordance with disqualification provisions of Section 20.02(b) of the Specifications.

**46. DELETION OF SECTION 50.01 – Authority of the Engineer of Record**  
This section is deleted.

**47. SHOP DRAWINGS**

The approval of shop drawings by the Engineer will cover only the features of the design and in no case shall this approval be considered to cover error or omissions in shop details or a check of any dimensions. The Contractor shall be responsible for the accuracy of the shop drawings, the fabrication of materials and the fit of all connections; and he shall bear the cost of all extra work in erection caused by errors in shop drawings or in fabrication, inaccurate workmanship, misfits of connections or for any changes in fabrication necessary. No work shall be done on the material before the shop drawings have been approved. Any material that the Contractor orders prior to the approval shall be at the Contractor's risk.

Substitutions or changes whether indicated or implied on shop drawings will not be considered as changes regardless of the Engineer's approval of shop drawings unless the change has been previously submitted and approved as a change order per the requirements for changes in the contract.

After a shop drawing has been approved, no changes shall be made unless directed in writing to the Owner and acceptance by the Owner of said changes. Any acceptance of change by the Owner does not constitute a change to the contract unless that change has been approved and directed in writing per change order. Compensation for preparing and furnishing all shop and working drawings shall be included in the contract unit prices for the various pay items of work.

#### **48. E-VERIFY – NOTICE**

The Beason-Hammon Alabama Taxpayer and Citizen Protection Act, Act No. 2011-535, Code of Alabama (1975) § 31-13-1 through 31-13-30 (also known as and hereinafter referred to as "the Alabama Immigration Act") as amended by Act No. 2012-491 on May 16, 2012 is applicable to all competitively bid contracts with the City of Huntsville. As a condition for the award of a contract and as a term and condition of the contract with the City of Huntsville, in accordance with § 31-13-9 (a) of the Alabama Immigration Act, as amended, any business entity or employer that employs one or more employees shall not knowingly employ, hire for employment, or continue to employ an unauthorized alien within the State of Alabama. During the performance of the contract, such business entity or employer shall participate in the E-Verify program and shall verify every employee that is required to be verified according to the applicable federal rules and regulations. The business entity or employer shall assure that these requirements are included in each subcontract in accordance with §31-13-9(c). Failure to comply with these requirements may result in breach of contract, termination of the contract or subcontract, and possibly suspension or revocation of business licenses and permits in accordance with §31-13-9 (e) (1) & (2).

Code of Alabama (1975) § 31-13-9 (k) requires that the following clause be included in all City of Huntsville contracts that have been competitively bid and is hereby made a part of this contract:

"By signing this contract the contracting parties affirm, for the duration of the agreement, that they will not violate federal immigration law or knowingly employ, hire for employment, or continue to employ an unauthorized alien within the State of Alabama. Furthermore, a contracting party found to be in violation of this provision shall be deemed in breach of the agreement and shall be responsible for all damages resulting therefrom."

Contractor's E-Verify Memorandum of Understanding shall be a part of the contract bid documents and shall be submitted with the bid package.

#### **49. CITY OF HUNTSVILLE'S TRAFFIC ENGINEERING DEPARTMENT CONSTRUCTION REQUIREMENTS**

For areas of this project that require removal of traffic loops, striping, markings, rpm's and ceramic markers, the following shall apply:

- 1. TRAFFIC SIGNAL LOOP REPAIRS** – All vehicular and bicycle detector loop replacements shall be in accordance with the Alabama Department of Transportation Standard Specifications for Highway Construction, Current Edition. Unless otherwise specified, traffic signal loops shall be replaced exactly as existed prior to any paving or resurfacing work. The general contractor will be responsible for documenting location of loops, location of any associated items for loop operation and assuring that loops are replaced exactly as existed prior to paving. All vehicular and bicycle loop repairs shall be replaced within fourteen (14) calendar days after paving work.
- 2. TRAFFIC SIGNAL STRIPING, MARKINGS, RAISED PAVEMENT MARKERS AND CERAMIC MARKERS FOR GUIDANCE** - All traffic striping, markings, raised pavement markers and ceramic markers for guidance shall be in accordance with the Alabama Department of Transportation Standard Specifications for Highway Construction, Current Edition. Unless otherwise specified, traffic striping, markings, raised pavement markers and ceramic markers for guidance shall be replaced exactly as traffic striping, markings, raised pavement markers and ceramic markers for guidance existed prior to any paving or resurfacing work. The general contractor will be responsible for documenting location of all striping, markings, raised pavement markers and ceramic markers for guidance and assuring that all are replaced exactly as existed prior to paving. All traffic striping, markings, raised pavement markers and ceramic markers for guidance shall be reflectorized. All resurfaced areas shall be marked with temporary striping and markings for traffic usage by nightfall each day, 7 days a week, in accordance with State of Alabama regulations. All permanent striping, markings, raised pavement markers and ceramic markers for guidance shall be replaced within thirty (30) calendar days after paving work.

## **50. SURVIVABILITY OF CONTRACT PROVISIONS**

Termination of this Contract by either party shall not affect the rights and obligations of the parties that accrued prior to the effective date of the termination. Terms and conditions of the contract that survive termination include, but are not necessarily limited to, provisions regarding payments, insurance, termination, warranty, governing law of the contract, liquidated damages, bonding requirements, notice procedures, waiver, and other requirements necessary and appropriate for the proper resolution of disputes, claims, and enforcement of the rights of the parties.

## **51. SURETY BONDS**

The Contractor shall furnish separate performance and payment bonds to the Owner within fifteen (15) days after the date of acceptance of this proposal by City Council action. Each bond shall set forth a penal sum in an amount not less than the Contract Price. Each bond furnished by the Contractor shall incorporate by reference the terms of this Contract as fully as though they were set forth verbatim in such bonds. In the event the Contract Price is adjusted by Change Order executed by the Contractor, the penal sum of both the performance bond and the payment bond shall be deemed increased by like amount. The performance and payment bonds furnished by the Contractor shall be in forms suitable to the Owner, in conformance with all the requirements of the Code of Alabama (1975), §39, and shall be executed by a surety, or sureties, reasonably suitable to the Owner. All bonds must be approved by the Mayor and the Clerk-Treasurer of the City of Huntsville.

## **52. GOVERNING LAW**

The Contract shall be governed by the laws of the State of Alabama.

## **53. ALABAMA IMMIGRATION ACT (Beason-Hammon Alabama Taxpayer and Citizen Protection Act, Act No. 2011-535, Code of Alabama (1975))**

Compliance with the requirements of the (Beason-Hammon Alabama Taxpayer and Citizen Protection Act, Act No. 2011-535, Code of Alabama (1975) § 31-13-1 through 31-13-30, as amended by Alabama Act 2012-241, commonly referred to as the Alabama Immigration Law, is required for City of Huntsville, Alabama contracts that are competitively bid as a condition of the contract performance. The Contractor shall submit in the bid package, with the requested information included on the form, the "City of Huntsville, Alabama Report of Ownership Form" listed in this document as Attachment "H". The bidder selected for award of the contract may be required to complete additional forms relating to citizenship or alien status of the bidder and its employees, including e-verify information, prior to award of a contract.

## **54. SUCCESSORS AND ASSIGNS**

The Owner and Contractor bind themselves, their successors and assigns to the other party hereto and to successors and assigns of such other party in respect to covenants, agreements, and obligations contained in this Contract. The Contractor shall not assign this Contract without written consent of the Owner. In no event shall a contract be assigned to an unsuccessful bidder whose bid was rejected because he or she was not a responsible or responsive bidder.

## **55. WRITTEN NOTICE**

Written notice shall be deemed to have been duly served if delivered in person to the individual or a member of the firm or entity or to an officer of the corporation for which it was intended, or if delivered at or sent by registered or certified mail to the last business address known to the party giving notice.

## **56. RIGHTS AND REMEDIES**

Duties and obligations imposed by the Contract Documents and rights and remedies available there under shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

No action or failure to act by the Owner, Engineer, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

## **57. ENTIRE AGREEMENT**

This Contract represents the entire agreement between the Owner and the Contractor and supersedes all prior communications, negotiations, representations or agreements, either written or oral. This agreement may be amended only by written instrument signed by both Owner and Contractor.

## SECTION 01 09 00 – SPECIAL CONDITIONS

### PART 1 - OTHER CONTRACT PROVISIONS

#### 1.1 BUY AMERICA

##### A. References:

1. 23 USC 313
2. ISTEA Section 1041(a) and 1048(a)
3. 23 CFR 635.410

##### B. APPLICABILITY

Applicable to all Federal-aid construction projects.

##### C. BACKGROUND

“Buy American” requirements are found in 41 CFR 10a-10d, and apply to direct Federal procurement activities. A direct Federal procurement occurs when a Federal government agency makes the purchase or awards a contract. Construction contracts done under Federal Lands Highways program are examples of direct procurements.

The STAA of 1978 (Pub. L. 95-599) §401 expanded domestic procurement coverage to the Federal-aid highway program by establishing “Buy America” requirements. Current Buy America policy is based on §165 of the STAA of 1982 (Pub. L. 97-424), as amended by ISTEA, and codified by SAFETEA-LU, §1903 as 23 USC 313. The requirements apply to all Federal-aid construction projects.

##### D. GUIDANCE

The current regulations require the use of domestic steel and iron in Federally funded construction projects. All manufacturing processes must take place domestically.

Buy America does not apply to raw materials (iron ore and alloys), scrap, pig iron, or processed, pelletized, and reduced iron ore.

If domestically produced steel billets or iron ingots are shipped overseas for any manufacturing process, and then returned to the United States, the resulting product does not conform with the Buy America requirements.

The manufacturing process for a steel/iron product is considered complete when the product is ready for use as an item (e.g. fencing, posts, girders, pipe, manhole cover, etc.) or could be incorporated as a component of a more complex product through a further manufacturing process.

For the Buy America requirements to apply, the steel or iron product must be permanently incorporated into the project. Buy America does not apply to temporary steel items such as temporary sheet piling, temporary bridges, steel scaffolding or falsework. Further, Buy America does not apply to materials which remain in place at the contractor’s convenience.

The practice of making otherwise eligible items nonparticipating for the purpose of circumventing the Buy America requirements is unacceptable and should not be approved in Federal-aid projects.

#### **E. WAIVERS**

With prior concurrence from Headquarters, the FHWA Division Administrator may grant a waiver of the Buy America requirements for specific projects if it can be shown that:

1. Following the requirements is inconsistent with the public interest, or
2. Insufficient quantities of satisfactory quality domestic products are available.

Only under very limited circumstances will materials delivery delay be considered as grounds for a waiver. The cost differential between domestic and foreign products is generally not grounds for a waiver. Approval authority for waivers of Buy America requirements cannot be delegated to the STA for any FHWA-funded contract.

When domestic steel products are available, meeting the contractor's schedule should not be the basis for requesting a Buy America waiver. The contractor, and the Engineer, should be aware of the Buy America requirements and consider these issues when considering this contract. Contractors must be aware of the Buy America contract provisions and consider them when developing anticipated schedules and bids for the construction project.

#### **F. ALTERNATIVE BIDDING PROCEDURES**

An alternative bidding procedure may be used to justify the use of foreign steel or iron. Under this procedure, the total project is bid using two alternatives: one which is based on foreign source products, and the second using domestic products. The use of foreign products may be justified if the lowest total bid based on domestic steel or iron products is 25 percent more than the lowest bid using corresponding foreign steel or iron products. The 25 percent differential applies to the total bid for the entire project, not just the bid prices for the steel or iron products.

#### **G. STATE OF ALABAMA REGULATIONS**

1. Contracts for public works project financed entirely by state or subdivisions thereof to provide for use of domestic products, if available (Section 39-3-1).
  - a. The awarding authority contracting for a public works project to be financed entirely by the State of Alabama or any political subdivision of the state, shall stipulate or cause to be stipulated in the contract a provision whereby the person, firm or corporation undertaking the project agrees to use in the execution of the contract materials, supplies, and products manufactured, mined, processed, or otherwise produced in the United States or its territories, if the same are available at reasonable and competitive prices and are not contrary to any sole source specification implemented under subsection (f) of Section 39-2-2.
  - b. In the event the contractor breaches the agreement to use domestic products, and domestic products are not used, there shall be a downward adjustment in the contract price equal to any realized savings or benefits to the contractor.

2. Contractors for public works project financed entirely by state or subdivisions thereof to use steel produced in the United States (Section 39-3-4).
    - a. Any contractor for a public works project, financed entirely by the State of Alabama or any political subdivision thereof, within this state shall use steel produced within the United States when specifications in the construction contract require the use of steel and do not limit its supply to a sole source under subsection (f) of Section 39-2-2. If the awarding authority decides that the procurement of the above mentioned domestic steel products becomes impractical as a result of a national emergency, national strike, or other cause, the awarding authority shall waive the above restriction.
    - b. In the event the contractor violates the domestic steel requirements of subsection (a), and domestic steel is not used, there shall be a downward adjustment in the contract price equal to any realized savings or benefits to the contractor.
  3. Preference to resident contractors in letting of certain public contracts (Section 39-3-5).
    - a. In the letting of public contracts in which any state, county, or municipal funds are utilized, except those contracts funded in whole or in part with funds received from a federal agency, preference shall be given to resident contractors, and a nonresident bidder domiciled in a state having laws granting preference to local contractors shall be awarded Alabama public contracts only on the same basis as the nonresident bidder's state awards contracts to Alabama contractors bidding under similar circumstances; and resident contractors in Alabama, as defined in Section 39-2-12, be they corporate, individuals, or partnerships, are to be granted preference over nonresidents in awarding of contracts in the same manner and to the same extent as provided by the laws of the state of domicile of the nonresident.
    - b. A summary of this law shall be made a part of the advertised specifications of all projects affected by this law.
- H. ALABAMA DEPARTMENT OF TRANSPORTATION BUY AMERICA CERTIFICATE OF COMPLIANCE
1. Included in this Section is a Buy America Certificate of Compliance for the Utility to include with their final invoice to the State of Alabama Department of Transportation.

Original 8/30/2013

**ALABAMA  
DEPARTMENT OF TRANSPORTATION  
BUY AMERICA  
CERTIFICATE OF COMPLIANCE**

Date \_\_\_\_\_, 20\_\_

Project No. \_\_\_\_\_

County Madison

\_\_\_\_\_  
(UTILITY OWNER)

Address: \_\_\_\_\_

Hereby certifies compliance with the "Buy America" requirements of the Federal regulations 23 U.S.C. 313 and 23 CFR 635.410 of this project.

Certified material test reports are on file for a period up to 2 years from the completion of the project showing the country of origin and/or processing of the manufacture, rolling, and coating.

These files will be available for inspection and verification by the Department and/or FHWA.

We further certify that the total value of foreign steel as described in the Buy America requirements for this project does not exceed one-tenth of one percent (0.1%) of the total contract price or \$2,500.00, whichever is greater.

Signed by \_\_\_\_\_ Title \_\_\_\_\_  
(Officer of Organization)

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
Notary Public

My Commission Expires: \_\_\_\_\_

## SECTION 01 11 00 - SUMMARY OF WORK

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes the following:

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

- B. Related Sections include the following:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

#### 1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: County Line Road & I-565 Sanitary Sewer Relocation Project No. 65-12-SM01. See Sheet 1 of the Drawings for Project Location.

- B. Owner: City of Huntsville  
Water Pollution Control Department  
1800 Vermont Rd.  
Huntsville, AL 35802

- C. Engineer: Garver, LLC  
5125A Research Drive  
Huntsville, AL 35805

- D. The Work consists of the following:

1. The County Line Road Sanitary Sewer Relocation work includes:
  - a. The sanitary sewer consists of installing approximately 7,071 LF of Owner-furnished Class 350, 16" ductile iron pipe (DIP) and all required manholes and appurtenances as shown on the Drawings and in the Contract Specifications.
  - b. Connections to existing sanitary sewer manholes and one open cut creek crossing.

- c. The forcemain installation consists of approximately 1,873 LF of Owner-furnished Class 250, 18" ductile iron pipe (DIP) and all required valves and appurtenances as shown on the Drawings and in the Contract Specifications.
- d. 30" Steel Encasement Jack and Bore Installation across County Line Road.
- e. Connections to existing forcemain.

#### 1.4 TYPE OF CONTRACT

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

#### 1.5 OWNER-FURNISHED PRODUCTS

- A. Owner will furnish products indicated. The Work includes providing support systems to receive Owner's equipment.

1. Owner will arrange and pay for delivery of Owner-furnished items according to Contractor's Construction Schedule. The Contractor is responsible for off-loading Owner-furnished products and coordinating with the manufacturer for scheduling delivery.
2. After delivery, the Owner's Representative will inspect delivered items for damage. Contractor shall be present for and assist in Owner's inspection.
3. If Owner-furnished items are damaged, defective, or missing, Owner will arrange for replacement.
4. Owner will furnish Contractor the earliest possible delivery date for Owner-furnished products. Using Owner-furnished earliest possible delivery dates, Contractor shall designate delivery dates of Owner-furnished items in Contractor's Construction Schedule.
5. Contractor shall review Shop Drawings, Product Data, and Samples and return them to Engineer noting discrepancies or anticipated problems in use of product.
6. Contractor is responsible for receiving, unloading, and handling Owner-furnished items at Project site.
7. Contractor is responsible for protecting Owner-furnished items from damage during storage and handling, including damage from exposure to the elements.
8. If Owner-furnished items are damaged as a result of Contractor's operations, Contractor shall repair or replace them.
9. Contractor shall install and otherwise incorporate Owner-furnished items into the Work.

#### B. Owner-Furnished Products:

1. Sanitary Sewer Piping and Push-On Joint: 16" Ductile Iron pipe, Class 350 with ceramic epoxy liner (Protecto-401 or approved equal) and Push-On Joint rubber gasket for pipe connections.
2. Forcemain Piping and Push-On Joint: 18" Ductile Iron pipe, Class 250 with ceramic epoxy liner (Protecto-401 or approved equal) and Push-On Joint rubber gasket for pipe connections. NOTE: Restrained Joint appurtenances shall be furnished by the contractor.

## 1.6 USE OF PREMISES

- A. **General:** The Contractor shall have full use of premises for construction operations, including use of Project site, during construction period. Contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. **General:** Contractor shall store all construction material and perform all related construction within the pump station site location as shown on the Drawings. Any additional easement required is the responsibility of the Contractor at no additional cost to the Owner.
- C. **Use of Site:** Limit use of premises to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
  - 1. **Limits:** Confine constructions operations to public rights-of-way and City of Huntsville property as shown on the Drawings.
  - 2. **Driveways and Entrances:** Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
    - a. Schedule deliveries to minimize use of driveways and entrances.
    - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

## 1.7 WORK RESTRICTIONS

- A. **On-Site Work Hours:** Work shall be generally performed during normal business working hours of 7:00 a.m. to 5:00 p.m. in accordance with the City of Huntsville's Noise Ordinance, Monday through Friday, except otherwise indicated.
  - 1. **Weekends and Holidays:** Contractor shall receive prior approval for this work.
  - 2. **Early Morning Hours:** Contractor shall receive prior approval for this work.
  - 3. **Hours for Utility Shutdowns:** Contractor shall receive prior approval for this work.
- B. **Existing Utility Interruptions:** Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
  - 1. Notify Owner not less than two (2) days in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without Owner's written permission.

## 1.8 SPECIFICATION FORMATS AND CONVENTIONS

- A. **Specification Format:** The Specifications are organized into Divisions and Sections using the 50-division format and CSI/CSC's "MasterFormat" numbering system.
  - 1. **Section Identification:** The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are

not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.

2. Division 01: Sections in Division 01 govern the execution of the Work of all Sections in the Specifications.

**B. Specification Content:** The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

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

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

**PART 3 - EXECUTION (Not Used)**

**END OF SECTION 01 11 00**

## **SECTION 01 11 11 - BASIS OF PAYMENT**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.**

#### **1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for unit prices.**
- B. Related Sections include the following:**
  - 1. Division 00 General Conditions - "City of Huntsville Supplement to General Requirements for Construction of Public Improvements" for Owner quantity and unit pricing requirements.**
  - 2. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.**
  - 3. Division 01 Section "Quality Requirements" for general testing and inspecting requirements.**

#### **1.3 DEFINITIONS**

- A. Unit price is stated on the Bid Quantities Form a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.**

#### **1.4 PROCEDURES**

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead and profit.**
- B. Measurement and Payment: Refer to Part 3 of this Section for establishment of unit prices. Methods of measurement and payment for unit prices are specified in Part 3.**
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.**

## PART 2 - PRODUCTS (Not Used)

## PART 3 - MEASUREMENT AND PAYMENT

### 3.1 GENERAL

- A. The Contractor shall receive and accept the compensation provided in the Proposal and the Contract as full payment for: furnishing all materials, labor, tools and equipment; performing all operations necessary to complete the work and equipment; performing all operations necessary to complete the work under the Contract; all loss or damages arising from the nature of the Work, or from any discrepancy between the actual quantities of work and quantities herein estimated by the Engineer, or from the action of the elements or from any unforeseen difficulties which may be encountered during the prosecution of the Work until the final acceptance by the Owner.
- B. The prices stated in the Proposal include all costs and expenses for taxes, labor, equipment, materials, commissions, transportation charges and expenses, patent fees and royalties, labor for handling materials during inspection, together with any and all other costs and expenses for performing and completing the Work as shown on the Drawings and specified herein. The basis of payment for an item at the unit price shown in the Proposal shall be in accordance with the description of that item in this Section.
- C. The Contractor's attention is again called to the fact that the quotations for the various items of work are intended to establish a total price for completing the Work in its entirety. Should the Contractor think that the cost for any item of work has not been established by the Bid Form or Payment Items, he shall include the cost for that work in some other applicable bid item, so that his proposal for the Project does reflect his total price for completing the Work in its entirety.

### 3.2 BASIS OF PAYMENT

#### A. General

- 1. The "Owner" shall refer to the City of Huntsville's Engineering Department and/or Water Pollution Control.
- 2. Contractor shall be responsible to repair any damage to those items not designated for demolition or removal in a manner satisfactory to the Owner at no additional cost to the Owner.
- 3. The Owner reserves the right to make reasonable changes in line locations without extra cost, except as may be determined by extra units of materials and construction actually involved.
- 4. At completion of project, deliver record documents and plan view drawing to Owner. Record Drawings must be submitted and approved prior to acceptance of the utility into the public system. **APPROVAL FOR FINAL PAYMENT WILL BE CONTINGENT UPON COMPLIANCE WITH THESE PROVISIONS.**

**B. Subsurface Investigation**

1. No separate pay item shall be included for subsurface investigation. Test borings and other exploratory operations conducted by the Contractor will be at no cost to the Owner.

**C. Excavation**

1. All excavation of materials shall be included in the unit bid price, unless otherwise specified on the Drawings or in the bid proposal.
2. All excavation will be unclassified and no additional payment will be made.
3. Unauthorized excavation, as well as remedial work directed by the Owner or the Owner's Representative, shall be at Contractor's expense.
4. No compensation will be allowed for additional excavation necessary for establishing stable subgrade; it shall be included in the unit bid price.
5. Dispose of excess soil material and waste materials in a legal manner per the Owner's direction at no additional cost to the Owner.
6. Pavement shall be sawcut without extra compensation to the Contractor.
7. Sheeting and shoring of trenches shall be provided at the Contractor's expense. In the event the Owner directs the Contractor to leave shoring materials in place, the Owner will reimburse the Contractor for the reasonable cost of leaving such materials in place.
8. Should the lack of a solid vertical excavation face occur due to improper trench excavation, the entire cost of furnishing and installing metal harness anchorages in excess of the Contract value of the contract blocking replaced by such anchorages shall be borne by the Contractor.

**D. Rock Removal**

1. All excavation of any nature shall be unclassified and payment for the same shall be included in the unit price of other items of work.

**E. Dewatering**

1. Dewatering of all excavations shall be the responsibility of the Contractor, and no additional compensation shall be allowed. The presence of groundwater and surface water should be accounted for in the base bid price.

**F. Pipe**

1. Measurement shall be on the basis of linear feet along the centerline of the pipe.
2. Payment shall be as specified in Section 3.4.
3. Work under these items includes, but is not limited to, trenching, bedding, backfilling, solid rock removal, hauling and disposal of bedding and waste material, cleanup, site restoration, and any work included in the Contract not covered by other items on the Bid Form.
4. Payment for fittings is not included in this pay item.

**G. Backfill and Fill**

1. Pipe bedding and trench stabilization are not considered separate pay items, regardless of amount or material required.
2. No additional compensation will be allowed for deep trenches unless otherwise specified.
3. The use of off-site borrow material for use as non-structural fill shall not result in additional compensation for the Contractor.
4. Earth, Class I, and Class II material used in final backfill is not a separate pay item.
5. The Contractor shall receive no extra payment for the filling in of settled or washed areas.
6. Excavated materials from trenches in excess of the quantity required for trench backfill, shall be disposed of by the Contractor at no additional cost to the Owner
7. When not shown as a bid item, controlled low-strength (CLSM) or flowable backfill will not be measured for separate payment but the cost thereof shall be included in the price bid for the appropriate item. Such price shall be full compensation for furnishing and installing flowable backfill and for all materials, labor, tools, equipment and incidentals necessary to complete the work.

**H. Testing**

1. Cost associated with testing pipe and manholes should be included in Contractor's base bid as shown Section 3.4 "Payment Items."
2. Should the sections under test fail to meet the requirements, the Contractor shall do all work of locating and repairing the leaks and re-testing as the Owner or Owner's Representative may require without additional compensation.
3. All pipe that does not pass the deflection test shall be replaced so that they do pass, at no cost to the Owner.
4. All testing requirements for the pump station shall be included for the pump station bid item included in the bid proposal.

**I. Maintaining Wastewater Flow**

1. No direct payment shall be made to the Contractor for this item. The Contractor shall include the cost of this work in other bid items, unless specified in the Contract Documents.
2. All repairs, replacements, and rebuilding caused by wastewater flow control operations shall be paid for by the Contractor.

**J. Line Markers**

1. All line markers required shall be included in the unit price of other items of work.

**3.3 MEASUREMENT**

- A.** The quantities for payment under this Contract shall be determined by actual measurement of the completed items, in place, ready for service and accepted by the Owner, in accordance with the applicable method of measurement therefore contained herein.

### 3.4 PAYMENT ITEMS

A. The following will clarify the work included for bid items in Attachment A (Bid Quantities) of the Contract Documents:

1. Mobilization, Demobilization, Bonds, Insurance, Including Clearing and Grubbing and Traffic Control (Not to exceed 5% of the Total Base Bid Price):
  - a. Measurement for required mobilization and demobilization will be based on the Contract unit price of one lump sum to compensate for the mobilization/demobilization as needed to meet the Contract requirements.
  - b. Payment for required mobilization will be based on the Contract unit price of one lump sum to compensate for the mobilization as needed to meet the Contract requirements.
  - c. Bonds & Insurance for this project.
  - d. Clearing & Grubbing: Clearing and grubbing will be made at a lump sum price to be included in this pay item for all required material and installation to meet the Contract requirements. Price and payment shall be full compensation for all required materials and labor to meet the Contract requirements.
  - e. Traffic Control: Traffic Control shall be included in the lump sum price for mobilization. This lump sum shall compensate all required traffic control throughout duration of project.
2. Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 0' to 6' deep, Complete-In-Place Per COH Specification #646, #647 and #648.
  - a. Measurement for all manholes will be made at the Contract unit price per each manhole for the size and depth installed.
  - b. Payment for each manhole shall include all necessary materials including frame, cover, rim, and all necessary appurtenances for a complete and working manhole.
3. Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 6' to 12' deep, Complete-In-Place Per COH Specification #646, #647 and #648.
  - a. Measurement for all manholes will be made at the Contract unit price per each manhole for the size and depth installed.
  - b. Payment for each manhole shall include all necessary materials including frame, cover, rim, and all necessary appurtenances for a complete and working manhole.
4. Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 12' to 18' deep, Complete-In-Place Per COH Specification #646, #647 and #648.
  - a. Measurement for all manholes will be made at the Contract unit price per each manhole for the size and depth installed.
  - b. Payment for each manhole shall include all necessary materials including frame, cover, rim, and all necessary appurtenances for a complete and working manhole.

5. Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 18' to 24' deep, Complete-In-Place Per COH Specification #646, #647 and #648.
  - a. Measurement for all manholes will be made at the Contract unit price per each manhole for the size and depth installed.
  - b. Payment for each manhole shall include all necessary materials including frame, cover, rim, and all necessary appurtenances for a complete and working manhole.
6. Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 24' to 30' deep, Complete-In-Place Per COH Specification #646, #647 and #648.
  - a. Measurement for all manholes will be made at the Contract unit price per each manhole for the size and depth installed.
  - b. Payment for each manhole shall include all necessary materials including frame, cover, rim, and all necessary appurtenances for a complete and working manhole.
7. Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 30' to 36' deep, Complete-In-Place Per COH Specification #646, #647 and #648.
  - a. Measurement for all manholes will be made at the Contract unit price per each manhole for the size and depth installed.
  - b. Payment for each manhole shall include all necessary materials including frame, cover, rim, and all necessary appurtenances for a complete and working manhole.
8. Watertight Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 6' to 12' deep, Complete-In-Place Per COH Specification #646, #647 and #648.
  - a. Measurement for all manholes will be made at the Contract unit price per each manhole for the size and depth installed.
  - b. Payment for each manhole shall include all necessary materials including frame, cover, watertight rim, and all necessary appurtenances for a complete and working manhole.
9. Watertight with Vent Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 6' to 12' deep, Complete-In-Place Per COH Specification #646, #647 and #648.
  - a. Measurement for all manholes will be made at the Contract unit price per each manhole for the size and depth installed.
  - b. Payment for each manhole shall include all necessary materials including frame, cover, watertight rim, manhole vent, and all necessary appurtenances for a complete and working manhole.
10. 16-Inch Class 350 DIP Gravity Sewer and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included (Depth of Cover 10 feet or less):
  - a. Measurement of pipe, except as otherwise specified will be based on the laying length of the actual piping in linear feet actually placed as measured along the

- centerline of the pipe, including the length of fittings and specials measured along their centerlines.
- b. Payment for pipe will be made at the Contract unit price per linear foot for the size and type installed, which price and payment shall be full compensation for all fittings, excavation, dewatering, pipe bedding, backfill and compaction, site restoration, polyethylene polywrap, metallic locate tape, and for all equipment and all other work necessary to complete the Contract requirements.
  - c. This payment item includes installation ONLY of Owner-furnished 16-inch DIP gravity sewer piping to complete the Contract requirements.
11. 16-Inch Class 350 DIP Gravity Sewer and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included (Depth of Cover 10 feet to 20 feet):
- a. Measurement of pipe, except as otherwise specified will be based on the laying length of the actual piping in linear feet actually placed as measured along the centerline of the pipe, including the length of fittings and specials measured along their centerlines.
  - b. Payment for pipe will be made at the Contract unit price per linear foot for the size and type installed, which price and payment shall be full compensation for all fittings, excavation, dewatering, pipe bedding, backfill and compaction, site restoration, polyethylene polywrap, metallic locate tape, and for all equipment and all other work necessary to complete the Contract requirements.
  - c. This payment item includes installation ONLY of Owner-furnished 16-inch DIP gravity sewer piping to complete the Contract requirements.
12. 16-Inch Class 350 DIP Gravity Sewer and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included (Depth of Cover 20 feet to 30 feet):
- a. Measurement of pipe, except as otherwise specified will be based on the laying length of the actual piping in linear feet actually placed as measured along the centerline of the pipe, including the length of fittings and specials measured along their centerlines.
  - b. Payment for pipe will be made at the Contract unit price per linear foot for the size and type installed, which price and payment shall be full compensation for all fittings, excavation, dewatering, pipe bedding, backfill and compaction, site restoration, polyethylene polywrap, metallic locate tape, and for all equipment and all other work necessary to complete the Contract requirements.
  - c. This payment item includes installation ONLY of Owner-furnished 16-inch DIP gravity sewer piping to complete the Contract requirements.
13. 16-Inch Class 350 DIP Gravity Sewer and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included (Depth of Cover 30 feet to 40 feet):
- a. Measurement of pipe, except as otherwise specified will be based on the laying length of the actual piping in linear feet actually placed as measured along the centerline of the pipe, including the length of fittings and specials measured along their centerlines.

- b. Payment for pipe will be made at the Contract unit price per linear foot for the size and type installed, which price and payment shall be full compensation for all fittings, excavation, dewatering, pipe bedding, backfill and compaction, site restoration, polyethylene polywrap, metallic locate tape, and for all equipment and all other work necessary to complete the Contract requirements.
  - c. This payment item includes installation ONLY of Owner-furnished 16-inch DIP gravity sewer piping to complete the Contract requirements.
- 14. **Inside Drop Manhole Connection to Existing Sanitary Sewer Manhole:**
  - a. Measurement for inside drop manhole connection to existing sanitary sewer manhole will be made at the Contract unit price per each inside drop manhole connection to provide full compensation as needed to meet the Contract requirements.
  - b. Payment for inside drop manhole connection to existing sanitary sewer manhole will be made at the Contract unit price per each inside drop connection to provide full compensation for the new connection as needed to meet the Contract requirements, which price and payment shall be full compensation for all material and equipment required.
- 15. **Connection to Existing Sanitary Sewer Manhole:**
  - a. Measurement for the connection to an existing sanitary sewer manhole will be made at the Contract unit price per each manhole connection to provide full compensation as needed to meet the Contract requirements.
  - b. Payment for the connection to existing sanitary sewer manhole will be made at the Contract unit price per each connection to provide full compensation for the new connection as needed to meet the Contract requirements, which price and payment shall be full compensation for all material and equipment required.
- 16. **18-Inch Class 250 DIP Forcemain and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included:**
  - a. Measurement of pipe, except as otherwise specified will be based on the laying length of the actual piping in linear feet actually placed as measured along the centerline of the pipe, including the length of fittings and specials measured along their centerlines.
  - b. Payment for pipe will be made at the Contract unit price per linear foot for the size and type installed, which price and payment shall be full compensation for all mechanical joint fittings, restrained joint fittings, excavation, dewatering, pipe bedding, backfill and compaction, site restoration, polyethylene polywrap, metallic locate tape, removal and replacement of existing fencing, and for all equipment and all other work necessary to complete the Contract requirements.
  - c. This payment item includes installation ONLY of Owner-furnished 18-inch DIP forcemain piping to complete the Contract requirements.
- 17. **18-Inch Gate Valve and Required Appurtenances**
  - a. Measurement and payment for gate valves will be made at the Contract unit price of each gate valve, valve box and all other required appurtenances

- installed for all required material and installation to meet the Contract requirements.
- b. Payment for gate valves, except as otherwise specified, will be based on number of installed gate valves, valve boxes and all other required appurtenances. The contractor is responsible for installation of all necessary materials and required appurtenances and Price and payment shall be full compensation for all required materials and labor to complete the installation to meet the Contract requirements.
18. 18-Inch DIP-RJ 11¼ Degree Bend, Thrust Block and Required Appurtenances:
- a. Measurement for all 11¼ degree bends will be made at the Contract unit price per 11¼ degree bend for the size and type installed.
  - b. Payment for all 11¼ degree bends will be made at the Contract unit price per 11¼ degree bend for the size and type installed, which price and payment shall be full compensation for bend, restrained joint fittings, thrust block and all other required materials and labor to meet the Contract requirements.
19. 18-Inch DIP-RJ 45 Degree Bend, Thrust Block and Required Appurtenances:
- a. Measurement for all 45 degree bends will be made at the Contract unit price per 45 degree bend for the size and type installed.
  - b. Payment for all 45 degree bends will be made at the Contract unit price per 45 degree bend for the size and type installed, which price and payment shall be full compensation for bend, restrained joint fittings, thrust block and all other required materials and labor to meet the Contract requirements.
20. Connection to Existing 18-Inch DIP Forcemain:
- a. Measurement for the connection to an existing 18-Inch DIP forcemain will be made at the Contract unit price per each forcemain connection to provide full compensation as needed to meet the Contract requirements.
  - b. Payment for the connection to existing 18-Inch DIP forcemain will be made at the Contract unit price per each connection to provide full compensation for the new connection as needed to meet the Contract requirements, which price and payment shall be full compensation for all material, appurtenances and equipment required.
21. Site Restoration to include grading, topsoil, and preparation for seed on all disturbed areas.
- a. Measurement for site restoration will be made at the Contract unit price per acre for all required material and installation to meet the Contract requirements.
  - b. Payment for site restoration, except as otherwise specified, will be based on the unit price per acre required for site restoration. Price and payment shall be full compensation for all required materials and labor to meet the Contract requirements.

22. **Temporary and Permanent Grassing:**
- a. Measurement for temporary and permanent grassing shall be made at the Contract unit price per acre for all required seed, fertilizer, mulch and any other material or labor necessary to meet the Contract requirements.
  - b. Payment for temporary and permanent grassing, except as otherwise specified, will be based on the unit price per acre required for seed, fertilizer and mulch and any other material or labor necessary to meet the Contract requirements. Price and payment shall be full compensation for all required materials and labor to meet the Contract requirements.
23. **Class II Rip-Rap Replacement:**
- a. Measurement for rip-rap replacement shall be made at the Contract unit price per lump sum for all required material and installation to meet the Contract requirements.
  - b. Payment for rip-rap replacement, except as otherwise specified, will be based on the lump sum price required for all required materials and labor to meet the Contract requirements.
24. **Silt Fencing:**
- a. Measurement for silt fencing will be made at the Contract unit price per linear foot for all required material and installation to meet the Contract requirements.
  - b. Payment for silt fencing, except as otherwise specified, will be based on the unit price per linear foot required for silt fencing. Price and payment shall be full compensation for all required materials and labor to meet the Contract requirements.
25. **Additional Erosion Control per Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas, March 2009:**
- a. Measurement for additional erosion control will be made at the Contract Lump Sum price for all required additional erosion control materials and labor to meet the Contract requirements.
  - b. Payment for erosion control, except as otherwise specified, will be made at the Contract Lump Sum price required for additional erosion control. Price and payment shall be full compensation for all required materials and labor to meet the Contract requirements.
  - c. This pay item includes all additional erosion control measures necessary (other than silt fencing) to complete the requirements of the Work for this contract.
26. **Open Cut Creek Crossing (Including Concrete Encasement):**
- a. Measurement for open cut creek crossing will be made at the Contract unit price per linear foot of creek open cut, which price and payment shall be full compensation for all material, equipment and labor required to meet the Contract requirements.

- b. Payment for open cut creek crossing will be made at the Contract unit price per linear foot of creek open cut, which price and payment shall be full compensation for all material, equipment and labor required to meet the Contract requirements.
- 27. 30-Inch Steel Encasement Jack and Bore Installation (w/ 90 LF 18-Inch CL 250 DIP-RJ):
  - a. Measurement for steel encasement installation will be based on the laying length of encasement in linear feet actually placed as measured along the centerline of the completed encasement.
  - b. Payment for steel encasement installation will be based on the laying length of encasement in linear feet actually placed as measured along the centerline of the completed encasement, which price and payment shall be full compensation for all casing spacers, loading of carrier pipe in steel encasement and for all equipment and all other work necessary to complete the Contract requirements.
- 28. Remove and Replace Existing Gravel Drive
  - a. Measurement for removing and replacing existing gravel drive will be made at the Contract unit price per ton of gravel drive removed and replaced, which price and payment shall be full compensation for all material, equipment and labor required to meet the Contract requirements.
  - b. Payment for removing and replacing existing gravel drive will be made at the Contract unit price per ton of gravel drive removed and replaced, which price and payment shall be full compensation for all material, equipment and labor required to meet the Contract requirements.
  - c. Measurement and payment for removing and replacing existing gravel drive is based on replacing existing gravel drive with a four (4) inch thick gravel drive. Removal and replacement of existing gravel drive shall be made in like kind.
- 29. Vacuum Testing For Manhole (Material and Installation):
  - a. Measurement for testing manholes, except as otherwise specified will be based on the contract unit price for each manhole tested as required in the contract documents.
  - b. Payment for testing manholes, except as otherwise specified will be based on the contract unit price for each manhole tested as required in the contract documents.
- 30. Abandon Sanitary Sewer Line at County Line Road Pump Station:
  - a. Measurement for sanitary sewer line abandonment, except as otherwise specified will be based on the contract unit price per linear foot of sanitary sewer line abandoned as required in the contract documents.
  - b. Payment for sanitary sewer line abandonment, except as otherwise specified will be based on the contract unit price per linear foot of sanitary sewer line abandoned as required in the contract documents.

31. **Sewer Line Testing (Material and Installation):**
  - a. Measurement for testing sewer lines, except as otherwise specified will be based on the length of the pipe tested in accordance with the contract documents.
  - b. Payment for testing sewer lines, except as otherwise specified will be based on the length of the pipe tested in accordance with the contract documents.
32. **Forcemain Testing (Material and Installation):**
  - a. Measurement for testing forcemain, except as otherwise specified will be based on the length of the pipe tested in accordance with the contract documents.
  - b. Payment for testing forcemain, except as otherwise specified will be based on the length of the pipe tested in accordance with the contract documents.
33. **Digital As-Built Drawings:**
  - a. Measurement and payment for all required As-Built Drawings will be based on a lump sum to provide full compensation for all required Digital As-Built Drawings documenting the construction of the Work outlined in this Contract.
  - b. Payment for Digital As-Built Drawings will be based on the Contract lump sum price for all required As-Built Drawings documenting the construction of the Work outlined in this Contract.
34. **Aid-To-Construction: Utility Relocation**
  - a. Measurement and payment for Aid-to-Construction shall be based on one lump sum fee to provide full compensation for reimbursement of utility relocation as the result of construction activities as needed to meet the Contract requirements.
  - b. This lump sum amount shall be reimbursement for utility relocation located inside the defined easement as identified on the Plans. Reimbursement based on a fixed in kind lump sum based on written documentation provided by utilities not to exceed \$50,000.00.
35. **Reimbursement for Crop Damage:**
  - a. Measurement and payment for reimbursement of crop damage shall be based on one lump sum to provide full compensation for reimbursement of crops damaged as the result of construction activities as needed to meet the Contract requirements.
  - b. This lump sum amount shall be reimbursement for crop damage located inside the defined easement as identified on the Plans. Reimbursement based on a fixed in kind lump sum based on written documentation provided by land owner not to exceed \$10,000.00.

## **PART 4 - EXECUTION**

### **4.1 PAY ITEMS**

- A. The pay items listed hereinbefore refer to the items listed in the Bid Schedule and cover all the pay items under the base bid for the contract.**
- B. Any and all other items of work listed in the specifications or shown on the Contract Drawings for the contract shall be considered incidental to and included in those pay items.**

### **4.2 QUANTITIES OF ESTIMATE**

- A. Wherever the estimated quantities of work to be done and materials to be furnished under this contract are shown in any of the documents, including the Bid Proposal, they are given for use in comparing bids and the right is especially reserved except as herein otherwise specifically limited, 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 or liability for damages. The Owner will not be financially responsible for any omissions from the Contract Documents and therefore not included by the Contractor in his proposal.**
- B. The mapping utilized for the Drawings in the Contract Documents are indicated at an approximate scale and shall not be scaled for quantity take-offs. The pipeline quantities listed in the bid schedule are given for use in comparing bids and may not be the actual quantities to be installed. It is the Contractor's responsibility to field verify the length and quantities of pipeline to be installed prior to the ordering of materials. Payment on unit price contracts are based on actual quantities installed. The Owner will not be financially responsible for any shortage of pipe or overrun of pipe ordered for the pipeline quantities.**
- C. The actual quantities of all materials to be used for this project shall be field verified prior to the Contractor ordering the necessary materials. The quantity listed in the bid schedule is given for use in comparing bids and may increase or diminish as may be deemed necessary or as directed by the Owner. Any such increase or diminution shall not give cause for claims or liability for damages. The Owner will not be financially responsible for any charges incurred for restocking of materials ordered.**

**END OF SECTION 01 11 00**

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## SECTION 01 12 00 - PROJECT MEETINGS

### PART 1 - GENERAL

#### 1.1 GENERAL

- A. Engineer will schedule physical arrangements for meetings throughout progress of Work, prepare meeting agenda with regular participant input and distribute with written notice of each meeting, preside at meetings, record minutes to include significant proceedings and decisions, and reproduce and distribute copies of minutes within 5 days after each meeting to participants and parties affected by meeting decisions.

#### 1.2 PRECONSTRUCTION CONFERENCE

- A. Contractor shall be prepared to discuss the following subjects, as a minimum:

1. Required schedules.
2. List of Major Subcontractors.
3. Relation and coordination of prime contractors.
4. Status of Bonds and insurance.
5. Sequencing of critical path work items.
6. Designation of responsible personnel.
7. Progress payment procedures.
8. Processing of field decisions
9. Project changes and clarification procedures.
10. Adequacy of distribution of Contract Documents
11. Submittal of Shop Drawings, Project Data, and Samples.
12. Maintaining Record Drawings
13. Use of site, access, office and storage areas, security and temporary facilities.
14. Major product delivery and priorities.
15. Contractor's safety plan and representative.
16. Security procedures
17. Housekeeping procedures

- B. Attendees will include:

1. Owner's representatives.
2. Contractor's office representative.
3. Contractor's resident superintendent.
4. Contractor's quality control representative.
5. Subcontractors representatives whom Contractor may desire or Engineer may request to attend.
6. Engineer's representatives.
7. Representatives of governmental or other regulatory agencies.
8. Others as appropriate.

#### 1.3 PRELIMINARY SCHEDULES REVIEW MEETING

- A. As set forth in General Conditions and Section 01 32 00, CONSTRUCTION PROGRESS DOCUMENTATION.

#### 1.4 PROGRESS MEETINGS

- A. Engineer will schedule regular progress meetings at site or designated location, conducted on a weekly or as set by Owner/Engineer. At one meeting each month the Contractor's updated narrative progress report and overall schedule will be a topic of discussion.
- B. Attendees will include:
  - 1. Owner's representative(s), as appropriate.
  - 2. Contractor, Subcontractors, and Suppliers, as appropriate.
  - 3. Engineer's representative(s).
  - 4. Others as appropriate.
- C. Minimum agenda:
  - 1. Review work progress since last meeting.
  - 2. Note field observations, problems, and decisions.
  - 3. Identify problems which impede planned progress.
  - 4. Revise construction schedule as indicated.
  - 5. Plan progress during next work period.
  - 6. Coordinate projected progress with other prime contractors.
  - 7. Review submittal schedules, expedite as required to maintain schedule.
  - 8. Maintaining of quality and work standards.
  - 9. Review any changes proposed by Owner for effect on construction schedule and/or completion date.
  - 10. Application for Payment
  - 11. Complete other current business needing discussion and resolution.

#### 1.5 QUALITY CONTROL AND COORDINATION MEETINGS

- A. Scheduled by Engineer on regular basis and as necessary to review test and inspection reports, and other matters relating to quality control of Work and work of other contractors.
- B. Attendees will include:
  - 1. Contractor.
  - 2. Contractor's designated quality control representative.
  - 3. Subcontractors and Suppliers, as necessary.
  - 4. Engineer's representatives.

#### 1.6 PREINSTALLATION MEETINGS

- A. When required in individual Specification sections, convene at site prior to commencing Work of that section.
- B. Require attendance of entities directly affecting, or affected by, Work of that section.
- C. Notify Engineer 4 days in advance of meeting date.
- D. Provide suggested agenda to Engineer to include reviewing conditions of installation, preparation and installation or application procedures, and coordination with related Work and work of others.

**1.7 FACILITY STARTUP MEETINGS**

- A. Schedule and attend a minimum of 5 facility startup meetings. The first of such meetings shall be held prior to submitting the Facility Startup Plan, and shall include preliminary discussions regarding such plan.**
- B. Agenda items shall include, but not be limited to, content of Facility Startup Plan, coordination needed between various parties in attendance, and potential problems associated with startup.**
- C. Attendees will include:**
  - 1. Contractor.**
  - 2. Contractor's designated quality control representative.**
  - 3. Subcontractors and equipment Manufacturer's representatives whom Contractor deems to be directly involved in facility startup.**
  - 4. Engineer's representatives.**
  - 5. Owner's operations personnel.**
  - 6. Others as required by Contract Documents or as deemed necessary by Contractor.**

**1.8 OTHER MEETINGS**

- A. In accordance with Contract Documents and as may be required by Owner and Engineer.**

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION 01 12 00**

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## SECTION 01 26 00 – CONTRACT MODIFICATION PROCEDURES

### PART 1 - GENERAL

#### 1.1 SPECIFICATIONS

- A. Division 00 – GENERAL CONDITIONS – CITY OF HUNTSVILLE SUPPLEMENT TO GENERAL REQUIREMENTS FOR CONSTRUCTION OF PUBLIC IMPROVEMENTS.
- B. In the event of a discrepancy between these contract specifications and the COH standard documents, the COH Standard Documents shall prevail.

#### 1.2 PROPOSAL REQUEST

- A. Owner may, in anticipation of ordering an addition, deletion, or revision to the Work, request Contractor to prepare a detailed proposal of cost and times to perform contemplated change.
- B. Proposal request will include reference number for tracking purposes and detailed description of and reason for proposed change, and such additional information as appropriate and as may be required for Contractor to accurately estimate cost and time impact on Project.
- C. Proposal request is for information only; Contractor is neither authorized to execute proposed change nor to stop Work in progress as result of such request.
- D. Contractor's written proposal shall be transmitted to Engineer promptly, but not later than 14 days after Contractor's receipt of Owner's written request. Proposal shall remain firm for a maximum period of 45 days after receipt by Engineer.
- E. Owner's request for proposal or Contractor's failure to submit such proposal within the required time period will not justify a claim for an adjustment in Contract Price or Contract Times (or Milestones).

#### 1.3 CLAIMS

- A. Include, at a minimum:
  - 1. Specific references including:
    - a. Drawing numbers
    - b. Specification section and article/paragraph number
    - c. Submittal type, Submittal number, date reviewed, Engineer's comment, as applicable, with appropriate attachments.
  - 2. Stipulated facts and pertinent documents, including photographs and statements.
  - 3. Interpretations relied upon.
  - 4. Description of:
    - a. Nature and extent of claim
    - b. Who or what caused the situation
    - c. Impact to the Work and work of others
    - d. Discussion of claimant's justification for requesting a change to price or times or both.
  - 5. Estimated adjustment in price claimant believes it is entitled to with documentation and justification.

6. Requested Change in Contract Times: Include at least;
  - a. Progress schedule documentation showing logic diagram for request.
  - b. Documentation that float times available for Work have been used
  - c. Revised activity logic with durations including sub-network logic revisions, duration changes, and other interrelated schedule impacts, as appropriate.
7. Documentation as may be necessary as set forth below for Work Change Directive, and as Engineer may otherwise require.

#### 1.4 WORK CHANGE DIRECTIVES

##### A. Procedures:

1. Engineer will:
    - a. Initiate, including a description of the Work involved and any attachments.
    - b. Affix signature, demonstrating Engineer's recommendation.
    - c. Transmit five copies to Owner for authorization.
  2. Owner will:
    - a. Affix signature, demonstrating approval of the changes involved.
    - b. Return four copies to Engineer, who will retain one copy, send one copy to the Resident Project Representative or other field representative, and forward two copies to Contractor.
  3. Upon completion of Work covered by the Work Change Directive or when final Contract Times and Contract Price is determined, Contractor shall submit documentation for inclusion in a Change Order.
  4. Contractor's documentation shall include but not be limited to:
    - a. Appropriately detailed records of Work performed to enable determination of value of the Work.
    - b. Full information required to substantiate resulting change in Contract Times and Contract Price for Work. On request of Engineer, provide additional data necessary to support documentation.
    - c. Support data for Work performed on a unit price or Cost of the Work basis with additional information such as:
      - 1). Dates Work was performed, and by whom.
      - 2). Time records, wage rates paid, and equipment rental rates.
      - 3). Invoices and receipts for materials, equipment, and subcontracts, all similarly documented.
- B. Effective Date of Work Change Directive: Date of signature by Owner, unless otherwise indicated thereon.

#### 1.5 CHANGE ORDERS OR WRITTEN AMENDMENTS

##### A. Procedure:

1. Engineer will prepare six copies of proposed Change Order or Written Amendment and transmit such with Engineer's written recommendation (Change Order only) and request to Contractor for signature.
2. Contractor shall, upon receipt, either:
  - a. Promptly sign copies, retaining one for its file, and return remaining five copies to Engineer for Owner's signature, or
  - b. Return unsigned five copies with written justification for not executing Change Order or Written Amendment.

3. Engineer will, upon receipt of Contractor signed copies, promptly forward Engineer's written recommendation and partially executed five copies for Owner's signature, or if Contractor fails to execute the Change Order or Written Amendment, Engineer will promptly so notify Owner and transmit Contractor's justification to Owner.
  4. Upon receipt of Contractor-executed Change Order or Written Amendment, Owner will promptly either:
    - a. Execute Change Order or Written Amendment, retaining one copy for its file and returning four copies to Engineer, or
    - b. Return to Engineer unsigned copies with written justification for not executing Change Order or Written Amendment.
  5. Upon receipt of Owner-executed Change Order or Written Amendment, Engineer will transmit two copies to Contractor, one copy to Resident Project Representative or other field representative, and retain one copy, or if Owner fails to execute the Change Order or Written Amendment, Engineer will promptly so notify Contractor and transmit Owner's justification to Contractor.
  6. Upon receipt of Owner-executed Change Order, Contractor shall:
    - a. Perform Work covered by Change Order or Written Amendment.
    - b. Revise Schedule of Values to adjust Contract Price and submit with next Application for Payment.
    - c. Revise progress schedule to reflect changes in Contract Times, if any, and to adjust times for other items of Work affected by change.
    - d. Enter changes in Project record documents after completion of change related Work.
- B. In signing a Change Order or Written Amendment, Owner and Contractor acknowledge and agree that:
1. Stipulated compensation (Contract Price or Contract Times, or both) set forth includes payment for:
    - a. The Cost of the Work covered by the Change Order or Written Amendment
    - b. Contractor's fee for overhead and profit
    - c. Interruption of progress schedule
    - d. Delay and impact, including cumulative impact, on other Work under the Contract Documents, and
    - e. Extended overheads.
  2. Change Order or Written Amendment constitutes full mutual accord and satisfaction for the change to the Work.
  3. Unless otherwise stated in the Change Order or Written Amendment, all requirements of the original Contract Documents apply to the Work covered by the Change Order or Written Amendment.

#### 1.6 FIELD ORDER PROCEDURES

- A. Engineer will issue Field Orders, with 3 copies to Contractor.
- B. Effective date of the Field Order shall be the date of signature by Engineer, unless otherwise indicated thereon.
- C. Contractor shall acknowledge receipt by signing and returning one copy to Engineer.
- D. Field Orders will be incorporated into a Change Order, as a no-cost change to the Contract.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION**

## SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION

### PART 1 - GENERAL

#### 1.1 SUBMITTALS

##### A. Informational:

1. Statement of Qualification (SOQ) for land surveyor or civil engineer.
2. Photographs and other records of examination.
3. Video Recordings: Submit one copy, including updated copy of project video log, within 5 days of being taken.

#### 1.2 UTILITY NOTIFICATION AND COORDINATION

##### A. Coordinate all Work with various utilities within Project limits, before excavation begins. Notify applicable utilities prior to commencing Work, if damage occurs, or if conflicts or emergencies arise during Work.

##### 1. Electric Department; Gas Department:

Athens Utilities  
508 South Jefferson Street  
Athens, Alabama 35611

##### 2. Water and Sanitary Sewer Department:

Limestone County Water and Sewer Authority  
17218 US Highway 72  
Athens, Alabama 35611

##### 3. Billboard Advertising

##### 4. Cell Tower

Tower Site AL02612  
SBA – Owner of Tower ( [www.SBA-site.com](http://www.SBA-site.com) ).

##### B. Before excavation, arrange for field location of known utilities utilizing Alabama One Call, or similar agency. Contact information for Alabama One Call: Dial 811 or go to [www.al1call.com](http://www.al1call.com). Please refer to general notes on the Plans regarding utilities.

#### 1.3 WORK SEQUENCING/CONSTRAINTS

##### A. Include the following work sequences in the Progress Schedule required under Section 01 32 00, CONSTRUCTION PROGRESS DOCUMENTATION.

##### B. This Section identifies several construction constraints that must be reflected in the Contractor project coordination. An overall outline is presented in this Section for the Construction coordination, demolition, and seasonal/process constraints that shall be considered during construction. The sequence of Work for this Project must reflect the constraints identified herein.

**C. Definitions:**

1. Dry weather periods shall, in general, be from June 15 through October 1. Actual dry weather periods shall be as determined by the Owner based on weather, flows entering plant, and plant operation requirements.
2. Wet weather periods shall be any time period which is not within the defined dry weather periods.
3. Low flow period shall be from 2:00 a.m. to 6:00 a.m.
4. Minor Shutdown: Any shutdown requiring less than 8 hours.
5. Major Shutdown: Any shutdown other than a minor shutdown.

**D. Shutdown of Plant Operations:**

1. Provide 14 days advance notice to Engineer and Owner of need for a minor shutdown.
2. Provide 30 days advance notice to Engineer and Owner of need for a major shutdown.
3. Contractor shall schedule a shutdown coordination meeting with Owner and Engineer one week prior to each shutdown.
4. Do not proceed with work affecting a facility's operation without obtaining Owner and Engineer advance approval of the need for, and duration of, such work. The Owner will endeavor to grant Contractor requests where possible. However, because Owner's primary responsibility is to treat wastewater, the requested timing may not be possible.
5. Any and all plant shutdowns shall require a shutdown plan, including detailed schedule, backup tools and equipment, personnel involved, contingency plan, and any procedures involved in restarting the process or facility. Owner's approval of the Shutdown Plan is required prior to any shutdowns.
6. Shutdowns will be allowed, but shall only be allowed in dry weather periods and with at least one flow equalization basin in operation. Shutdowns may be limited to low flow periods.
7. No minor or major shutdowns allowed during wet weather periods or within 7 days of a rainfall event or previous shutdown.

**1.4 FACILITY OPERATIONS**

- A. Continuous operation of Owner's facilities is of critical importance. Schedule and conduct activities to enable existing facilities to operate continuously, unless otherwise specified, and to minimize the number of shutdowns of the plant, facilities, existing unit processes, pipelines, utility services, etc.
- B. Perform Work continuously during critical connections and changeovers, as required, to prevent interruption of Owner's operations.
- C. Conduct Work outside regular working hours on prior written consent of Owner to meet Project schedule and avoid undesirable conditions.
- D. Be responsible for planning, designing, and providing various temporary services, utilities, connections, temporary piping, bypass facilities and temporary connections, and similar items to maintain continuous operations of Owner's facility. Sequences other than those specified will be considered upon written request to Owner and Engineer, provided they afford equivalent continuity of operations.

- E. Do not close lines, open or close valves, or take other action which would affect the operation of existing systems, except as specifically required by the Contract Documents and after authorization by Owner and Engineer. Such authorization will be considered within 48 hours after receipt of Contractor's written request.
- F. Any tanks or pipelines requiring drainage prior to construction will be drained by the Owner's staff to the maximum extent possible utilizing existing piping and drains where they exist. Contractor shall provide temporary pumping and effort to complete drainage of tank or pipeline as required. Provide minimum 7 days notice to Engineer and Owner of need to drain a facility, unless otherwise specified.
- G. Power outages will be considered upon 48 hours written request to Owner and Engineer. Describe the reason, anticipated length of time, and areas affected by the outage in the written request. Providing temporary provisions for continuous power supply to critical existing facility components, is requested by Owner.
- H. Coordinate proposed work with Engineer and Owner before implementing unit shutdowns. Under no circumstances shall Work end if such actions may inadvertently cause a cessation of any facility operation. In such cases, remain onsite until necessary repairs are complete and facility is brought back online.
- I. Relocation of Existing Facilities:
  - 1. During construction, it is expected that minor relocations of Work will be necessary.
  - 2. Provide complete relocation of existing structures and Underground Facilities, including piping, utilities, equipment and structures, electrical conduit wiring, electrical duct bank, and other necessary items.
  - 3. Use only new materials for relocated facility. Match materials of existing facility, unless otherwise shown or specified.
  - 4. Perform relocations to minimize downtime of existing facilities.
  - 5. Install new portions of existing facilities in their relocated position prior to removal of existing facilities, unless otherwise accepted by Engineer.

## 1.5 ADJACENT FACILITIES AND PROPERTIES

### A. Examination:

- 1. After Effective Date of the Agreement and before Work at Site is started Contractor, Engineer, and affected property owners and utility owners shall make a thorough examination of pre-existing conditions including existing buildings, structures, and other improvements in the vicinity of Work, as applicable, which could be damaged by construction operations.
- 2. Periodic re-examination shall be jointly performed to include, but not limited to, cracks in structures, settlement, leakage, and similar conditions.

### B. Documentation:

- 1. Record and submit documentation of observations made on examination inspections for signature of Engineer and Contractor and in accordance with paragraph Construction Photographs and Audio-Video Recordings.

2. Upon receipt, Engineer will review, sign, and return one record copy of documentation to Contractor to be kept on file in field office. Such documentation shall be used as indisputable evidence in ascertaining whether and to what extent damage occurred as a result of Contractor's operations, and is for the protection of adjacent property owners, Contractor, and Owner.

#### 1.6 OWNER'S OCCUPANCY

- A. Owner will occupy the premises during the period of construction for the conduct of its normal operations. Cooperate with Owner in all construction operations to minimize conflict and to facilitate Owner usage.

#### 1.7 PARTIAL UTILIZATION BY THE OWNER

- A. Schedule operations for completion of portions of the Work, as designated under Work Sequence/Constraints, herein, for Owner's occupancy or separate operation prior to Substantial Completion of the entire Work.
- B. Unless agreed in writing prior to Owner's use, the following conditions shall apply:
  1. Contractor's Responsibilities:
    - a. Allow access for Owner's personnel.
    - b. Allow operation of ventilation and electrical systems.
    - c. All other responsibilities as specified in the General Conditions.
  2. Owner's Responsibilities:
    - a. Operate ventilating systems and pay cost of same.
    - b. Assume responsibility of power requirements.
    - c. Assume responsibility for security and fire protection in utilized areas, but not extending to Contractor's materials and equipment in utilized areas.
    - d. Assume responsibility for property insurance of utilized areas.
  3. Other Conditions of Owner's Use: The correction period for the occupied or separately operated portion of Work shall commence at the date of Substantial Completion for that separate part.

#### 1.8 PHYSICAL CONDITIONS

- A. Exercise reasonable care to verify locations of existing subsurface facilities and utilities.
- B. Areas immediate and adjacent to planned excavations shall be thoroughly checked by means of visual examination and with electronic metal and pipe detection equipment for indications of underground utilities and facilities.
- C. Make exploratory excavation where existing underground facilities or utilities may potentially conflict with proposed excavations and facilities or where there is reasonable cause to verify the presence or absence of, or to obtain physical information regarding underground facilities or utilities. Conduct exploratory excavations as acceptable to and in the presence of Engineer prior to proceeding with major excavation in the area and sufficiently in advance of construction to avoid possible delays to Contractor's Work. Promptly take measurements, photographs, and obtain survey data.

## 1.9 CONSTRUCTION PHOTOGRAPHS

- A. Photographically document all phases of the project including preconstruction, construction progress, and post-construction.
- B. Engineer shall have the right to select the subject matter and vantage point from which photographs are to be taken.
- C. **Digital Images:** Provide construction photographs in the form of digital images in uncompressed TIFF format, produced by a digital camera with minimum sensor size of 4.0 megapixels, and at an image resolution of not less than 1600 by 1200 pixels.
- D. **Preconstruction and Post-Construction:**
  - 1. After Effective Date of the Agreement and before Work at Site is started, and again upon issuance of Substantial Completion, take exposures of all areas of the Construction Site and property adjacent to perimeter of Construction Site.
  - 2. Particular emphasis shall be directed to structures both inside and outside the Site.
- E. **Construction Progress Photos:**
  - 1. Photographically demonstrate progress of construction, showing every aspect of Site and adjacent properties as well as interior and exterior of new or impacted structures.
  - 2. Take photos as frequent as required to document all major aspects of construction. Coordinate with Engineer.
- F. **Color Prints: (NOT USED)**

## 1.10 AUDIO-VIDEO RECORDINGS

- A. Prior to beginning Work on Construction Site or of a particular area of the Work, and again within 10 days following date of Substantial Completion, video-graph Construction Site and property adjacent to Construction Site.
- B. In the case of preconstruction recording, no Work shall begin in the area prior to Engineer's review and approval of content and quality of video for that area.
- C. Particular emphasis shall be directed to physical condition of existing vegetation, structures, and pavements within Construction Site and areas adjacent to and within the right-of-way or easement, and on Contractor storage and staging areas.
- D. Engineer shall have right to select subject matter and vantage point from which videos are to be taken.
- E. **Video Format and Quality:**
  - 1. DVD format, with sound.
  - 2. **Video:**
    - a. Produce bright, sharp, and clear images with accurate colors, free of distortion and other forms of picture imperfections.

- b. Electronically, and accurately display the month, day, year, and time of day of the recording.
- 3. Audio:
  - a. Audio documentation shall be done clearly, precisely, and at a moderate pace.
  - b. Indicate date, project name, and a brief description of the location of taping, including:
    - 1). Facility name.
    - 2). Street names or easements.
    - 3). Addresses of private property.
    - 4). Direction of coverage, including engineering stationing, if applicable.
- 4. Documentation:
  - a. DVD Label:
    - 1). DVD number (numbered sequentially, beginning with 001).
    - 2). Project name.
    - 3). Date and time of coverage.
- 5. Project Video Log: Maintain an ongoing log that incorporates above noted label information for DVD recordings on Project.

#### 1.11 REFERENCE POINTS AND SURVEYS

- A. Location and elevation of benchmarks are shown on Drawings.
- B. Dimensions for lines and elevations for grades of structures, appurtenances, and utilities are indicated on the Drawings, together with the other pertinent information required for laying out Work. If conditions vary from those indicated, immediately notify Engineer.
- C. Any existing survey points or other control markers destroyed without proper authorization will be replaced by Owner of the survey points or control markers at the Contractor's expense.
- D. Contractor's Responsibilities:
  - 1. Provide additional survey and layout required to layout the Work.
  - 2. Locate and protect reference points prior to staging site preparation.
  - 3. Check and establish exact location of existing facilities prior to construction of new facilities and any connections thereto.
  - 4. In event of discrepancy in data or staking provided by Owner, request clarification before proceeding with Work.
  - 5. Retain professional land surveyor or civil engineer registered in state of Project who shall perform or supervise engineering surveying necessary for additional construction staking and layout.
  - 6. Maintain complete accurate log of survey Work as it progresses as a Record Document.
  - 7. On request of Engineer, submit documentation.
  - 8. Provide competent employee(s), tools, stakes, and other equipment and materials as Engineer may require to:
    - a. Establish control points, lines, and easement boundaries.
    - b. Check layout, survey, and measurement Work performed by others.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

**3.1 CUTTING, FITTING, AND PATCHING**

- A. Cut, fit, adjust, or patch Work and work of others, including excavation and backfill as required, to make Work complete.**
- B. Obtain prior written authorization of Engineer and Owner before commencing work to cut or otherwise alter:**
  - 1. Structural or reinforcing steel, structural column or beam, elevated slab, trusses, or other structural member.**
  - 2. Weather- or moisture-resistant elements.**
  - 3. Efficiency, maintenance, or safety of element.**
  - 4. Work of others.**
- C. Refinish surfaces to provide an even finish.**
  - 1. Refinish continuous surfaces to nearest intersection.**
  - 2. Refinish entire assemblies.**
  - 3. Finish restored surfaces to such planes, shapes, and textures that no transition between existing work and Work is evident in finished surfaces.**
- D. Restore existing work, Underground Facilities, and surfaces that are to remain in completed Work including concrete-embedded piping, conduit, and other utilities as specified and as shown.**
- E. Make restorations with new materials and appropriate methods as specified for new Work of similar nature; if not specified, use recommended practice of manufacturer or appropriate trade association.**
- F. Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces and fill voids.**
- G. Remove specimens of installed Work for testing when requested by Engineer.**

**END OF SECTION 01 31 00**

## SECTION 01 32 00 – CONSTRUCTION PROGRESS DOCUMENTATION

### PART 1 - GENERAL

#### 1.1 SUBMITTALS

##### A. Informational Submittals:

1. **Preliminary Progress Schedule:** Submit at least 7 days prior to preconstruction conference
2. **Detailed Progress Schedule:**
  - a. Submit initial Detailed Progress Schedule within 45 days after Effective Date of the Agreement.
  - b. Submit an Updated Progress Schedule at each update, in accordance with Article Detailed Progress Schedule.
3. **Submit with Each Progress Schedule Submission:**
  - a. Contractor's certification that Progress Schedule submission is actual schedule being utilized for execution of the Work.
  - b. Disk files compatible with latest version of Project Planner (P3) by Primavera Systems, Inc., or similar software as approved by Engineer.
  - c. Progress Schedule: Legible copies.
  - d. Narrative Progress Report: Same number of copies as specified for Progress Schedule.
4. Prior to final payment, submit a final Updated Progress Schedule.

#### 1.2 PRELIMINARY PROGRESS SCHEDULE

- A. In addition to basic requirements outlined in General Conditions, show a detailed schedule, beginning with Notice to Proceed, for minimum duration of 90 days, and a summary of balance of Project through Final Completion.
- B. Show activities including, but not limited to the following:
  1. Notice to Proceed.
  2. Permits.
  3. Submittals, with review time. Contractor may use Schedule of Submittals specified in Section 01 33 00, SUBMITTAL PROCEDURES.
  4. Early procurement activities for long lead equipment and materials.
  5. Initial Site work.
  6. Earthwork.
  7. Specified Work sequences and construction constraints.
  8. Contract Milestone and Completion Dates.
  9. Owner-furnished products delivery dates or ranges of dates.
  10. Major structural, mechanical, equipment, electrical, architectural, and instrumentation and control Work.
  11. System startup summary.
  12. Project close-out summary.
  13. Demobilization summary.
- C. Update Preliminary Progress Schedule monthly; as part of progress payment process. Failure to do so may result in the Owner withholding all or part of the monthly progress payment until the Preliminary Progress Schedule is updated in a manner acceptable to Engineer.

- D. **Format:** In accordance with Article Progress Schedule Critical Path Network.
- E. **Update monthly** to reflect actual progress and occurrences to date, including weather delays.

### 1.3 DETAILED PROGRESS SCHEDULE

- A. **General:** Comprehensive computer-generated schedule using CPM, generally as outlined in Associated General Contractors of America (AGC) 580, "Construction Project Planning and Scheduling Guidelines." If a conflict occurs between the AGC publication and this Specification, this Specification shall govern. Adjust or confirm schedules in accordance with General Conditions on a monthly basis and submit to ENGINEER.
- B. **Contents:**
  - 1. Schedule shall begin with the date of Notice to Proceed and conclude with the date of Final Completion.
  - 2. Identify Work calendar basis using days as a unit of measure.
  - 3. Show complete interdependence and sequence of construction and Project-related activities reasonably required to complete the Work.
  - 4. Identify the Work of separate stages and other logically grouped activities, and clearly identify critical path of activities.
  - 5. Reflect sequences of the Work, restraints, delivery windows, review times, Contract Times and Project Milestones set forth in the Agreement and Section 01 31 00, PROJECT MANAGEMENT AND COORDINATION.
  - 6. Include as applicable, at a minimum:
    - a. Obtaining permits, submittals for early product procurement, and long lead time items.
    - b. Mobilization and other preliminary activities.
    - c. Initial Site work.
    - d. Specified Work sequences, constraints, and Milestones, including
    - e. Substantial Completion date(s) Subcontract Work.
    - f. Major equipment design, fabrication, factory testing, and delivery dates.
    - g. Delivery dates for Owner-furnished products, as specified in Section 01 11 00, SUMMARY OF WORK.
    - h. Site work.
    - i. Concrete Work.
    - j. Structural steel Work.
    - k. Architectural features Work.
    - l. Conveying systems Work.
    - m. Equipment Work.
    - n. Mechanical Work.
    - o. Electrical Work.
    - p. Instrumentation and control Work.
    - q. Interfaces with Owner-furnished equipment.
    - r. Other important Work for each major facility.
    - s. Equipment and system startup and test activities.
    - t. Project closeout and cleanup.
    - u. Demobilization.
  - 7. No activity duration exclusive of those for Submittals review and product fabrication/delivery, shall be less than 1 day and not more than 14 days, unless otherwise approved.

8. Activity duration for Submittal review shall not be less than review time specified unless clearly identified and prior written acceptance has been obtained from Engineer.
  9. If Contractor provides an accepted schedule with an early completion date, Owner reserves the right to reduce Contract Times to match the early completion date by issuing a deductive Change Order at no change in Contract Price.
- C. Network Graphical Display:
1. Plot or print on paper not greater than 30" x 42" or smaller than 22" x 34", unless otherwise approved.
  2. Title Block: Show name of Project, Owner, date submitted, revision or update number, and the name of the scheduler. Updated schedules shall indicate data date.
  3. Identify horizontally across top of schedule the time frame by year, month, and day.
  4. Identify each activity with a unique number and a brief description of the Work associated with that activity.
  5. Indicate the critical path.
  6. Show, at a minimum, the controlling relationships between activities.
  7. Plot activities on a time-scaled basis, with the length of each activity proportional to the current estimate of the duration.
  8. Plot activities on an early start basis unless otherwise requested by Engineer.
  9. Provide a legend to describe standard and special symbols used.
- D. Schedule Report:
1. 8-1/2" x 11" white paper, unless otherwise approved.
  2. List information for each activity in tabular format, including, at a minimum:
    - a. Activity Identification Number.
    - b. Activity Description.
    - c. Original Duration.
    - d. Remaining Duration.
    - e. Early Start Date (Actual start on Updated Progress Schedules).
    - f. Early Finish Date (Actual finish on Updated Progress Schedules).
    - g. Late Start Date.
    - h. Late Finish Date.
    - i. Total Float.
  3. Sort reports, in ascending order, as listed below:
    - a. Activity number sequence with predecessor and successor activity.
- E. Cost -Loading:
1. Note the estimated cost to perform each Work activity, with the exception of Submittals or Submittal reviews, in the network in a tabular listing.
  2. The sum of all activity costs shall equal the Contract Price. An unbalanced or front-end-loaded schedule will not be acceptable.
  3. The accepted cost-loaded Progress Schedule shall constitute the Schedule of Values specified in Section 01 29 00, PAYMENT PROCEDURES.

#### 1.4 PROGRESS OF THE WORK

- A. Updated Progress Schedule shall reflect:
1. Progress of Work to within 5 working days prior to submission.
  2. Approved changes in Work scope and activities modified since submission.
  3. Delays in Submittals or re-submittals, deliveries, or Work.
  4. Adjusted or modified sequences of Work.

5. Other identifiable changes.
  6. Revised projections of progress and completion.
  7. Report of changed logic.
- B. Produce detailed sub schedules during Project, upon request of Owner or Engineer, to further define critical portions of the Work such as facility shutdowns.
  - C. If Contractor fails to complete activity by its latest scheduled completion date and this Failure is anticipated to extend Contract Times (or Milestones), Contractor shall, within 7 days of such failure, submit a written statement as to how Contractor intends to correct nonperformance and return to acceptable current Progress Schedule. Actions by Contractor to complete the Work within Contract Times (or Milestones) will not be justification for adjustment to Contract Price or Contract Times.
  - D. Owner may order Contractor to increase plant, equipment, labor force or working hours if Contractor fails to:
    1. Complete an activity by its completion date.
    2. Satisfactorily execute Work as necessary to prevent delay to overall completion of Project, at no additional cost to Owner.

#### 1.5 SCHEDULE ACCEPTANCE

- A. Engineer's acceptance will demonstrate agreement that:
  1. Proposed schedule is accepted with respect to:
    - a. Contract Times, including Final Completion are within the specified times.
    - b. Specified Work sequences and constraints are shown as specified.
    - c. Access restrictions are accurately reflected.
    - d. Startup and testing times are as specified.
    - e. Submittal review times are as specified.
    - f. Startup testing duration is as specified and timing is acceptable.
  2. In all other respects, Engineer's acceptance of Contractor's schedule indicates that in the Engineer's judgment, the schedule represents reasonable plan for constructing Project in accordance with the Contract Documents. Engineer's review will not make any change in Contract requirements. Lack of comment on any aspect of schedule that is not in accordance with the Contract Documents will not thereby indicate acceptance of that change, unless Contractor has explicitly called the nonconformance to Engineer's attention in submittal. Schedule remains Contractor's responsibility and Contractor retains responsibility for performing all activities, for activity durations, and for activity sequences required to construct Project in accordance with the Contract Documents.
- B. Unacceptable Preliminary Progress Schedule:
  1. Make requested corrections; resubmit within 10 days.
  2. Until acceptable to Engineer as Baseline Progress Schedule, continue review and revision process, during which time Contractor shall update schedule on a monthly basis to reflect actual progress and occurrences to date.
- C. Unacceptable Detailed Progress Schedule:
  1. Make requested corrections; resubmit within 10 days.
  2. Until acceptable to Engineer as Baseline Progress Schedule, continue review and revision process.

- D. **Narrative Report:** All changes to activity duration and sequences, including addition or deletion of activities subsequent to Engineer's acceptance of Baseline Progress Schedule shall be delineated in Narrative Report current with proposed Updated Progress Schedule.

#### 1.6 ADJUSTMENT OF CONTRACT TIMES

- A. Reference the General Conditions and Section 01 26 00, **CONTRACT MODIFICATION PROCEDURES.**
- B. Evaluation and reconciliation of Adjustments of Contract Times shall be based on the Updated Progress Schedule at the time of proposed adjustment or claimed delay.
- C. **Float:**
  - 1. Float time is a Project resource available to both parties to meet contract Milestones and Contract Times.
  - 2. Use of float suppression techniques, such as preferential sequencing or logic, special lead/lag logic restraints, and extended activity times are prohibited. Use of float time disclosed or implied by use of alternate float-suppression techniques shall be shared to proportionate benefit of Owner and Contractor.
  - 3. Pursuant to above float-sharing requirement, no time extensions will be granted nor delay damages paid until a delay occurs, which:
    - a. Impacts Project's critical path,
    - b. Consumes all available float or contingency time, and
    - c. Extends Work beyond contract completion date.
- D. **Claims Based on Contract Times:**
  - 1. Where Engineer has not yet rendered formal decision on Contractor's Claim for adjustment of Contract Times, and parties are unable to agree as to amount of adjustment to be reflected in Progress Schedule, Contractor shall reflect an interim adjustment in the Progress Schedule as acceptable to Engineer.
  - 2. It is understood and agreed that such interim acceptance will not be binding on either Contractor or Owner, and will be made only for the purpose of continuing to schedule Work until such time as formal decision has been rendered as to an adjustment, if any, of the Contract Times.
  - 3. Contractor shall revise Progress Schedule prepared thereafter in accordance with Engineer's formal decision.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION 01 32 00**

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## SECTION 01 33 00 – SUBMITTAL PROCEDURES

### PART 1 - GENERAL

#### 1.1 DEFINITIONS

- A. **Action Submittal:** Written and graphic information submitted by Contractor that requires Engineer's approval.
- B. **Informational Submittal:** Information submitted by Contractor that does not require Engineer's approval.

#### 1.2 PROCEDURES

- A. **Direct Submittals to Engineer.**
- B. **Transmittal of Submittal:**
  - 1. **Contractor shall:**
    - a. **Review each submittal and check for compliance with Contract Documents.**
    - b. **Stamp each submittal with uniform approval stamp before submitting to Engineer.**
      - 1). **Stamp to include Project name, submittal number, Specification number, Contractor's reviewer name, date of Contractor's approval and statement certifying that submittal has been reviewed, checked, and approved for compliance with Contract Documents.**
      - 2). **Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.**
  - 2. **Complete, sign, and transmit with each submittal package, one Transmittal of Contractor's Submittal form. A blank Transmittal of Contractor's Submittal form shall be provided by Engineer.**
  - 3. **Identify Each Submittal with the Following:**
    - a. **Numbering and Tracking System:**
    - b. **Sequentially number each submittal.**
    - c. **Resubmission of submittal shall have original number with sequential alphabetic suffix.**
      - 1). **Specification section and paragraph to which submittal applies.**
      - 2). **Project title and Engineer's project number.**
      - 3). **Date of transmittal.**
      - 4). **Names of Contractor, subcontractor or Supplier and Manufacturer as appropriate.**
  - 4. **Identify and describe each deviation or variation from Contract Documents.**
- C. **Format:**
  - 1. **Do not base Shop Drawings on reproductions of Contract Documents.**
  - 2. **Package submittal information by individual Specification section. Do not combine different Specification sections together in submittal package, unless otherwise directed in Specification.**
  - 3. **Present in a clear and thorough manner and in sufficient detail to show kind, size, arrangement, and function of components, materials, and devices, and compliance with Contract Documents.**
  - 4. **Index with labeled tab dividers in orderly manner.**

- D. **Timeliness:** Schedule and submit in accordance Schedule of Submittals, and requirements of individual Specification sections.
- E. **Processing Time:**
  - 1. Time for review shall commence on Engineer's receipt of submittal.
  - 2. Engineer will act upon Contractor's submittal and transmit response to Contractor not later than fifteen (15) days after receipt, unless otherwise specified.
  - 3. Re-submittals will be subject to same review time.
  - 4. No adjustment of Contract Times or Price will be allowed due to delays in progress of Work caused by rejection and subsequent re-submittals.
- F. **Re-submittals:** Clearly identify each correction or change made.
- G. **Incomplete Submittals:**
  - 1. Engineer will return entire submittal for Contractor's revision if preliminary review deems it incomplete.
  - 2. When any of the following are missing, submittal will be deemed incomplete:
    - a. Contractor's review stamp completed and signed.
    - b. Transmittal of Contractor's Submittal completed and signed.
    - c. Insufficient number of copies.
  - 3. Submittals not required by Contract Documents will not be reviewed and will be returned stamped "Not Subject to Review."
  - 4. Engineer will keep one copy and return all remaining copies to Contractor.

### 1.3 ACTION SUBMITTALS

- A. Prepare and submit Action Submittals required by individual Specification sections.
- B. **Shop Drawings:**
  - 1. Copies: Six.
  - 2. Identify and Indicate:
    - a. Applicable Contract Drawing and Detail number, products, units and assemblies, and system or equipment identification or tag numbers.
    - b. Equipment and Component Title: Identical to title shown on Drawings.
    - c. Critical field dimensions and relationships to other critical features of Work. Note dimensions established by field measurement.
    - d. Project-specific information drawn accurately to scale.
  - 3. Manufacturer's standard schematic drawings and diagrams as follows:
    - a. Modify to delete information that is not applicable to the Work.
    - b. Supplement standard information to provide information specifically applicable to the Work.
  - 4. Product Data: Provide as specified in individual Specifications.
  - 5. Foreign Manufacturers: When proposed, include following additional information:
    - a. Names and addresses of at least two companies that maintain technical service representatives close to Project.
    - b. Complete list of spare parts and accessories for each piece of equipment.
- C. **Samples:**
  - 1. Copies: One, unless otherwise specified in individual Specifications.
  - 2. Preparation: Mount, display, or package Samples in manner specified to facilitate review of quality. Attach label on unexposed side that includes the following:

- a. **Manufacturer name.**
  - b. **Model number.**
  - c. **Material.**
  - d. **Sample source.**
  - 3. **Manufacturer's Color Chart:** Units or sections of units showing full range of colors, textures, and patterns available.
  - 4. **Full-size Samples:**
    - a. **Size as indicated in individual Specification section.**
    - b. **Prepared from same materials to be used for the Work.**
    - c. **Cured and finished in manner specified.**
    - d. **Physically identical with product proposed for use.**
- D. Action Submittal Dispositions:** Engineer will review, mark, and stamp as appropriate, and distribute marked-up copies as noted:
- 1. **Approved:**
    - a. **Contractor may incorporate product(s) or implement Work covered by submittal.**
    - b. **Distribution**
      - 1). **One copy furnished Resident Project Representative.:**
      - 2). **Two copies retained in Engineer's file.**
      - 3). **Remaining copies returned to Contractor appropriately annotated.**
  - 2. **Approved as Noted:**
    - a. **Contractor may incorporate product(s) or implement Work covered by submittal, in accordance with Engineer's notations.**
    - b. **Distribution:**
      - 1). **One copy furnished Resident Project Representative.**
      - 2). **Two copies retained in Engineer's file.**
      - 3). **Remaining copies returned to Contractor appropriately annotated.**
  - 3. **Partial Approval, re-submit as Noted:**
    - a. **Make corrections or obtain missing portions, and resubmit.**
    - b. **Except for portions indicated, Contractor may begin to incorporate product(s) or implement Work covered by submittal, in accordance with Engineer's notations.**
    - c. **Distribution:**
      - 1). **One copy furnished Resident Project Representative**
      - 2). **Two copies retained in Engineer's file.**
      - 3). **Remaining copies returned to Contractor appropriately annotated.**
  - 4. **Revise and Resubmit:**
    - a. **Contractor may not incorporate product(s) or implement Work covered by submittal.**
    - b. **Distribution:**
      - 1). **One copy furnished Resident Project Representative.**
      - 2). **Two copies retained in Engineer's file.**
      - 3). **Remaining copies returned to Contractor appropriately annotated.**

#### 1.4 INFORMATIONAL SUBMITTALS

##### A. General:

- 1. **Copies:** Submit four copies, unless otherwise indicated in individual Specification section.
- 2. **Refer to individual Specification sections for specific submittal requirements.**
- 3. **Engineer will review each submittal. If submittal meets conditions of the Contract, Engineer will forward copies to appropriate parties. If Engineer determines submittal**

does not meet conditions of the Contract and is therefore considered unacceptable, Engineer will retain one copy and return remaining copies with review comments to Contractor, and require that submittal be corrected and resubmitted.

4. **Application for Payment:** In accordance with Section 01 29 00, PAYMENT PROCEDURES.
5. **Certificates:**
  - a. **General:**
    - 1). Provide notarized statement that includes signature of entity responsible for preparing certification.
    - 2). Signed by officer or other individual authorized to sign documents on behalf of that entity.
    - 3) **Welding:** In accordance with individual Specification sections.
    - 4) **Installer:** Prepare written statements on Manufacturer's letterhead certifying that installer complies with requirements as specified in individual Specification sections.
    - 5) **Material Test:** Prepared by qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
    - 6) **Certificates of Successful Testing or Inspection:** Submit when testing or inspection is required by Laws and Regulations or governing agency or specified in individual Specification sections.
    - 7) **Manufacturer's Certificate of Compliance.**
    - 8) **Manufacturer's Certificate of Proper Installation.**
- B. **Construction Photographs and Video:** In accordance with Section 01 31 00, PROJECT MANAGEMENT AND COORDINATION, and as may otherwise be required in Contract Documents.
- C. **Contract Closeout Submittals:** In accordance with Section 01 77 00, CLOSEOUT PROCEDURES.
- D. **Contractor-Design Data:**
  1. **Written and graphic information.**
  2. **List of assumptions.**
  3. **List of performance and design criteria.**
  4. **Summary of loads or load diagram, if applicable.**
  5. **Calculations.**
  6. **List of applicable codes and regulations.**
  7. **Name and version of software.**
  8. **Information requested in individual Specification section.**
- E. **Manufacturer's Instructions:** Written or published information that documents Manufacturer's recommendations, guidelines, and procedures in accordance with individual Specification sections.
- F. **Schedules:**
  1. **Schedule of Submittals:** Prepare separately or in combination with Progress Schedule as specified in Section 01 32 00, CONSTRUCTION PROGRESS DOCUMENTATION.
    - a. **Show for Each, at a Minimum, the Following:**

- 1). Specification section number.
  - 2). Identification by numbering and tracking system as specified under Paragraph Transmittal of Submittal.
  - 3). Estimated date of submission to Engineer, including reviewing and processing time.
- b. On a monthly basis, submit updated schedule to Engineer if changes have occurred or re-submittals are required.
2. Schedule of Values: In accordance with Section 01 29 00, PAYMENT PROCEDURES.
  3. Schedule of Estimated Progress Payments: In accordance with Section 01 32 00, CONSTRUCTION PROGRESS DOCUMENTATION.
  4. Progress Schedules: In accordance with Section 01 32 00, CONSTRUCTION PROGRESS DOCUMENTATION.
- G. Special Guarantee: Supplier's written guarantee as required in individual Specification sections.
- H. Statement of Qualification: Evidence of qualification, certification, or registration as required in Contract Documents to verify qualifications of professional land surveyor, engineer, materials testing laboratory, specialty Subcontractor, trade, Specialist, consultant, installer, and other professionals.
- I. Submittals Required by Laws, Regulations, and Governing Agencies:
1. Submit promptly notifications, reports, certifications, payrolls, and otherwise as may be required, directly to the applicable Federal, State, or local governing agency or their representative.
  2. Transmit to Engineer for Owner's records one copy of correspondence and transmittals (to include enclosures and attachments) between Contractor and governing agency.
- J. Test and Inspection Reports:
1. General: Shall contain signature of person responsible for test or report.
  2. Factory:
    - a. Identification of product and Specification section, type of inspection or test with referenced standard or code.
    - b. Date of test, Project title and number, and name and signature of authorized person.
    - c. Test results.
    - d. If test or inspection deems material or equipment not in compliance with Contract Documents, identify corrective action necessary to bring into compliance.
    - e. Provide interpretation of test results, when requested by Engineer.
    - f. Other items as identified in individual Specification sections.
  3. Field: As a minimum, include the following:
    - a. Project title and number.
    - b. Date and time.
    - c. Record of temperature and weather conditions.
    - d. Identification of product and Specification section.
    - e. Type and location of test, Sample, or inspection, including referenced standard or code.
    - f. Date issued, testing laboratory name, address, and telephone number, and name and signature of laboratory inspector.
    - g. If test or inspection deems material or equipment not in compliance with Contract Documents, identify corrective action necessary to bring into compliance.

- h. Provide interpretation of test results, when requested by Engineer.
  - i. Other items as identified in individual Specification sections.
4. Testing and Startup Data.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION 01 33 00**

## SECTION 01 40 00 - QUALITY REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including all General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. City of Huntsville, Engineering Department, Standard Specifications For Construction of New Sanitary Sewers, The Design and Acceptance Manual For Force mains and Pump Stations, Latest Revisions.

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-assurance and -control services required by Owner, Owner's Representative or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections include the following:
  - 1. City of Huntsville Standard Testing Procedures.

#### 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 Owner or Owner's Representative.

- C. **Preconstruction Testing:** Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- 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 industry standards.
- E. **Source Quality-Control Testing:** Tests and inspections that are performed at the source, i.e., 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.
  - I. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- I. **Experienced:** When used with an entity, "experienced" means having successfully completed a minimum of five (5) previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

#### 1.4 CONFLICTING REQUIREMENTS

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

## 1.5 SUBMITTALS

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

## 1.6 QUALITY ASSURANCE

- A. **General:** Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. **Installer Qualifications:** A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

- C. **Manufacturer Qualifications:** A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. **Fabricator Qualifications:** A firm experienced in producing products 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.
- 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 to those indicated for this Project in material, design, and extent.
- F. **Specialists:** Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
  - 1. Requirement for specialists shall not supersede building codes and regulations governing the Work.
- G. **Testing Agency Qualifications:** An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
  - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. **Factory-Authorized Service Representative Qualifications:** An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. **Preconstruction Testing:** Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
  - 1. Contractor responsibilities include the following:
    - a. Provide test specimens representative of proposed products and construction.
    - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
    - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
    - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
    - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.

f. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.

2. **Testing Agency Responsibilities:** Submit a certified written report of each test, inspection, and similar quality-assurance service to Owner or Owner's Representative, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

## 1.7 QUALITY CONTROL

- A. **Owner Responsibilities:** Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
  2. Notify testing agencies at least twenty-four (24) hours in advance of time when Work that requires testing or inspecting will be performed.
  3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. **Manufacturer's Field Services:** Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."
- D. **Retesting/Reinspecting:** Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. **Testing Agency Responsibilities:** Cooperate with Owner, Owner's Representative and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Owner or Owner's Representative 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.
- F. **Associated Services:** Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  4. Facilities for storage and field curing of test samples.
  5. Delivery of samples to testing agencies.
  6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- H. **Schedule of Tests and Inspections:** Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within thirty (30) days of date established for the Notice to Proceed.
1. **Distribution:** Distribute schedule to Owner or Owner's Representative testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

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

**PART 3 - EXECUTION**

**3.1 TEST AND INSPECTION LOG**

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

**3.2 REPAIR AND PROTECTION**

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.**
  - 1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.**
  - 2. Comply with the Contract Document requirements for Division 01 Section "Cutting and Patching."**
- 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 01 40 00**

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## SECTION 01 42 00 - REFERENCES

### PART 1 - GENERAL

#### 1.1 REFERENCE TO STANDARDS AND SPECIFICATIONS OF TECHNICAL SOCIETIES

- A. Reference to standards and specifications of technical societies and reporting and resolving discrepancies associated therewith shall be as provided in the General Conditions, and as may otherwise be required herein and in the individual Specification sections.
- B. Work specified by reference to published standard or specification of government agency, technical association or trade association, professional society or institute, testing agency, or other organization shall meet requirements or surpass minimum standards of quality for materials and workmanship established by designated standard or specification.
- C. Where so specified, products or workmanship shall also meet or exceed additional prescriptive or performance requirements included within Contract Documents to establish a higher or more stringent standard of quality than required by referenced standard.
- D. Where two or more standards are specified to establish quality, product and workmanship shall meet or exceed requirements of most stringent.
- E. Where both a standard and a brand name are specified for a product in Contract Documents, proprietary product named shall meet or exceed requirements of specified reference standard.
- F. Copies of Standards and Specifications of Technical Societies:
  - 1. Copies of applicable referenced standards have not been bound in these Contract Documents.
  - 2. Where copies of standards are needed by Contractor, obtain a copy or copies directly from publication source and maintain in an orderly manner at the Site as Work Site records, available to Contractor's personnel, Subcontractors, Owner, and Engineer.

#### 1.2 ABBREVIATIONS

- A. Abbreviations for trade organizations and government agencies: Following is a list of construction industry organizations and government agencies to which references may be made in the Contract Documents, with abbreviations used.
  - 1. AA Aluminum Association
  - 2. AABC Associated Air Balance Council
  - 3. AAMA American Architectural Manufacturers Association
  - 4. AASHTO American Association of State Highway and Transportation Officials
  - 5. ABMA American Bearing Manufacturers' Association
  - 6. ACI American Concrete Institute
  - 7. AEIC Association of Edison Illuminating Companies
  - 8. AGA American Gas Association
  - 9. AGMA American Gear Manufacturers' Association
  - 10. AI Asphalt Institute
  - 11. AISC American Institute of Steel Construction
  - 12. AISI American Iron and Steel Institute
  - 13. AITC American Institute of Timber Construction
  - 14. ALS American Lumber Standards

15. AMCA Air Movement and Control Association
16. ANSI American National Standards Institute
17. APA APA - The Engineered Wood Association
18. API American Petroleum Institute
19. APWA American Public Works Association
20. ARI Air-Conditioning and Refrigeration Institute
21. ASAE American Society of Agricultural Engineers
22. ASCE American Society of Civil Engineers
23. ASHRAE American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
24. ASME American Society of Mechanical Engineers
25. ASNT American Society for Nondestructive Testing
26. ASTM ASTM International
27. AWI Architectural Woodwork Institute
28. AWPA American Wood Preservers' Association
29. AWPI American Wood Preservers' Institute
30. AWS American Welding Society
31. AWWA American Water Works Association
32. BHMA Builders Hardware Manufacturers' Association
33. CBM Certified Ballast Manufacturer
34. CDA Copper Development Association
35. CGA Compressed Gas Association
36. CIS PI Cast Iron Soil Pipe Institute
37. CMAA Crane Manufacturers' Association of America
38. CRSI Concrete Reinforcing Steel Institute
39. CS Commercial Standard
40. CSA Canadian Standards Association
41. CSI Construction Specifications Institute
42. DIN Deutsches Institute für Normung e.V.
43. DIPRA Ductile Iron Pipe Research Association
44. EIA Electronic Industries Alliance
45. EJCDC Engineers Joint Contract Documents' Committee
46. ETL Electrical Test Laboratories
47. FAA Federal Aviation Administration
48. FCC Federal Communications Commission
49. FDA Food and Drug Administration
50. FEMA Federal Emergency Management Agency
51. FIPS Federal Information Processing Standards
52. PM Factory Mutual
53. Fed. Spec. Federal Specifications (FAA Specifications)
54. FS Federal Specifications and Standards (Technical Specifications)
55. GA Gypsum Association
56. GANA Glass Association of North America
57. ID Hydraulic Institute
58. HMI Hoist Manufacturers' Institute
59. IBC International Building Code
60. ICBO International Conference of Building Officials
61. ICC International Code Council
62. ICEA Insulated Cable Engineers' Association
63. IFC International Fire Code
64. IEEE Institute of Electrical and Electronics Engineers, Inc.

65. IESNA Illuminating Engineering Society of North America
66. IFI Industrial Fasteners Institute
67. IGMA Insulating Glass Manufacturer's Alliance
68. IMC International Mechanical Code
69. INDA Association of the Non-woven Fabrics Industry
70. IPC International Plumbing Code
71. ISA Instrumentation, Systems, and Automation
72. ISO International Organization for Standardization
73. ITL Independent Testing Laboratory
74. JIC Joint Industry Conferences of Hydraulic Manufacturers
75. MIA Marble Institute of America
76. Mil. Military Specifications
77. MMA Monorail Manufacturers' Association
78. NAAMM National Association of Architectural Metal Manufacturers
79. NACE NACE International
80. NEBB National Environmental Balancing Bureau
81. NEC National Electrical Code
82. NECA National Electrical Contractor's Association
83. NEMA National Electrical Manufacturers' Association
84. NESC National Electrical Safety Code
85. NETA International Electrical Testing Association
86. NFPA National Fire Protection Association
87. NHLA National Hardwood Lumber Association
88. NICET National Institute for Certification in Engineering Technologies
89. NIST National Institute of Standards and Technology
90. NRCA National Roofing Contractors Association
91. NRTL Nationally Recognized Testing Laboratories
92. NSF NSF International
93. NSPE National Society of Professional Engineers
94. NTMA National Terrazzo and Mosaic Association
95. NWWDA National Wood Window and Door Association
96. OSHA Occupational Safety and Health Act (both Federal and State)
97. PCI Pre-cast/Pre-stressed Concrete Institute
98. PEI Porcelain Enamel Institute
99. PPI Plastic Pipe Institute
100. PS Product Standards Section-U.S. Department of Commerce
101. RMA Rubber Manufacturers' Association
102. RUS Rural Utilities Service
103. SAE Society of Automotive Engineers
104. SDI Steel Deck Institute
105. SDI Steel Door Institute
106. SJI Steel Joist Institute
107. SMACNA Sheet Metal and Air Conditioning Contractors National Association
108. SPI Society of the Plastics Industry
109. SSPC The Society for Protective Coatings
110. SWI Steel Window Institute
111. TEMA Tubular Exchanger Manufacturers' Association
112. TCA Tile Council of North America
113. TIA Telecommunications Industry Association
114. UBC Uniform Fire Code
115. UL Underwriters Laboratories Inc.

- 116. UMC Uniform Mechanical Code
- 117. USBR U.S. Bureau of Reclamation
- 118. WCLIB West Coast Lumber Inspection Bureau
- 119. WWPA Western Wood Products Association

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 42 00

## SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

### PART 1 - GENERAL

#### 1.1 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Association of Nurserymen: American Standards for Nursery Stock.
  2. Federal Emergency Management Agency.
  3. NFPA, National Fire Prevention Standard for Safeguarding Building Construction Operations.
  4. Telecommunications Industry Association (TIA); Electronic Industries Alliance (EIA): 568B, Commercial Building Telecommunications Cabling Standard.
  5. U.S. Department of Agriculture: Urban Hydrology for Small Watersheds.
  6. U.S. Weather Bureau: Rainfall-Frequency Atlas of the U.S. for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years.

#### 1.2 SUBMITTALS

- A. Informational Submittals:
1. Copies of permits and approvals for construction as required by Laws and Regulations and governing agencies.
  2. Temporary Utility Submittals:
    - a. Electric power supply and distribution plans.
    - b. Water supply and distribution plans.
    - c. Drainage plans.
    - d. Sanitary sewer.
  3. Temporary Construction Submittals:
    - a. Access Roads: Routes, cross-sections, and drainage facilities.
    - b. Parking area plans.
    - c. Contractor's storage yard, and storage building plans including gravel surfaced area.
    - d. Fencing and protective barrier locations and details.
    - e. Staging area location plan.
    - f. Traffic and Pedestrian Control and Routing Plans: As specified herein, and proposed revisions thereto.
  4. Temporary Control Submittals:
    - a. Noise control plan.
    - b. Plan for disposal of waste materials and intended haul routes.

#### 1.3 MOBILIZATION

- A. Mobilization shall include, but Not be Limited to, these Principal Items:
1. Obtaining required permits, bonds, insurance, etc.
  2. Moving Contractor's field office and equipment required for first month operations onto Site.
  3. Installing temporary construction power, wiring, and lighting facilities.
  4. Providing onsite communication facilities, including telephones.

5. Providing onsite sanitary facilities and potable water facilities as specified and as required by Laws and Regulations, and governing agencies.
6. Arrange for and erection of Contractor's work and storage yard.
7. Posting OSHA required notices and establishing safety programs and procedures.
8. Have Contractor's superintendent at Site full time.
9. Clearing and Grubbing as needed for project easements.
10. Traffic Control as needed.

B. Use area designated for Contractor's temporary facilities as shown on Drawings.

#### 1.4 PROTECTION OF WORK AND PROPERTY

- A. Comply with Owner's safety rules while on Owner's property.
- B. Keep Owner informed of serious onsite accidents and related claims.
- C. Use of Explosives: No blasting or use of explosives will be allowed onsite.

#### 1.5 VEHICULAR TRAFFIC

- A. Traffic Routing Plan: Show sequences of construction affecting use of roadways, time required for each phase of the Work, provisions for decking over excavations and phasing of operations to provide necessary access, and plans for signing, barricading, and striping to provide passages for pedestrians and vehicles.

### PART 2 - PRODUCTS

#### 2.1 ENGINEER'S FIELD OFFICES (NOT USED)

### PART 3 - EXECUTION

#### 3.1 ENGINEER'S FIELD OFFICE (NOT USED)

#### 3.2 PROTECTION OF WORK AND PROPERTY

- A. General:
  1. Perform Work within right-of-way and easements in a systematic manner that minimizes inconvenience to property owners and the public.
  2. Schedule the Work so construction will not interfere with irrigation of cultivated lands or pasturelands. Construction may proceed during irrigation season, provided Contractor constructs temporary irrigation ditches, turnouts, and miscellaneous structures acceptable to property owners.

3. Provide continuous access for livestock through farm areas. Do not cut off ready access to portions of farmlands in which livestock are pastured. Maintain existing fences required to restrain livestock. Keep gates closed and secure.
4. Maintain in continuous service all existing oil and gas pipelines, underground power, telephone or communication cable, water mains, irrigation lines, sewers, poles and overhead power, and all other utilities encountered along line of the Work, unless other arrangements satisfactory to owners of said utilities have been made.
5. Where completion of the Work requires temporary or permanent removal or relocation of existing utility, coordinate all activities with owner of said utility and perform all work to their satisfaction.
6. Protect, shore, brace, support, and maintain underground pipes, conduits, drains, and other underground utility construction uncovered or otherwise affected by construction operations.
7. In areas where Contractor's operations are adjacent to or near a utility, such as gas, telephone, television, electric power, water, sewer, or irrigation system, and such operations may cause damage or inconvenience, suspend operations until arrangements necessary for protection have been made by Contractor.
8. Notify property owners and utility offices that may be affected by construction operation at least 2 days in advance: Before exposing a utility, obtain utility owner's permission. Should service of a utility become interrupted due to Contractor's operation, notify proper authority immediately. Cooperate with said authority in restoring service as promptly as possible and bear costs incurred.
9. Do not impair operation of existing sewer system. Prevent construction material, pavement, concrete, earth, volatile and corrosive wastes, and other debris from entering sewers, pump stations, or other sewer structures.
10. Maintain original Site drainage wherever possible.

**B. Site Security:**

1. Erect a temporary security fence for protection of existing facilities. Maintain fence throughout construction period. Obtain Engineer's written permission before removal of temporary security fencing.
2. Provide and maintain additional temporary security fences as necessary to protect the Work and Contractor-furnished products not yet installed.

**C. Barricades, Lights, Signs, and Equipment:**

1. Provide as required by the Alabama Department of Transportation Standard Specifications and in sufficient quantity to safeguard public and the Work.
2. Provide as necessary to prevent unauthorized entry to construction areas and affected roads, streets, and alleyways, inside and outside of fenced area, and as required to ensure public safety and the safety of Contractor's employees, other employer's employees, and others who may be affected by the Work.
3. Provide to protect existing facilities and adjacent properties from potential damage.
4. Locate to enable access by facility operators and property owners.
5. Protect streets, roads, highways, and other public thoroughfares that are closed to traffic by effective barricades with acceptable warning signs.
6. Locate barricades at the nearest intersecting public thoroughfare on each side of the blocked section.
7. Illuminate barricades and obstructions with warning lights from sunset to sunrise.

**D. Trees and Plantings:**

1. Protect from damage and preserve trees, shrubs, and other plants outside limits of the Work and within limits of the Work, which are designated on the Drawings to remain undisturbed.
- E. Existing Structures:
1. Where Contractor contemplates removal of small structures such as mailboxes, signposts, and culverts that interfere with Contractor's operations, obtain approval of property owner and Engineer.
  2. Move mailboxes to temporary locations accessible to postal service.
  3. Replace items removed in their original location and a condition equal to or better than original.
- F. Finished Construction: Protect finished floors and concrete floors exposed as well as those covered with composition tile or other applied surfacing.
- G. Waterways: Keep ditches, culverts, and natural drainages continuously free of construction materials and debris.
- H. Dewatering: Construct, maintain, and operate cofferdams, channels, flume drains, sumps, pumps, or other temporary diversion and protection works. Furnish materials required, install, maintain, and operate necessary pumping and other equipment for the environmentally safe removal and disposal of water from the various parts of the Work. Maintain foundations and parts of the Work free from water.

### 3.3 TEMPORARY CONTROLS

- A. Air Pollution Control:
1. Minimize air pollution from construction operations.
  2. Burning: Of waste materials, rubbish, or other debris will not be permitted on or adjacent to Site.
  3. Conduct operations of dumping rock and of carrying rock away in trucks to cause a minimum of dust. Give unpaved streets, roads, detours, or haul roads used in construction area a dust-preventive treatment or periodically water to prevent dust. Strictly adhere to applicable environmental regulations for dust prevention.
  4. Provide and maintain temporary dust-tight partitions, bulkheads, or other protective devices during construction to permit normal operation of existing facilities. Construct partitions of plywood, insulating board, plastic sheets, or similar material. Construct partitions in such a manner that dust and dirt from demolition and cutting will not enter other parts of existing building or facilities. Remove temporary partitions as soon as need no longer exists.
- B. Noise Control:
1. Noise Control Plan: Propose plan to mitigate construction noise and to comply with noise control ordinances, including method of construction, equipment to be used, and acoustical treatments.
- C. Water Pollution Control:
1. Divert sanitary sewage and non-storm waste flow interfering with construction and requiring diversion to sanitary sewers. Do not cause or permit action to occur which would cause an overflow to existing waterway.

2. Prior to commencing excavation and construction, obtain Engineer's agreement with detailed plans showing procedures intended to handle and dispose of sewage, groundwater, and storm water flow, including dewatering pump discharges.
  3. Comply with procedures outlined in U.S. Environmental Protection Agency manuals entitled, "Guidelines for Erosion and Sedimentation Control Planning," "Implementation, Processes, Procedures, and Methods to Control Pollution Resulting from All Construction Activity," and "Erosion and Sediment Control- Surface Mining in Eastern United States."
  4. Do not dispose of volatile wastes such as mineral spirits, oil, chemicals, or paint thinner in storm or sanitary drains. Disposal of wastes into streams or waterways is prohibited. Provide acceptable containers for collection and disposal of waste materials, debris, and rubbish.
- D. Erosion, Sediment, and Flood Control: Provide, maintain, and operate temporary facilities to control erosion and sediment releases, and to protect the Work and existing facilities from flooding during construction period.

### 3.4 STORAGE YARDS AND BUILDINGS

- A. Coordinate requirements with Section 01 60 00, PRODUCT REQUIREMENTS.
- B. Temporary Storage Yards: Construct temporary storage yards for storage of products that are not subject to damage by weather conditions.
- C. Temporary Storage Buildings:
  1. Provide environmental control systems that meet recommendations of manufacturers of equipment and materials stored.
  2. Arrange or partition to provide security of contents and ready access for inspection and inventory.
  3. Store combustible materials (paints, solvents, fuels) in a well-ventilated and remote building meeting safety standards.
  4. Provide, at a minimum, one temporary storage building or storage trailer to house specified spare part during the duration of construction and until spare parts are accepted by Owner and Engineer.

### 3.5 ACCESS ROADS

- A. Construct access roads as required and within easements, rights-of-way, or Project limits. Obtain Engineer's approval of access roads.
- B. Maintain drainage ways. Install and maintain culverts to allow water to flow beneath access roads. Provide corrosion-resistant culvert pipe of adequate strength to resist construction loads.
- C. Provide gravel, crushed rock, or other stabilization material to permit access by all motor vehicles at all times.
- D. Maintain road grade and crown to eliminate potholes, rutting, and other irregularities that restrict access.

- E. Coordinate with Engineer detours and other operations affecting traffic and access. Provide at least 72 hours notice to Engineer of operations that will alter access to the Site.
- F. Where access road crosses existing fences, install and maintain gates.
- G. Upon completion of construction, restore ground surface disturbed by access road construction to original grade. Replace damaged or broken culverts with new culvert pipe of same diameter and material.

### 3.6 PARKING AREAS

- A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, Owner's operations, or construction operations.
- B. Provide parking facilities for personnel working on the Project. No employee or equipment parking will be permitted on Owner's existing parking areas, except as specifically designated for Contractor's use.

### 3.7 VEHICULAR TRAFFIC

- A. Comply with Laws and Regulations regarding closing or restricting use of public streets or highways. No public or private road shall be closed, except by written permission of proper authority. Assure the least possible obstruction to traffic and normal commercial pursuits.
- B. Conduct the Work to interfere as little as possible with public travel, whether vehicular or pedestrian.
- C. Whenever it is necessary to cross, close, or obstruct roads, driveways, and walks, whether public or private, provide and maintain suitable and safe bridges, detours, or other temporary expedients for accommodation of public and private travel.
- D. Coordinate traffic routing with that of others working in same or adjacent areas.

### 3.8 CLEANING DURING CONSTRUCTION

- A. In accordance with General Conditions, as may be specified in other Specification sections, and as required herein.
- B. Wet down exterior surfaces prior to sweeping to prevent blowing of dust and debris. At least weekly, sweep all floors (basins, tunnels, platforms, walkways, roof surfaces), and pick up all debris and dispose.
- C. Provide approved containers for collection and disposal of waste materials, debris, and rubbish. At least at weekly intervals, dispose of such waste materials, debris, and rubbish offsite.
- D. At least weekly, brush sweep entry drive and roadways, and all other streets and walkways affected by the Work and where adjacent to the Work.

**END OF SECTION 01 50 00**

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## SECTION 01 60 00 – PRODUCT REQUIREMENTS

### PART 1 GENERAL

#### 1.1 DEFINITIONS

##### A. Products:

1. New items for incorporation in the Work whether purchased by Contractor or Owner for the Project, or taken from previously purchased stock and may also include existing materials or components required for reuse.
2. Includes the terms material, equipment, machinery, components, subsystem, system, hardware, software, and terms of similar intent and is not intended to change meaning of such other terms used in Contract Documents, as those terms are self-explanatory and have well recognized meanings in construction industry.
3. Items identified by Manufacturer's product name, including make or model designation, indicated in Manufacturer's published product literature, that is current as of the date of the Contract Documents.

#### 1.2 DESIGN REQUIREMENTS

- A. Where Contractor design is specified, design of installation, systems, equipment, and components, including supports and anchorage, shall be in accordance with provisions of latest edition of International Building Code (IBC) by International Code Council.

#### 1.3 ENVIRONMENTAL REQUIREMENTS

- A. Altitude: Provide materials and equipment suitable for installation and operation under rated conditions at elevations shown on Drawings.
- B. Provide equipment and devices installed outdoors or in unheated enclosures capable of continuous operation within an ambient temperature range of 0 °F to 104 °F.

#### 1.4 PREPARATION FOR SHIPMENT

- A. When practical, have the factory assemble products, mark or tag separate parts and assemblies to facilitate field assembly. Cover machined and unpainted parts that may be damaged by the elements with strippable protective coating.
- B. Package products to facilitate handling and protect from damage during shipping, handling, and storage. Mark or tag outside of each package or crate to indicate its purchase order number, bill of lading number, contents by name, name of Project and Contractor, equipment number, and approximate weight. Include complete packing list and bill of materials with each shipment.
- C. Extra Materials, Special Tools, Test Equipment, and Expendables:
1. Furnish as Required by Individual Specifications.
  2. Schedule:
    - a. Ensure that shipment and delivery occur concurrently with shipment of associated equipment.
    - b. Transfer to Owner shall occur immediately subsequent to Contractor's acceptance of equipment from Supplier.
  3. Packaging and Shipment:

- a. Package and ship extra materials and special tools to avoid damage during long term storage in original cartons insofar as possible, or in appropriately sized, hinged-cover, wood, plastic, or metal box.
  - b. Prominently Displayed on Each Package, the Following:
    - 1). Manufacturer's part nomenclature and number, consistent with Operation and Maintenance Manual identification system.
    - 2). Applicable equipment description.
    - 3). Quantity of parts in package.
    - 4). Equipment manufacturer.
  - 4. Deliver materials to the site.
  - 5. Notify Engineer upon arrival for transfer of materials.
  - 6. Replace extra materials and special tools found to be damaged or otherwise inoperable at time of transfer to Owner.
- D. Request a minimum 7-day advance notice of shipment from manufacturer. Upon receipt of Manufacturer's advance notice of shipment, promptly notify Engineer of anticipated date of equipment arrival.
  - E. Factory Test Results: Reviewed and accepted by Engineer before product shipment as required in individual Specification sections.

#### 1.5 DELIVERY AND INSPECTION

- A. Deliver products in accordance with accepted current Progress Schedule and coordinate to avoid conflict with the Work and conditions at Site. Deliver anchor bolts and templates sufficiently early to permit setting prior to placement of structural concrete.
- B. Deliver products in undamaged condition, in Manufacturer's original container or packaging, with identifying labels intact and legible. Include on label, date of manufacture and shelf life, where applicable.
- C. Unload products in accordance with Manufacturer's instructions for unloading or as specified, and record receipt of products at Site. Promptly inspect for completeness and evidence of damage during shipment.
- D. Remove damaged products from Site, and expedite delivery of identical new undamaged products, and remedy incomplete or lost products to provide that specified, so as not to delay progress of the Work.

#### 1.6 HANDLING, STORAGE, AND PROTECTION

- A. Handle and store products in accordance with Manufacturer's written instructions and in a manner to prevent damage. Store in approved storage yards or sheds provided in accordance with Section 01 50 00, TEMPORARY FACILITIES AND CONTROLS. Provide Manufacturer's recommended maintenance during storage, installation, and until products are accepted for use by Owner.
- B. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration. Keep running account of products in storage to facilitate

inspection and to estimate progress payments for products delivered, but not installed in the Work.

- C. Store electrical, instrumentation, and control products, and equipment with bearings in weather-tight structures maintained above 60 °F. Protect electrical, instrumentation, and control products, and insulation against moisture, water, and dust damage. Connect and operate continuously all space heaters furnished in electrical equipment.
- D. Store fabricated products above ground on blocking or skids, prevent soiling or staining, and store loose granular materials in well-drained area on solid surface to prevent mixing with foreign matter. Cover products that are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.
- E. Store finished products that are ready for installation in dry and well-ventilated areas. Do not subject to extreme changes in temperature or humidity.
- F. After installation, provide coverings to protect products from damage due to traffic and construction operations. Remove coverings when no longer needed.
- G. Hazardous Materials: Prevent contamination of personnel, storage building, and Site. Meet requirements of product specification, codes, and manufacturer's instructions.

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. Provide the Manufacturers standard materials suitable for service conditions unless otherwise specified in the individual Specifications.
- B. Where product specifications include a named Manufacturer, with or without model number, and also include performance requirements, named Manufacturer's products must meet the performance specifications.
- C. Like items of products furnished and installed in the Work shall be end products of one Manufacturer and of the same series or family of models to achieve standardization for appearance, operation and maintenance, spare parts and replacement, Manufacturer's services, and implement same or similar process instrumentation and control functions in same or similar manner.
- D. Do not use materials and equipment removed from existing premises, except as specifically permitted by Contract Documents.
- E. Provide interchangeable components of the same Manufacturer, for similar components, unless otherwise specified.
- F. Equipment, components, systems, sub-systems: Design and manufacture with due regard for health and safety of operation, maintenance, and accessibility, durability of parts, and shall comply with applicable OSHA, State, and local health and safety regulations.
- G. Regulatory Requirement: Coating materials shall meet Federal, State, and local requirements limiting the emission of volatile organic compounds and for worker exposure.

- H. **Safety Guards:** Provide for all belt or chain drives, fan blades, couplings, or other moving or rotary parts. Cover rotating part on all sides. Design for easy installation and removal. Use 16-gauge or heavier; galvanized steel, aluminum coated steel, or galvanized or aluminum coated ½" mesh expanded steel. Provide galvanized steel accessories and supports, including bolts. For outdoors application, prevent entrance of rain and dripping water.
- I. **Authority Having Jurisdiction (AHJ):**
  - 1. Materials and equipment manufactured within the scope of standards published by Underwriters Laboratories, Inc. shall conform to those standards and shall have an applied UL listing mark.
- J. **Equipment Finish:**
  - 1. Provide Manufacturer's standard finish and color, except where specific color is indicated.
  - 2. If Manufacturer has no standard color, provide equipment with gray finish as approved by Engineer.
- K. **Special Tools and Accessories:** Furnish to Owner, upon acceptance of equipment, all accessories required to place each item of equipment in full operation. These accessory items include, but are not limited to, adequate oil and grease (as required for first lubrication of equipment after field testing), light bulbs, fuses, hydrant wrenches, valve keys, hand wheels, chain operators, special tools, and other spare parts as required for maintenance.
- L. **Lubricant:** Provide initial lubricant recommended by equipment Manufacturer in sufficient quantity to fill lubricant reservoirs and to replace consumption during testing, startup, and operation until final acceptance by Owner.

## 2.2 FABRICATION AND MANUFACTURE

- A. **General:**
  - 1. Manufacture parts to U.S.A. standard sizes and gauges.
  - 2. Two or more items of the same type shall be identical, by the same Manufacturer, and interchangeable.
  - 3. Design structural members for anticipated shock and vibratory loads.
  - 4. Use 1/4" minimum thickness for steel that will be submerged, wholly or partially, during normal operation.
  - 5. Modify standard products as necessary to meet performance Specifications.
- B. **Lubrication System:**
  - 1. Require no more than weekly attention during continuous operation.
  - 2. Convenient and accessible. Oil drains with bronze or stainless steel valves and fill-plugs easily accessible from the normal operating area or platform.
  - 3. Locate drains to allow convenient collection of oil during oil changes without removing equipment from its installed position.
  - 4. Provide constant-level oilers or oil level indicators for oil lubrication systems.
  - 5. For grease type bearings, which are not easily accessible, provide and install stainless steel tubing; protect and extend tubing to convenient location with suitable grease fitting.

## 2.3 SOURCE QUALITY CONTROL

- A. Where Specifications call for factory testing to be witnessed by Engineer, notify Engineer not less than 14 days prior to scheduled test date, unless otherwise specified.
- B. Calibration Instruments: Bear the seal of a reputable laboratory certifying instrument has been calibrated within the previous 12 months to a standard endorsed by the National Institute of Standards and Technology (NIST).
- C. Factory Tests: Perform in accordance with accepted test procedures and document successful completion.

## PART 3 - EXECUTION

### 3.1 INSPECTION

- A. Inspect materials and equipment for signs of pitting, rust decay, or other deleterious effects of storage. Do not install material or equipment showing such effects. Remove damaged material or equipment from the Site and expedite delivery of identical new material or equipment. Delays to the Work resulting from material or equipment damage that necessitates procurement of new products will be considered delays within Contractor's control.

### 3.2 INSTALLATION

- A. Equipment Drawings show general locations of equipment, devices, and raceway, unless specifically dimensioned.
- B. No shimming between machined surfaces is allowed.
- C. Install the Work in accordance with NECA Standard of Installation, unless otherwise specified.
- D. Repaint painted surfaces that are damaged prior to equipment acceptance.
- E. Do not cut or notch any structural member or building surface without specific approval of Engineer.
- F. Handle, install, connect, clean, condition, and adjust products in accordance with Manufacturer's instructions, and as may be specified. Retain a copy of Manufacturers' instruction at Site, available for review at all times.
- G. For material and equipment specifically indicated or specified to be reused in the Work:
  - 1. Use special care in removal, handling, storage, and reinstallation to assure proper function in the completed Work.
  - 2. Arrange for transportation, storage, and handling of products that require offsite storage, restoration, or renovation. Include costs for such Work in the Contract Price.

### 3.3 ADJUSTMENT AND CLEANING

- A. Perform required adjustments, tests, operation checks, and other startup activities.

**3.4 LUBRICANTS**

- A. Fill lubricant reservoirs and replace consumption during testing, startup, and operation prior to acceptance of equipment by Owner.**

**END OF SECTION 01 60 00**

## SECTION 01 73 00 - EXECUTION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. General installation of products.
4. Coordination of Owner-installed products.
5. Progress cleaning.
6. Starting and adjusting.
7. Protection of installed construction.
8. Correction of the Work.

- B. Related Sections include the following:

1. Division 01 Section "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
2. Division 01 Section "Submittal Procedures" for submitting surveys.
3. Division 01 Section "Closeout Procedures" for submitting final Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

#### 1.3 SUBMITTALS

- A. Qualification Data: For land surveyor.
- B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

#### 1.4 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

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

**PART 3 - EXECUTION**

**3.1 EXAMINATION**

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

### 3.2 PREPARATION

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

### 3.3 CONSTRUCTION LAYOUT

- A. **Verification:** Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Owner or Owner's Representative promptly.
- B. **General:** Engage a land surveyor to lay out the Work using accepted surveying practices.
  - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
  - 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
  - 3. Inform installers of lines and levels to which they must comply.
  - 4. Check the location, level and plumb, of every major element as the Work progresses.
  - 5. Notify Owner or Owner's Representative when deviations from required lines and levels exceed allowable tolerances.
  - 6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. **Site Improvements:** Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. **Building Lines and Levels:** Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. **Record Log:** Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and

duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Owner or Owner's Representative.

### 3.4 FIELD ENGINEERING

- A. **Reference Points:** Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
1. Do not change or relocate existing benchmarks or control points without prior written approval of Owner or Owner's Representative. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Owner or Owner's Representative before proceeding.
  2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- B. **Benchmarks:** Establish and maintain a minimum of two (2) permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
  2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
  3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- C. **Certified Survey:** On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and site work.
- D. **Final Property Survey:** Prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.

### 3.5 INSTALLATION

- A. **General:** Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
  2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.

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

### 3.6 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction forces.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction forces.
  - 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
  - 2. Preinstallation Conferences: Include Owner's construction forces at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction forces if portions of the Work depend on Owner's construction.

### 3.7 PROGRESS CLEANING

- A. **General:** Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
  - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F (27 deg C).
  - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. **Site:** Maintain Project site free of waste materials and debris.
- C. **Work Areas:** Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Remove liquid spills promptly.
  - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. **Installed Work:** Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. **Concealed Spaces:** Remove debris from concealed spaces before enclosing the space.
- F. **Exposed Surfaces in Finished Areas:** Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. **Waste Disposal:** Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- H. **During handling and installation,** clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. **Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period.** Adjust and lubricate operable components to ensure operability without damaging effects.
- J. **Limiting Exposures:** Supervise construction operations to assure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### **3.8 STARTING AND ADJUSTING**

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.**
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.**
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.**
- D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 01 Section "Quality Requirements."**

### **3.9 PROTECTION OF INSTALLED CONSTRUCTION**

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.**
- B. Comply with manufacturer's written instructions for temperature and relative humidity.**

### **3.10 CORRECTION OF THE WORK**

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 01 Section "Cutting and Patching."**
  - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.**
- B. Restore permanent facilities used during construction to their specified condition.**
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.**
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.**
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.**

**END OF SECTION 01 73 00**

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## SECTION 01 74 00 – WARRANTIES AND BONDS

### GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes:

- 1. Warranties.
- 2. Bonds.

#### 1.3 SUBMITTAL REQUIREMENTS

- A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.

- B. Number of original signed copies required: Two (2) each.

- C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.

- 1. Product of work item.
- 2. Firm, with name of principal, address and telephone number.
- 3. Scope.
- 4. Date of beginning of warranty, bond or service and maintenance contract.
- 5. Duration of warranty, bond or service maintenance contract.
- 6. Provide information for Owner's personnel:

- a. Proper procedure in case of failure.
- b. Instances which might affect the validity or warranty or bond.

- 7. Contractor, name of responsible principal, address and telephone number.

#### 1.4 FORM OF SUBMITTALS

- A. Prepare in duplicate packets.

- B. Format:

- 1. Size 8-1/2 inches by 11 inches, punch sheets for standard three (3) ring binder.

- a. **Fold larger sheets to fit into binders.**
- 2. **Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS".**  
**List:**
  - a. **Title of Project.**
  - b. **Name of Contractor.**
- C. **Binders: Commercial quality, three (3) D-ring type binders with durable and cleanable white plastic covers and maximum D-ring width of two (2) inches. Binders shall be presentation type with clear vinyl covers on front, back, and spine. Binders shall include two sheet lifters and two horizontal inside pockets.**

#### **1.5 WARRANTY SUBMITTALS REQUIREMENTS**

- A. **For all major pieces of equipment, submit a warranty from the equipment manufacturer. The manufacturer's warranty period shall be concurrent with the Contractor's for one (1) year, unless otherwise specified, commencing at the time of final acceptance by the Owner.**
- B. **The Contractor shall be responsible for obtaining certificates for equipment warranty for all major equipment specified. The Owner reserves the right to request warranties for equipment not classified as major. The Contractor shall still warrant equipment not considered to be "major" in the Contractor's one-year warranty period even though certificates of warranty may not be required.**
- C. **In the event that the equipment manufacturer or supplier is unwilling to provide a one (1) year warranty commencing at the start of the Correction Period, the Contractor shall obtain from the manufacturer a two (2) year warranty commencing at the time of equipment delivery to the job site. This two (2) year warranty from the manufacturer shall not relieve the Contractor of the one (1) year warranty, starting at the time of Owner's acceptance of the equipment.**
- D. **The Owner shall incur no labor or equipment cost during the guarantee period.**
- E. **Guarantee shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate equipment design, improper assembly or erection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the manufacturer or the Contractor.**

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**END OF SECTION 01 74 00**

## SECTION 01 77 00 – CLOSEOUT PROCEDURES

### PART 1 - GENERAL

#### 1.1 GENERAL

##### A. Informational Submittals:

1. **Submit Prior to Application for Final Payment.**
  - a. **Record Documents:** As required in Division 00 - General Conditions, City of Huntsville Supplement to General Requirements for Construction of Public Improvements.
  - b. **Approved Shop Drawings and Samples:** As required in the General Conditions.
  - c. **Certificates of Testing and Inspection:** As required in the General Conditions, these General Requirements sections, and the individual Specifications sections.
  - d. **Training Sessions.**
  - e. **Certificate of Substantial Completion.**
  - f. **Special bonds, Special Guarantees, and Service Agreements.**
2. **Form of Submittal:**
  - a. **Bind in commercial quality 8-1/2" by 11" three ring, side binders with hardback, cleanable, plastic covers.**
    - 1). **Label cover of each binder with typed or printed title Warranties and Bonds, with title of Project; name; address, and telephone number of Contractor and equipment Supplier, and name of responsible principal.**
    - 2). **Table of Contents: Neatly typed, in the sequence of the of the Project Manual, with each item identified with the number and title of the Specification section in which specified, and the name of the product or Work item.**
    - 3). **Separate each warranty or Bond with index tab sheets keyed to the Table of Contents. Provide full information, using separate typed sheets as necessary. List Subcontractor, Supplier, and Manufacturer, with name, address, and telephone number of responsible contact for service and warranty issues.**
3. **Preparation of Submittal:**
  - a. **Obtain notarized warranties and Bonds, executed in duplicate by responsible Subcontractor, Supplier, and Manufacturer, within 10 days after completion of the applicable item or Work, except for items put into use with Owner's permission, leave date of beginning of time warranty until date of Substantial Completion is determined.**
4. **Time of Submission: Submit within 10 days after the date of Date of Substantial Completion and prior to submission of Final Application of Payment.**
  - a. **Spare parts and special tools as required by individual Specification sections.**
  - b. **Consent of Surety to Final Payment: As required in General Conditions.**
  - c. **Releases or Waivers of Liens and Claims: As required in General Conditions.**
  - d. **Releases from Agreements.**
  - e. **Final Application for Payment: Submit in accordance with procedures and requirements stated in Division 00 - General Conditions, City of Huntsville Supplement to General Requirements for Construction of Public Improvements.**
  - f. **Extra Materials: As required by individual Specification sections.**

#### 1.2 RECORD DOCUMENTS

##### A. Quality Assurance:

1. Furnish a qualified and experienced person, whose duty and responsibility shall be to maintain record documents.
2. Record Drawings shall be completed per the directives in Division 00 - General Conditions, City of Huntsville Supplement to General Requirements for Construction of Public Improvements.
3. Accuracy of Records:
4. Coordinate changes within record documents, making legible and accurate entries on each sheet of Drawings and other documents where such entry is required to show change.
5. Purpose of Project record documents is to document factual information regarding aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive Site measurement, investigation, and examination.
6. Make entries within 24 hours after receipt of information that a change in the Work has occurred.
7. Prior to submitting each request for progress payment, request Engineer's review and approval of current status of record documents. Failure to properly maintain, update, and submit record documents may result in a deferral by Engineer to recommend whole or any part of Contractor's Application for Payment, either partial or final.

### 1.3 RELEASES FROM AGREEMENTS

- A. Furnish Owner, written releases from property owners or public agencies where side agreements or special easements have been made, or where Contractor's operations have not been kept within the Owner's construction right-of-way.
- B. In the Event Contractor is Unable to Secure Written Releases:
  1. Inform Owner of the reasons.
  2. Owner or its representatives will examine the Site, and Owner will direct Contractor to complete the Work that may be necessary to satisfy terms of the side agreement or special easement.
  3. Should Contractor refuse to perform this Work, Owner reserves right to have it done by separate contract and deduct cost of same from Contract Price, or require Contractor to furnish a satisfactory bond in a sum to cover legal Claims for damages.
  4. When Owner is satisfied that the Work has been completed in agreement with Contract Documents and terms of side agreement or special easement, right is reserved to waive requirement for written release if:
  5. Contractor's failure to obtain such statement is due to grantor's refusal to sign, and this refusal is not based upon any legitimate Claims that Contractor has failed to fulfill terms of side agreement or special easement, or
  6. Contractor is unable to contact or has had undue hardship in contacting grantor.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.1 MAINTENANCE OF RECORD DOCUMENTS

- A. General:
  1. Promptly following commencement of Contract Times, secure from Engineer at no cost to Contractor, one complete set of Contract Documents. Drawings will be full size.

2. Label or stamp each record document with title, "RECORD DOCUMENTS," in neat large printed letters.
  3. Record information concurrently with construction progress and within 24 hours after receipt of information that change has occurred. Do not cover or conceal Work until required information is recorded.
- B. Preservation:
1. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
  2. Make documents and Samples available at all times for observation by Engineer.
- C. Making Entries on Drawings:
1. **Guidelines for making entries on Record Drawings are listed below. The final set of Record Drawings shall be per the instructions in Division 00 - General Conditions, City of Huntsville Supplement to General Requirements for Construction of Public Improvements.**
  2. Use an erasable colored pencil (not ink or indelible pencil), clearly describe change by graphic line and note as required.
    - a. Color Coding:
      - 1). Green when showing information deleted from Drawings.
      - 2). Red when showing information added to Drawings.
      - 3). Blue and circled in blue to show notes.
  3. Date entries.
  4. Call attention to entry by "cloud" drawn around area or areas affected.
  5. Legibly mark to record actual changes made during construction, including, but not limited to:
  6. Depths of various elements of foundation in relation to finished first floor data if not shown or where depth differs from that shown.
  7. Horizontal and vertical locations of existing and new Underground Facilities and appurtenances, and other underground structures, equipment, or Work, and Reference to at least two measurements to permanent surface improvements.
  8. Location of internal utilities and appurtenances concealed in the construction referenced to visible and accessible features of the structure.
  9. Locate existing facilities, piping, equipment, and items critical to the interface between existing physical conditions or construction and new construction.
  10. Changes made by Addenda and Field Orders, Work Change Directive, Change Order, and Engineer's written interpretation and clarification using consistent symbols for each and showing appropriate document tracking number.
  11. Dimensions on Schematic Layouts: Show on record drawings, by dimension, the centerline of each run of items that are described in previous subparagraph above.
  12. Clearly identify the item by accurate note such as "cast iron drain," "galv. water," and the like.
  13. Show, by symbol or note, vertical location of item ("under slab," "in ceiling plenum," "exposed," and the like).
  14. Make identification so descriptive that it may be related reliably to Specifications.

### 3.2 FINAL CLEANING

- A. At completion of the Work or of a part thereof and immediately prior to Contractor's request for certificate of Substantial Completion; or if no certificate is issued, immediately prior to Contractor's notice of completion, clean entire Site or parts thereof, as applicable.

1. Leave the Work and adjacent areas affected in a cleaned condition satisfactory to Owner.
2. Remove grease, dirt, dust, paint or plaster splatter, stains, labels, fingerprints, and other foreign materials from exposed surfaces.
3. Repair, patch, and touch up marred surfaces to specified finish and match adjacent surfaces.
4. Clean all windows.
5. Clean and wax wood, vinyl, or painted floors.
6. Broom clean exterior paved driveways and parking areas.
7. Hose clean sidewalks, loading areas, and others contiguous with principal structures.
8. Rake and clean all other surfaces.
9. Remove snow and ice from access to buildings.
10. Replace air-handling filters and clean ducts, blowers, and coils of ventilation units operated during construction.
11. Leave water courses, gutters, and ditches open and clean.

B. Use only cleaning materials recommended by Manufacturer of surfaces to be cleaned.

END OF SECTION 01 77 00

## SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
  1. Footings.
  2. Foundation walls.
  3. Slabs-on-grade.
  4. Suspended slabs.
  5. Concrete toppings.
  6. Building frame members.
  7. Building walls.
  8. Hydraulic (liquid containing) structures.
- B. Related Sections:

#### 1.3 DEFINITIONS

- A. **Cementitious Materials:** Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.
- B. **Exposed Concrete:** Concrete surface that can be seen inside or outside of structures regardless whether concrete is above water, dry at all times, or can be seen when structure is drained.
- C. **Hydraulic Structures:** Liquid containing basins.
- D. **Defective Areas:** Surface defects that include honeycomb, rock pockets, indentations greater than 3/16", cracks 0.005" wide and larger as well as any crack that leaks for liquids containing basins and below grade habitable spaces; cracks 0.010" wide and larger in non-fluid holding structures, spalls, chips, air bubbles greater than 3/4" in diameter, pinholes, bug holes, embedded debris, lift lines, sand lines, bleed lines, leakage from form joints, fins and other projections, form pop-outs, texture irregularities, and stains and other color variations that cannot be removed by cleaning.

#### 1.4 SUBMITTALS

- A. **Product Data:** For each type of product indicated.
- B. **Design Mixtures:** For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.
  2. Submit Shrinkage Test Results for design mixtures. See 2.15 CONCRETE MIXTURES FOR HYDRAULIC ELEMENTS for mix requirements. See 3.18 FIELD QUALITY CONTROL-D. Shrink Tests -3 for shrinkage test requirements and limitations. Any Mix Design submitted without a Shrink Test will not be reviewed and will be returned to the Contractor as "Rejected".
- C. **Steel Reinforcement Shop Drawings:** Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
1. Fabrication: Reinforcement shall not be fabricated until the shop drawings have been processed, approved and returned.
  2. Check all shop drawings to verify reinforcement dimensions required by drawings are satisfied.
  3. Certify material and type of deformation.
- D. **Formwork Shop Drawings:** Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork. All formwork erection, shoring and removal is the responsibility of the Contractor and/or the qualified professional engineer the contractor used for the formwork drawings.
1. Shoring and Re-shoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and installing and removing re-shoring.
- E. **Samples:** For waterstops, vapor retarder, expansion joint material, handrail and pressure relief valves if different than specified..
- F. **Welding certificates.**
- G. **Qualification Data:** For manufacturer testing agency.
- H. **Material Test Reports:** for the following, from a qualified testing agency, indicating compliance with requirements:
1. **Aggregates.** Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
- I. **Material Certificates:** For each of the following, signed by manufacturers:
1. Cementitious materials.
  2. Admixtures.
  3. Form materials and form-release agents.
  4. Steel reinforcement and accessories.
  5. Waterstops.
  6. Curing compounds.
  7. Floor and slab treatments.
  8. Bonding agents.
  9. Adhesives.
  10. Vapor retarders.
  11. Semi-rigid joint filler.
  12. Joint-filler strips.
  13. Repair materials.

- J. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
- K. Field quality-control test and inspection reports.
- L. Minutes of pre-installation conference.
- M. Course Aggregate Gradation.
- N. Fine Aggregate Gradation.
- O. One copy of each 30 consecutive strength test results and mix design used from a record of past performance or one copy of the laboratory trial mix design and results and one copy of the mix design proposed for each mixture and use under this contract.
- P. Material Test Reports: for the following, from a qualified testing agency indicating compliance with requirements:
  - 1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
- Q. Ready-Mix concrete.
  - 1. Provide delivery tickets for ready-mix concrete or weigh-masters certificate per ASTM C94 including weights of cement and each size aggregate and amount of water added at the plant and record of pours. Record the amount of water added on the job on the delivery ticket. Water added at the plant shall account for moisture in both coarse and fine aggregate. If water is added on the job the total water content shall not exceed the water content of the approved design mix.
  - 2. Keep record showing time and place of each pour (placement) of concrete, together with transit-mix delivery slips certifying the contents of the pour (placement).
  - 3. Furnish records to Engineer upon request.

## 1.5 QUALITY ASSURANCE

- A. **Installer Qualifications:** A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. **Manufacturer Qualifications:** A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
  - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
  - 2. The criteria hereinafter set out are solely for the purpose of establishing required mixture proportions and do not constitute a basis for confirming the adequacy of concrete strength.
    - a. Required Average Strength Above specified Compressive Strength: Proportions, including water-cement ratio, shall be established on the basis either of laboratory trial batches or of field experience with the materials to be employed. The proportions shall be selected to produce an average strength of 28 days exceeding

the specified compressive strength by the amount indicated below, when both air content and slump are the maximums permitted by the Specifications.

- b. Determination of the required average strength shall be in accordance with ACI 318 "building Code Requirements for Reinforced Concrete," except that if suitable data from trial batches or field experience cannot be obtained, permission will not be granted to base concrete proportions on the water-cement ratio limits set out in the above referenced code.
- 1) Past Plant Performance: Proportions may be established on the actual field performance of the ready-mix producer. Where the concrete production facility has a record, based on at least 30 consecutive strength tests representing similar materials and conditions to those expected, the strength used as the basis for selecting proportions shall exceed the required  $f'c$  by at least:
    - a) 400 psi if the standard deviation is less than 300 psi;
    - b) 500 psi if the standard deviation is 300 to 400 psi;
    - c) 700 psi if the standard deviation is 400 to 500 psi;
    - d) 900 psi if the standard deviation is 500 to 600 psi;
    - e) 1,200 psi if the standard deviation is above 600 psi or unknown.
  - 2) Strength data for determining standard deviation shall be considered to comply with the foregoing stipulations if they represent either a group of at least 30 consecutive tests or the statistical average of two groups totaling 30 or more tests. The tests used to establish standard deviation shall represent concrete produced to meet a specified strength or strengths within 1,000 psi of that specified for the proposed work. Changes in materials and proportions within the population of background tests shall not have been more closely restricted than they will be for the proposed work.
  - 3) Strength data for determining standard deviation shall be considered to comply with the foregoing stipulations if they represent either a group of at least 30 consecutive tests or the statistical average of two groups totaling 30 or more tests. The tests used to establish standard deviation shall represent concrete produced to meet a specified strength or strengths within 1,000 psi of that specified for the proposed work. Changes in materials and proportions within the population of background tests shall not have been more closely restricted than they will be for the proposed work.
  - 4) Laboratory Trial Batches: When the ready-mix producer does not have a record of past performance, the combination of materials and the proportions selected shall be determined from trial mixes having proportions and consistencies suitable for the work based on ACI 211.1-77.
    - a) When laboratory trial batches are used as the basis for selecting concrete proportions, strength tests shall be made in accordance with "Method of Test for Compressive Strength of Molded Concrete Cylinders" (ASTM C39) on specimens prepared in accordance with "Method of Making and Curing Test Specimens in the Laboratory" (ASTM C192). A curve shall be established showing the relationship between water-cement ratio (or cement content) and compressive strength. The curve shall be based on at least three points representing batches which produce strengths above and below that required. Each point shall represent the average of at least three specimens tested at 28 days or the earlier age designation.
    - b) The average strength required shall exceed the specified compressive strength by 1,200 psi.

- c) The maximum permissible water-cement ratio (or minimum cement content) for the concrete to be used in the structure shall be that shown by the curve to produce the average strength indicated, but in no case shall the water-cement ratio exceed 0.42 by weight.
- C. **Testing Agency Qualifications:** An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
  - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
  - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.
- D. **Source Limitations:** Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- E. **Welding Qualifications:** Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."
- F. **ACI Publications:** Comply with the following unless modified by requirements in the Contract Documents:
  - 1. ACI 301, "Specifications for Structural Concrete."
  - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
  - 3. ACI 350 "Code Requirements for Environmental Engineering Concrete Structures."
  - 4. ACI 318 "Building Code Requirements for Reinforced Concrete."
- G. **Concrete Testing Service:** Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
- H. **Preinstallation Conference:** Conduct conference at Project site.
  - 1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
    - a. Contractor's superintendent.
    - b. Independent testing agency responsible for concrete design mixtures.
    - c. Ready-mix concrete manufacturer.
    - d. Concrete subcontractor.
  - 2. Review special inspection and testing and inspecting agency procedure for field quality control., concrete finishes and finishing, cold and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints and joint-filler strips, semirigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures and concrete protection.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. **Steel Reinforcement:** Deliver, store, and handle steel reinforcement to prevent bending and damage.

1. Store reinforcement in a neat manner, bundled, tagged and a minimum 4" off the ground.
  2. All damaged or improperly fabricated bars shall be replaced at no added expense to the project.
  3. All reinforcement shall be free from rust, loose mill scale and other contaminants.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants. Do not store directly on ground.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

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

### **2.2 FORM-FACING MATERIALS**

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints. Furnish on exposed surfaces and interior surfaces.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit. Permitted to furnish on below grade exterior surfaces
- C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- D. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.
- E. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- F. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- G. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- H. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

## 2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 deformed.
- B. Plain-Steel Welded Wire Reinforcement: ASTM A 185 plain, fabricated from as-drawn steel wire into flat sheets.
- C. Deformed-Steel Welded Wire Reinforcement: ASTM A 497/A 497M, flat sheet.

## 2.4 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
  - 1. All dowels shall be placed and securely anchored before placing concrete. All dowels shall be parallel with each other and perpendicular to the joint.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
  - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
  - 2. Secure all reinforcement in place using steel chairs, supports, "A" bars and any other ACI approved product. Supports shall be spaced adequately to support the steel firmly in place.
  - 3. Chairs will not be accepted to hold reinforcing clearance on walls.
- C. General:
  - 1. Accessories shall be subject to Engineer's approval.
  - 2. Tie wire- 18 gauge steel wire. Ends of wire shall be bent towards the interior part of the wall.
  - 3. Support above forms with fabricated steel chairs. Number of chairs shall be adequate to prevent sag during steel and concrete placement.
  - 4. Wall layer spacers shall be 1/4" ROUND "Z" BAR.
  - 5. Horizontal layer spacers shall be stand.
  - 6. Dowel Bar Splicer:
    - a. Dowel bar splicer shall be Richmond or approved equal, manufactured from standard specified rebar material with NC threads and shop fabricated to specified dowel configurations.

## 2.5 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
  - 1. Portland Cement (Nonhydraulic Above Grade Structures): ASTM C 150, Type I or II, or combination of Type I with fly ash.
  - 2. Portland Cement (Hydraulic and Below Grade Structures): ASTM C 150 type II or combination of Type I with fly ash.

FLY ASH: ASTM C 618, Class F FLY ASH SHALL NOT EXCEED 15 PERCENT.

- B. **Norman-Weight Aggregates:** ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
  - 1. **Maximum Coarse-Aggregate Size:** 1 ½" nominal.
  - 2. **Fine Aggregate:** Free of materials with deleterious reactivity to alkali in cement.
- C. **Water:** ASTM C 94 and potable.

## 2.6 ADMIXTURES

- A. **Air-Entraining Admixture:** ASTM C 260.
- B. **Chemical Admixtures:** Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
  - 1. **Water-Reducing Admixture:** ASTM C 494/C 494M, Type A.
  - 2. **Retarding Admixture:** ASTM C 494/C 494M, Type B.
  - 3. **Water-Reducing and Retarding Admixture:** ASTM C 494/C 494M, Type D.
  - 4. **High-Range, Water-Reducing Admixture:** ASTM C 494/C 494M, Type F.
  - 5. **High-Range, Water-Reducing and Retarding Admixture:** ASTM C 494/C 494M, Type G.
    - a. Bayer Corporation.
    - b. ChemMasters.
    - c. Conspec Marketing & Manufacturing Co., Inc.; a Dayton Superior Company.
    - d. Davis Colors.
    - e. Elementis Pigments, Inc.

## 2.7 WATERSTOPS

- A. **General:** Provide flexible rubber water stops or flexible PVC water stops unless otherwise noted.
- B. **Flexible Rubber Waterstops:** CE CRD-C 513, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
  - 1. **Manufacturers**
    - a. Greenstreak.
    - b. Progress Unlimited, Inc.
    - c. Williams Products, Inc.
  - 2. **Profile:**
  - 3. **Dimensions:** 4 inches by 3/16 inch thick or 6 inches by 3/8 inch thick nontapered as noted on drawings
- C. **Chemically Resistant Flexible Waterstops:** Thermoplastic elastomer rubber waterstops for embedding in concrete to prevent passage of fluids through joints; resistant to oils, solvents, and chemicals. Factory fabricate corners, intersections, and directional changes.
  - 1. **Products:**
    - a. JP Specialties, Inc.; Earth Shield TPE-Rubber.
    - b. Vinylex Corp.; PetroStop.

- c. WESTEC Barrier Technologies, Inc.; 600 Series TPE-R.
    - 2. Profile:
    - 3. Dimensions: 4 inches by 3/16 inch thick or 6 inches by 3/16 inch thick nontapered as indicated on Drawings.
  - D. Flexible PVC Waterstops: CE CRD-C 572, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
    - 1. Manufacturers:
      - a. BoMetals, Inc.
      - b. Greenstreak.
      - c. Meadows, W. R., Inc.
      - d. Murphy, Paul Plastics Co.
      - e. Progress Unlimited, Inc.
      - f. Tamms Industries, Inc.
      - g. Vinylex Corp.
    - 2. Profile: Ribbed with center bulb or as indicated.
    - 3. Dimensions: 4 inches by 3/16 inch thick or 6 inches by 3/8 inch thick, nontapered.
  - E. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch.
    - 1. Products:
      - a. Colloid Environmental Technologies Company; Volclay Waterstop-RX.
      - b. Concrete Sealants Inc.; Conseal CS-231.
      - c. Greenstreak; Swellstop.
      - d. Henry Company, Sealants Division; Hydro-Flex.
      - e. JP Specialties, Inc.; Earth Shield Type 20.
      - f. Progress Unlimited, Inc.; Superstop.
      - g. TCMiraDRI; Mirastop.
  - F. Self-Expanding Rubber Strip Waterstops: Manufactured rectangular or trapezoidal strip, bentonite-free hydrophilic polymer modified chloroprene rubber, for adhesive bonding to concrete, 3/8 by 3/4 inch.
    - 1. Products:
      - a. Deneef construction Chemicals; Swellseal.
      - b. Greenstreak; Hydrotite.
      - c. Mitsubishi International Corporation; Adeka Ultra Seal.
      - d. Progress Unlimited, Inc.; Superstop.
- 2.8 VAPOR RETARDERS**
- A. Plastic Vapor Retarder: ASTM E 1745, Class B. Include manufacturer's recommended adhesive or pressure-sensitive tape.
    - 1. Products:
      - a. Fortifiber Corporation: Moistop Ultra.
      - b. Revan Industries Inc.; Vapor Block 10.
      - c. Stego Industries, LLC; Stego Wrap, 15 mils.
  - B. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

## 2.9 FLOOR AND SLAB TREATMENTS

- A. Not applicable to this project.

## 2.10 LIQUID FLOOR TREATMENTS

- A. **Penetrating Liquid Floor Treatment:** Clear, chemically reactive, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.
  - 1. **Products:**
    - a. Burke by Edoco; Titan Hard.
    - b. ChemMasters; Chemisil Plus.
    - c. ChemTec international; ChemTec One.
    - d. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior company; Intraseal.
    - e. Curecrete Distribution Inc.; Ashford Formula.
    - f. Dayton superior corporation; Day-Chem sure Hard.
    - g. Euclid Chemical company (The); Euco Diamond Hard.
    - h. Kaufman Products, Inc.; SureHard.
    - i. L&M Construction Chemicals, Inc.; Seal Hard.
    - j. Meadows, W. R., Inc.; Liqui-Hard.
    - k. Metalcrete Industries; Floorsaver.
    - l. Nox-Crete Products Group, Kinsman corporation; Duranox.
    - m. Symons Corporation, a Dayton Superior Company buff Hard.
    - n. US Mix Products Company; US Spec Industraseal.
    - o. Vexcon Chemicals, Inc.; Vexcon StarSeal PS.

## 2.11 CURING MATERIALS

- A. **Evaporation Retarder:** Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
  - 1. **Products:**
    - a. Axim Concrete Technologies; Cimfilm.
    - b. Burke by Edoco; BurkeFilm.
    - c. ChemMasters; Spray-Film.
    - d. Conspec Marketing & manufacturing Co., Inc., a Dayton Superior company; Aquafilm.
    - e. Dayton Superior corporation; Sure Film.
    - f. Euclid Chemical Company (The); Eucobar.
    - g. Kaufman Products, Inc.; Vapor Aid.
    - h. Lambert coporation; Lambco Skin.
    - i. L&M Construction Chemicals, Inc.; E-Con.
    - j. MBT Protection and Repair, Div., of ChemRex; confilm.
    - k. Meadows, W. R., Inc; Sealtight Evapre.
    - l. Metalcrete Industries; Waterhold.
    - m. Nox-Crete Products Group, Kinsman corporation; Monofilm.
    - n. Sika Corporation, Inc.; SikaFilm.
    - o. Symons Corporation, a Dayton Superior Company; Finishing Aid.
    - p. Unitex; Pro-Film.
    - q. US Mix Products Company; US Spec Monofilm ER.

- r. Vexcon Chemicals, Inc.; Certi-Vex EnvioAssist..
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
- 1. Products
    - a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
    - b. Burke by Edoco; Aqua Resin cure.
    - c. ChemMasters; Safe-Cure Clear.
    - d. Conspec Marketing & Manufacturing co., Inc., a Dayton superior company; W.B. Resin cure.
    - e. Dayton Superior corporation; Day Chem Rez cure (J-11-W).
    - f. Euclid Chemical Company (The); Kurez DR VOX.
    - g. Kaufman Products, Inc.; Thinfilm 420.
    - h. Lambert Corporation; Aqua Kure-Clear.
    - i. L&M Construction Chemicals, Inc.; L&M Cure R.
    - j. Meadows, W. R., Inc.; 100 Clear.
    - k. Nox-Crete Products Group, Kinsman Corporation; Resom Cure E/
    - l. Sykkmons Corporation, a Dayton Superior Company; Resi-Chem Clear Cure.
    - m. Tamms Industries, Inc., Horncure WB 30.
    - n. Unitex; Hydro cure 309.
    - o. US Mix Products Company; US Spec Maxcure Resin Clear.
    - p. Vexcon Chemicals, Inc.; Certi-Vex Enviocure 100.
- F. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A. Compatible with penetrating liquid floor treatment for surfaces specified to receive penetrating liquid floor treatment.
- 1. Products:
    - a. Burke by Edoco; cureseal 1315 WB.
    - b. ChemMasters; Polyseal WB.
    - c. Conspec Marketing & manufacturing co., Inc., a Dayton Superior Company; Sealcure 1315 WB
    - d. Euclid Chemical company (The); super Diamond Clear VOX.
    - e. Kaufman Products, Inc.; Sure Cure 25 Emulsion.
    - f. Lambert corporation; UV Safe Seal.
    - g. L&M construction Chemicals, Inc.; Lumiseal WB Plus.
    - h. Meadows, W. R., Inc.; Vocomp-30.
    - i. Metalcrete Industries; Metcure 30.
    - j. Symons Corporation, a Dayton superior company; Cure 7 Seal 31 Percent E.
    - k. Tamms Industries, Inc.; LusterSeal WB 300.
    - l. Unitex; Hydro Seal 25.
    - m. US Mix Products Company; US Spec Radiance UV-25.
    - n. Vexcon Chemicals, Inc.; Vexcon Starseal 1315.

## 2.12 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 per ASTM D 2240.
- C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
  - 1. Types IV and V, load bearing for bonding hardened or freshly mixed concrete to hardened concrete.

## 2.13 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
  - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage by weight of cementitious materials other than Portland cement in concrete as follows:
  - 1. Fly Ash: 15 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement for non-hydraulic structures and 0.10 percent by weight of cement for hydraulic structures.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
  - 1. Use water-reducing or high-range water-reducing admixture in concrete, as required, for placement and workability.
  - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
  - 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

## 2.14 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings, Equipment Supports, Miscellaneous Concrete: Proportion normal-weight concrete mixture as follows:
  - 1. Minimum Compressive Strength: 4000 psi at 28 days.
  - 2. Maximum Water-Cementitious Materials Ratio: 0.45.
  - 3. Minimum cementitious materials content: 564 lb/cy
  - 4. Slump Limit: 8 inches maximum for concrete with verified slump of 2 to 4 inches (50 to 100 mm) before adding high range water-reducing admixture or plasticizing admixture per ACI 301.

5. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
- B. Foundation Walls: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 4000 psi at 28 days.
  2. Maximum Water-Cementitious Materials Ratio: .45.
  3. Minimum Cementitious Materials content: 564 LB/CUYD.
  4. Slump Limit: 8 inches max for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture per ACI 301.
  5. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
- C. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 4000 psi at 28 days.
  2. Maximum Water-Cementitious Materials Ratio: 0.45 by weight.
  3. 564 lb/cuyd.
  4. Slump Limit: 4 inches plus ½" or minus 2".
  5. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch (38-mm) nominal maximum aggregate size.
  6. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.
- D. Suspended Slabs: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 4000 psi at 28 days.
  2. Minimum Cementitious Materials Content: 540 lb/cu.yd.
  3. Slump Limit: 4 inches plus 1/2" or minus 2".
  4. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
  5. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.
- E. Building Walls: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 4000 psi at 28 days.
  2. Maximum Water-Cementitious Materials Ratio: 0.45.
  3. Minimum Cementitious Materials Content: 564 lb/cu yd.
  4. Slump Limit: 8 inches Max for concrete with verified slump of 2 to 4 inches before adding high range water-reducing admixture or plasticizing admixture per ACI 301.
  5. Air Content: 5.5 percent , plus or minus 1.5 percent at point of delivery for 1 1/2 inch (38-mm) nominal maximum aggregate size.
- F. MASONRY GROUT: Pea Gravel Concrete with 3000 psi minimum compressive strength at 28 days and a maximum water/cement ratio = .50.

## 2.15 CONCRETE MIXURES FOR HYUDRAULIC ELEMENTS

- A. Proportional normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 4500 psi at 28 days.
  2. Maximum Water-Cementitious Materials Ratio: 0.42.
  3. Slump Limit: 8 inch for concrete with verified slump of 2" to 4: before adding high-range water-reducing admixture or plasticizing admixture per ACI 301.
  4. Air content: 5 ½%, ±1.5% at point of delivery for 1 ½" nominal maximum aggregate size.
  5. Minimum Cementitious Materials Content: 564 lb/CU YD.

6. Shrinkage Limit: 0.036% as measured at 21-day drying age or 0.042% as measured at 28-day drying age.

## 2.16 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."
- B. Bending: All bending shall be by using bending jigs and mandrels. All bars shall be bent cold.
- C. Cutting: Bars shall be cut by cold shearing. Torch cutting in the field may be permitted in special situations.
- D. Openings and obstructions:
  1. Place additional reinforcement at all opening as indicated or detailed.
  2. Shop bend reinforcing around obstructions. Engineer's approval is required before cutting steel.
  3. Consult Engineer on special situations.

## 2.17 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116, and furnish batch ticket information.
  1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
  1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
  2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.
  3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

## PART 3 - EXECUTION

### 3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
  1. Class A, 1/8 inch for smooth-formed finished surfaces.
  2. Class B, 1/4 inch for rough-formed finished surfaces.

- D. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
  - 1. Install keyways, reglets, recesses, and the like, for easy removal.
  - 2. Do not use rust-stained steel form-facing material.
- E. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- F. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- G. Chamfer exterior corners and edges of permanently exposed concrete.
- H. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- I. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- J. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- K. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

### 3.2 EMBEDDED ITEMS

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

### 3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.
  - 1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.

2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

### 3.4 SHORES AND RESHORES

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

### 3.5 VAPOR RETARDERS

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
  1. Lap joints 6 inches and seal with manufacturer's recommended tape.

### 3.6 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
  1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
  1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.
- F. Other trades: Coordinate all work of other trades to avoid conflict with reinforcement.
- G. Shop drawings: Check all shop drawings to verify dimensions required.
- H. Clearance:

1. Preserve clearance between bars of 1 inch minimum, not less than one bar diameter or 1/3 times large aggregate, whichever is larger.
2. Provide following concrete coverage over reinforcing steel in accordance with the latest edition of ACI 318 and ACI 350 unless otherwise indicated on plans.
3. Lap all reinforcing bars as required by ACI 318 Latest Edition Class B lap except where otherwise shown or required by ACI.
4. Stagger splices except where otherwise shown.
5. Lap welded wire two spaces.

### 3.7 JOINTS

- A. **General:** Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. **Construction Joints:** Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Engineer/Owner
  1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
  2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
  3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
  4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
  5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
  6. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. **Contraction Joints in Slabs-on-Grade:** Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one fourth of concrete thickness as follows:
  1. **Grooved Joints:** Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
  2. **Sawed Joints:** Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. **Isolation Joints in Slabs-on-Grade:** After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
  1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
  2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealants," are indicated.
  3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

- E. **Doweled Joints:** Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

### 3.8 WATERSTOPS

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

### 3.9 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
  - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
  - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
  - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
  - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
  - 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  - 2. Maintain reinforcement in position on chairs during concrete placement.
  - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
  - 4. Slope surfaces uniformly to drains where required.
  - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

- F. **Cold-Weather Placement:** Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
  2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- G. **Hot-Weather Placement:** Comply with ACI 301 and as follows:
1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
  2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

### 3.10 CONCRETE WALL FINISHES

- A. **Type W-1 (Ordinary Wall Finish or Coating):**
1. Patch tie holes.
  2. Knock off projections.
  3. Patch defective areas.
- B. **Type W-2 (Smooth Wall Finish):**
1. Patch tie holes.
  2. Grind off projections, fins, and rough spots.
  3. Patch defective areas and repair rough spots resulting from form release agent failure or other reasons to provide smooth uniform appearance.
- C. **Type W-5 (Finish for Painting):**
1. Patch tie holes.
  2. Grind off projections, fins, and rough spots.
  3. Patch and repair defective areas as specified for Type W-2.

### 3.11 CONCRETE SLAB FINISHES

- A. **General:**
1. Finish slab concrete per the requirements of ACI 302.1R
  2. Use manual screeds, vibrating screeds, or roller compacting screeds to place concrete level and smooth.
  3. Do not use "Jitterbugs" or other special tools designed for the purpose of forcing coarse aggregate away from the surface and allowing a layer of mortar, which will be weak and cause surface cracks or delamination, to accumulate.
  4. Do not dust surface with dry materials.
  5. Use evaporation retardant.

6. Round off edges of slabs with a steel edging tool, except where a cove finish is shown. Steel edging tool radius shall be 1/4" for slabs subject to wheeled traffic.
- B. Type S-1 (Steel Troweled Finish):
1. Finish by screeding and floating with straightedges to bring surfaces to required finish elevation, use evaporation retardant.
  2. While concrete is still green, but sufficiently hardened to bear a person's weight without deep imprint, wood float to true, even plane with no coarse aggregate visible.
  3. Use sufficient pressure on wood floats to bring moisture to surface.
  4. After surface moisture has disappeared, hand trowel concrete to produce smooth, impervious surface, free from trowel marks.
  5. Burnish surface with an additional troweling. Final troweling shall produce a ringing sound from trowel.
  6. Do not use dry cement or additional water during troweling, nor will excessive troweling be permitted.
  7. Power Finishing:
    - a. An approved power machine may be used in lieu of hand finishing in accordance with directions of machine manufacturer.
    - b. Do not use power machine when concrete has not attained the necessary set to allow finishing without introducing high and low spots in slab.
    - c. Do first steel troweling for slab S-1 finish by hand.
- C. Type S-2 (Wood Float Finish):
1. Finish slabs to receive fill and mortar setting beds by screeding with straightedges to bring surface to required finish plane.
  2. Wood float finish to compact and seal surface.
  3. Remove laitance and leave surface clean.
  4. Coordinate with other finish procedures.
- D. Type S-3 (Underside Elevated Slab Finish): When forming is removed, grind off projections on underside of slab and patch defective areas, including small shallow air pockets where schedule of concrete finishes requires painting or protective coating.
- E. Type S-5 (Broomed Finish):
1. Finish as specified for Type S-1 floor finish, except omit final troweling and finish surface by drawing a fine-hair broom lightly across the surface.
  2. Broom in same direction and parallel to expansion joints, or, in the case of inclined slabs, perpendicular to slope, except for round roof slab, broom surface in radial direction.
- F. Type S-6 (Sidewalk Finish):
1. Slope walks down 1/4" per foot away from structures, unless otherwise shown.
  2. Strike off surface by means of strike board and float with wood or cork float to a true plane, then flat steel trowel before brooming.
  3. Broom surface at right angles to direction of traffic or as shown.
  4. Lay out sidewalk surfaces in blocks, as shown or as directed by Engineer, with a grooving tool.
- G. Type S-7: The top surfaces of basins in which raking mechanisms are to be installed
1. Slabs shall be finished by sweeping in cement grout with the mechanism. The cement grout to be used shall be composed of one part Portland cement and two parts sand.

2. The sweeping-in process shall be performed under the supervision of a factory representative of the equipment manufacturer.
3. The slab upon which the grout is to be applied shall receive a Type S-5 finish except that after leveling and floating, it shall be raked in such a manner as to provide a good bond for the grout. Raking shall develop a pattern with a depth of 1/4" every 2". Before grout is deposited on the slab, it shall be thoroughly cleaned, wet down with clean water and lightly dusted with neat cement immediately prior to placement of the grout.

### 3.12 MISCELLANEOUS CONCRETE ITEMS

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

### 3.13 CONCRETE PROTECTING AND CURING

- A. **General:** Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. **Evaporation Retarder:** Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. **Formed Surfaces:** Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. **Unformed Surfaces:** Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. **Cure concrete according to ACI 308.1, by one or a combination of the following methods:**
  1. **Moisture Curing:** Keep surfaces continuously moist for not less than seven days with the following materials:
    - a. **Water.**

- b. Continuous water-fog spray.
- c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
- 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
  - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
  - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
  - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.
- 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
  - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.
- 4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

### 3.14 LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.
  - 1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
  - 2. Do not apply to concrete that is less than 28 days' old.
  - 3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.
- B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller according to manufacturer's written instructions.

### 3.15 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
  - 1. Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

- C. Install semi-rigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

### 3.16 REPAIRING CONCRETE

#### A. General:

1. Any areas deemed as having excessive defects or considered to have a negative effect on the structural performance of the structure shall be removed to the extents approved by the Engineer. The Engineer has the option of calling for the removal of the entire section if the damage is such that a repair will not be a suitable option. All work required to correct the defect will be the responsibility of the Contractor and will be paid for by the Contractor.
2. Inject cracks with crack repair epoxy.
3. Repair concrete surfaces defects as required to meet the contract requirements. Select system, submit for review, and obtain approval from Engineer prior to use.
4. Prior to starting the repair work, obtain quantities of color-matched repair material and manufacturer's detailed instructions for use to provide a structural repair with finish to match adjacent surface.
5. Develop repair techniques with material manufacturer.
6. Dress surface of repair that will remain exposed to view to match color and texture of adjacent surfaces. Repair of concrete shall provide a structurally sound surface finish, uniform in appearance or upgrade finish by other means until acceptable to Engineer.

#### B. Tie Holes:

1. Fill with non-shrink grout.
2. Match color of adjacent concrete.
3. Compact grout using steel hammer and steel tool to drive grout to high density. Cure grout with water.

#### C. Alternate Form Ties-Through-Bolts:

1. Seal through-bolt hole by sandblasting or mechanically cleaning and roughening entire interior surface of hole, coating roughened surface with bonding agent and driving elastic vinyl plug and then dry packing entire hole on each side of plug with non-shrink grout. Use only enough water to dry pack grout. Dry pack while bonding agent is still tacky or remove bonding agent by mechanical means and reapply new bonding agent.
2. Compact grout using steel hammer and steel tool to drive grout to high density. Cure grout with water.

#### D. Exposed Metal Objects:

1. Metal objects not intended to be exposed in as-built condition of structure including wire, nails, and bolts, shall be removed by chipping back concrete to depth of 1 inch and then cutting or removing metal object.
2. Repair areas of chipped-out concrete.

#### E. Blockouts at Pipes or Other Penetrations:

1. Meet details shown or submit proposed blockouts for review.
2. Use non-shrink, nonmetallic grout, Category I or II.

### 3.17 FIELD QUALITY CONTROL

- A. **Testing and Inspecting:** Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports. Payment of the testing and inspection agency shall be by the Contractor from the contract allowance for independent testing in accordance with Section 01 11 11 BASIS OF PAYMENT.
- B. **Inspections:**
1. Steel reinforcement placement.
  2. Headed bolts and studs.
  3. Verification of use of required design mixture.
  4. Concrete placement, including conveying and depositing.
  5. Curing procedures and maintenance of curing temperature.
  6. Verification of concrete strength before removal of shores and forms from beams and slabs.
- C. **Concrete Tests:** Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. **Testing Frequency:** Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd. plus one set for each additional 50 cu. yd. or fraction thereof.
    - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
  2. **Slump:** ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
  3. **Air Content:** ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
  4. **Concrete Temperature:** ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
  5. **Compression Test Specimens:** ASTM C 31/C 31M.
    - a. Cast and laboratory cure two sets of three standard cylinder specimens for each composite sample.
    - b. Cast and field cure two sets of three standard cylinder specimens for each composite sample.
  6. **Compressive-Strength Tests:** ASTM C 39/C 39M; test one set of three laboratory-cured specimens at 7 days and one set of three specimens at 28 days.
    - a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days. The third cylinder will be retained for subsequent testing if required by the Engineer.
    - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
  7. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
  8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength

- and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
9. Test results shall be reported in writing to Engineer, Owner, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
  10. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
  11. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
  12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
  13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- D. Measure floor and slab flatness and levelness according to ASTM E 1155 48 hours of finishing. Specified overall values of flatness  $F(f)=25$ ; and levelness  $F(L)20$ ; with minimum local values,  $F(f)=17$  and  $01=$  levelness  $F(L)15$ .  $F(L)$  value only applies to elevated slabs after shoring has been removed.  $F(L)$  value does not apply to elevated slabs after shores have been removed or to sloped slabs on grade.
- E. Shrink Tests
1. Drying shrinkage tests shall be performed for the trial batch indicated in Paragraph CONCRETE MIXTURES FOR HYDRAULIC ELEMENTS for the first placement of each class of concrete for all structures noted in paragraph CONCRETE MIXTURES FOR HYDRAULIC ELEMENTS, and during construction to insure continued compliance with these Specifications. Number of field test to be determined by Engineer or Engineer's Field Representative.
  2. Drying shrinkage specimens shall be 4" by 4" by 11" prisms with an effective gauge length of 10"; fabricated, cured, dried, and measured in accordance with ASTM C 157 modified as follows: specimens shall be removed from molds at an age of  $23 \pm 1$  hours after trial batching, shall be placed immediately in water at  $70 \text{ }^\circ\text{F} \pm 3 \text{ }^\circ\text{F}$  for at least 30 minutes, and shall be measured within 30 minutes thereafter to determine original length and then submerged in saturated lime water at  $73 \text{ }^\circ\text{F} \pm 3 \text{ }^\circ\text{F}$ . Measurement to determine expansion expressed as a percentage of original length shall be made at age 7 days. This length at age 7 days shall be the base length for drying shrinkage calculations ("0" days drying age). Specimens then shall be stored immediately in a humidity control room maintained at  $73 \text{ }^\circ\text{F} \pm 3 \text{ }^\circ\text{F}$  and  $50\% \pm 4\%$  relative humidity for the remainder of the test. Measurements to determine shrinkage expressed as percentage of base length shall be made and reported separately for 7, 14, 21, and 28 days of drying after 7 days of moist curing.
  3. The drying shrinkage deformation of each specimen shall be computed as the difference between the base length (at "0" days drying age) and the length after drying at each test age. The average drying shrinkage deformation of the specimens shall be computed to the nearest 0.0001" at each test age. If the drying shrinkage of any specimen departs from the

average of that test age by more than 0.0004", the results obtained from that specimen shall be discarded. Results of the shrinkage test shall be reported in graphical form Length Change (in) vs. Age (days) and Length Change (%) vs. Age (days) to the nearest 0.001% of shrinkage. Compression test specimens shall be taken in each case from the same concrete used for preparing drying shrinkage specimens. These tests shall be considered a part of the normal compression tests for the project. Allowable shrinkage limitations shall be as indicated below.

- a. **Shrinkage Limitation:** The maximum concrete shrinkage for specimens cast in the laboratory from the trial batch, as measured at 21-day drying age or at 28-day drying age shall be 0.036% or 0.042%, respectively. The Contractor shall only use a mix design for construction that has first met the trial batch shrinkage requirements. Shrinkage limitations apply only to all concrete used for hydraulic structures and structures noted in paragraph CONCRETE MIXTURES FOR HYDRAULIC ELEMENTS.
- b. The maximum concrete shrinkage for specimens cast in the field shall not exceed the trial batch maximum shrinkage requirement by more than 25%.
- c. If the required shrinkage limitation is not met during construction, the Contractor shall take any or all of the following actions at no additional cost to the Owner, for securing the specified shrinkage requirements. These actions may include changing the source of aggregates, cement and/or admixtures; reducing water content; washing of aggregate to reduce fines; increasing the number of construction joints; modifying the curing requirements; or other actions designed to minimize shrinkage or the effects of shrinkage.

**F. Water Leakage Tests:**

1. **Purpose:** Determine integrity and water tightness of finished concrete surfaces. Contractor shall perform and pay for all costs associated with water leakage tests. Report all test results to the Engineer.
2. **All water-holding Structures:**
  - a. Perform leakage tests after concrete structure is complete and capable of resisting the hydrostatic pressure of the water test. The concrete shall have achieved its full design strength.
  - b. Perform leakage test before backfill, brick facing, or other work that will cover concrete wall surfaces is begun.
  - c. Install all temporary bulkheads, cofferdams, and pipe blind flanges, and close all valves. Inspect each to see that it provides a complete seal.
  - d. Fill with water to test level shown, or maximum liquid level if no test level is given. Maintain this level for 72 hours prior to the start of the test to allow water absorption, structural deflection, and temperature to stabilize.
  - e. Measure evaporation and precipitation by floating a partially filled, transparent, calibrated, open top container.
  - f. Measure the water surface at two points 180° apart, when possible where attachments such as ladders exist, at 24-hour intervals. Using a sharp pointed hook gauge and fixed metal measure capable of reading to 1/100 of an inch. Continue the test for a period of time sufficient to produce at least 1/2" drop in the water surface based on the assumption that leakage would occur at the maximum allowable rate specified or for 72 hours whichever is the lesser time.

**G. Acceptance Criteria:**

1. Volume loss shall not exceed 0.075% of contained liquid volume in a 24-hour period, correcting for evaporation, precipitation, and settlement.

2. No damp spots or seepage visible on exterior surfaces. A damp spot is defined as sufficient moisture to be transferred to a dry hand upon touching.
- H. Repairs When Test Fails: Dewater the structure; fill leaking cracks with crack repair epoxy. Patch areas of damp spots previously recorded, and repeat water leakage test in its entirety until the structure successfully passes the test

END OF SECTION 03 30 00

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## SECTION 31 10 00 - SITE CLEARING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above and below grade site improvements.
6. Disconnecting, capping or sealing, and abandoning site utilities in place.
7. Temporary erosion and sedimentation control measures.

B. Related Sections:

1. Division 01 Section 01 50 00 "Temporary Facilities and Controls" for temporary utility services, construction and support facilities, security and protection facilities.
2. Division 01 Section 01 73 00 "Execution" for field engineering and surveying.

#### 1.3 DEFINITIONS

- A. **Subsoil:** All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- B. **Surface Soil:** Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- C. **Topsoil:** Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.
- D. **Vegetation:** Trees, shrubs, groundcovers, grass, and other plants.

**1.4 MATERIAL OWNERSHIP**

- A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.**

**1.5 SUBMITTALS**

- A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.**
  - 1. Use sufficiently detailed photographs or videotape.**
- B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.**

**1.6 PROJECT CONDITIONS**

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.**
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.**
  - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.**
- B. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.**
- C. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.**
- D. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.**

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Division 31 Section "Earth Moving."**
  - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.**

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.**
- B. Protect existing site improvements to remain from damage during construction.**
  - 1. Restore damaged improvements to their original condition, as acceptable to Owner.**

### **3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL**

- A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion and sedimentation control Drawings and requirements of authorities having jurisdiction.**
- B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.**
- C. Inspect, maintain, and repair erosion and sedimentation control measures during construction until permanent vegetation has been established.**
- D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.**

### **3.3 EXISTING UTILITIES**

- A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.**
  - 1. Verify that utilities have been disconnected and capped before proceeding with site clearing.**
- B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.**
  - 1. Arrange with utility companies to shut off indicated utilities.**
  - 2. Owner will arrange to shut off indicated utilities when requested by Contractor.**
- C. Locate, identify, and disconnect utilities indicated to be abandoned in place.**
- D. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:**
  - 1. Notify Owner not less than seven days in advance of proposed utility interruptions.**
  - 2. Do not proceed with utility interruptions without Owner's written permission.**

- E. Excavate for and remove underground utilities indicated to be removed.

### 3.4 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
  - 1. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches (450 mm) below exposed subgrade.
  - 2. Chip removed tree branches and stockpile in areas approved by Owner dispose of off-site.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
  - 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches (200 mm), and compact each layer to a density equal to adjacent original ground.

### 3.5 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
  - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.

### 3.6 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.
- B. Separate recyclable materials produced during site clearing from other non-recyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 31 10 00

## SECTION 31 23 19 - DEWATERING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This section shall cover the work of furnishing all labor and equipment required to dewater all excavations. Dewatering of all excavations shall be the responsibility of the Contractor. The presence of groundwater and surface water can be anticipated during construction.
- B. All work included in this section shall follow the standards of the Federal Occupational Safety and Health Act and the Alabama Department of Labor.
- C. Related Sections:
  - 1. Division 01 Section 01 31 00 "Project Management and Coordination" for recording pre-existing conditions and dewatering system progress.
  - 2. Division 31 Section 31 30 00 "Earth Moving" for excavating, backfilling, site grading, and for site utilities.
  - 3. Division 31 Section 31 50 00 "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.
  - 1. Continuously monitor and maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
  - 2. Prevent surface water from entering excavations by grading, dikes, or other means.
  - 3. Accomplish dewatering without damaging existing buildings, structures, and site improvements adjacent to excavation.
  - 4. Remove dewatering system when no longer required for construction.

#### 1.4 SUBMITTALS

- A. **Shop Drawings:** For dewatering system. Show arrangement, locations, and details of wells and well points; locations of risers, headers, filters, pumps, power units, and discharge lines; and means of discharge, control of sediment, and disposal of water.
  - 1. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.
  - 2. Include a written plan for dewatering operations including control procedures to be adopted if dewatering problems arise.

#### 1.5 QUALITY ASSURANCE

- A. **Installer Qualifications:** An experienced installer that has specialized in dewatering work.
- B. **Regulatory Requirements:** Comply with governing EPA notification regulations before beginning dewatering. Comply with hauling and disposal regulations of authorities having jurisdiction.

#### 1.6 PROJECT CONDITIONS

- A. **Interruption of Existing Utilities:** Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:
  - 1. Do not proceed with interruption of utility without Owner's written permission.
- B. **Project-Site Information:** A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from this data.
- C. **Survey Work:** Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.
  - 1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Owner if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

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

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.**
  - 1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding area.**
  - 2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.**
- B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.**
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.**
- C. Provide temporary grading to facilitate dewatering and control of surface water.**
- D. Monitor dewatering systems continuously.**
- E. Promptly repair damages to adjacent facilities caused by dewatering.**
- F. Protect and maintain temporary erosion and sedimentation controls, which are specified in Division 01 Section 01 50 00 "Temporary Facilities and Controls" and Section 31 10 00 "Site Clearing" during dewatering operations.**

### **3.2 CONSTRUCTION REQUIREMENTS**

- A. Dewatering of many of the construction excavations may be required to provide a dry work environment. Dewatering equipment shall be of adequate size and quantity to assure maintaining proper conditions for installing pipe, concrete, backfill or other material or structure in the excavation. Dewatering shall include proper removal of any and all liquid, regardless of its source, from the excavation and the use of all practical means available to prevent surface runoff from entering any excavation.**
- B. Temporary Underdrains: Temporary underdrains, if used, shall be laid in trenches beneath the grade of the structure. Trenches shall be of suitable dimensions to provide room for the chosen size of underdrain and its surrounding gravel.**
  - 1. Underdrain pipe shall be acceptable vitrified-clay or concrete pipe of standard thickness. Sewer pipe of the quality known as "seconds" will be acceptable.**

2. Underdrains, if used, shall be laid at a suitable distance below the bottom of the normal excavation and with open joints wrapped in cheese cloth, and entirely surrounded by graded gravel, or crushed stone to prevent the admission of sand or other soil into the underdrains. The distance between the bottom of the pipe or structure and the top of the bell of the underdrain pipe shall be at least 3 in unless otherwise permitted. The space between the underdrain and the pipe or structure shall be filled with screened gravel or crushed stone which shall be rammed if necessary and left with a surface suitable for laying the pipe or building the structure.
3. Drainage Wellpoint System: If necessary, the Contractor shall dewater the excavations by means of an efficient drainage wellpoint system which will drain the soil and prevent saturated soil from flowing into the excavation. The wellpoints shall be designed especially for this type of service. The pumping unit shall be designed for use with the wellpoints, and shall be capable of maintaining a high vacuum and of handling large volumes of air and water at the same time.
4. The installation of the wellpoints and pump shall be done under the supervision of a competent representative of the manufacturer. The Contractor shall do all special work such as surrounding the wellpoints with sand or gravel or other work, which is necessary for the wellpoint system to operate for the successful dewatering of the excavations.

### 3.3 INSTALLATION

- A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.
  1. Space well points or wells at intervals required to provide sufficient dewatering.
  2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.
- B. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.
- C. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.
  1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
- D. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.
  1. Maintain piezometric water level a minimum of 24 inches (600 mm) below surface of excavation.

- E. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.
- F. Provide standby equipment on site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to Owner.
  - 1. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches (900 mm) below overlying construction.
- G. Damages: Promptly repair damages to adjacent facilities caused by dewatering operations.

#### 3.4 FIELD QUALITY CONTROL

- A. Provide continual observation to ensure that subsurface soils are not being removed by the dewatering operation.

END OF SECTION 31 23 19

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## SECTION 31 23 50 - ROCK REMOVAL

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This section shall cover the work of furnishing all labor and equipment required for rock removal during excavations.
- B. All work included in this section shall follow the standards of the Federal Occupational Safety and Health Act and the Alabama Department of Labor.
- C. Related Sections
  - 1. Division 00 "City of Huntsville Supplement to General Requirements for Construction of Public Improvements" for Owner quantity and unit pricing requirements.
  - 2. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
  - 3. Division 01 Section 01 11 10 "Unit Prices" and Section 01 11 11 "Measurement and Payment and Basis of Payment."
  - 4. Division 31 for site clearing, dewatering, earth moving and other related work procedures.

#### 1.3 DESCRIPTION OF WORK

- A. The work under this section shall cover the following topics:
  - 1. Removal of discovered rock during excavation.
  - 2. Use of explosives for rock removal.

#### 1.4 MATERIALS

- A. Definitions:
  - 1. Rock Definition: Solid mineral material that cannot be removed with a power shove.
  - 2. Explosives: Type recommended by explosives firm and required by authorities having jurisdiction.
  - 3. Delay Devices: Type recommended by explosives firm and conforming to State regulations.

4. **Blasting Materials: Type recommended by explosives firm and conforming to State regulations.**

## **PART 2 - CONSTRUCTION REQUIREMENTS**

### **2.1 REFERENCES**

- A. **NFPA 495 - Code for the Manufacture, Transportation, Storage and Use of Explosive Materials.**
- B. **City of Huntsville Code of Ordinances, Chapter 12, Article III, State of Alabama, and Federal Laws and Regulations Governing Explosives and Blasting.**

### **2.2 QUALITY ASSURANCE**

- A. **Seismic Survey Firm: Company specializing in seismic surveys with five years documented experience.**
- B. **Explosives Firm: Company specializing in explosives for disintegration of subsurface rock with five years documented experience.**

### **2.3 REGULATORY REQUIREMENTS**

- A. **Conform to State of Alabama code for explosive disintegration of rock.**
- B. **Obtain permits from local authorities having jurisdiction before explosives are brought to site or drilling is started.**
- C. **Contractor shall conform to all State, Federal, and City laws, ordinances and regulations in regard to transportation, use, and handling of explosives.**
- D. **Indicate proposed method of blasting, delay pattern, explosive types, type of blasting mat or cover, and intended rock recovery method.**
- E. **Blasting shall be coordinated through the Fire Department. The Contractor shall adhere to all local ordinances.**

### **2.4 INSPECTION**

- A. **The Contractor shall verify site conditions and note irregularities affecting work of this Section.**
- B. **A pre-blast survey must be performed on all structures within a 1500-foot radius of all blast sites, in accordance with the Alabama Department of Transportation's standard specifications, and applicable City of Huntsville standards.**
- C. **Beginning work of this Section means acceptance of existing condition.**

**2.5 ROCK REMOVAL – MECHANICAL METHOD**

- A. Cut away rock at excavation bottom to form even surface.
- B. In utility trenches, excavate to 6 inches below invert elevation of pipe and 24 inches wider than pipe diameter.

**2.6 ROCK REMOVAL – EXPLOSIVES METHODS**

- A. If rock is uncovered requiring the explosives method for rock disintegration, notify the Owner or Owner's Representative.
- B. Advise owners of adjacent buildings or structures as well as utility companies in writing prior to setting up seismographs. Describe blasting and seismic operations.
- C. Peak particle velocity will be limited to 4.0 in/sec.
- D. Provide seismographic monitoring during progress of all blasting operations, or as required by State regulations.
- E. Disintegrate rock and remove from excavation.
- F. Contractor shall conduct all blasting in accordance with the "City of Huntsville Code of Ordinances, Chapter 12: Environmental Management, Article III. Blasting".

**2.7 FIELD QUALITY CONTROL**

- A. Owner or Owner's Representative shall approve of final rock cut.
  - 1. If rock is excavated beyond the limits of excavation indicated on the Plans, specified or authorized in writing by the Owner or Owner's Representative, the excess excavation, whether resulting from overbreakage or other causes, shall be backfilled by and at the expense of the Contractor, as specified below in this section.
  - 2. In pipe trenches, excess excavation below the elevation of the top of the bedding, cradle, or envelope shall be filled with material of the same type, placed and compacted in the same manner as specified for the bedding, cradle, or envelope. Excess excavation above said elevation shall be filled with earth as specified in Section 31 30 00, "Earth Moving".
- B. Blasting Precautions
  - 1. All operations involving explosives shall be conducted with all possible care to avoid injury to persons and property. Blasting shall be done only with such quantities and strengths of explosives and in such manner as will break the rock approximately to the intended lines and grades and yet will leave the rock not to be excavated in an unshattered condition.
  - 2. Care shall be taken to avoid excessive cracking of the rock upon or against which any structure will be built and to prevent injury to existing pipes or other structures and property above or below ground.
  - 3. Rock shall be well covered with logs or mats or both where required.

4. Sufficient warning shall be given to all persons in the vicinity of the work before a charge is exploded.
5. All blasting shall be completed within a distance of 50 feet before any portion of a structure is placed or any pipe is laid.

## 2.8 BLASTING RECORDS

- A. The Contractor shall keep and submit to the Owner or Owner's Representative an accurate record of each blast. The record shall show the general location of the blast, the depth and number of drill holes, the kind and quantity of explosive used, kind and number and interval of delay periods used, and other data required for a complete record.

## 2.9 SHATTERING ROCK

- A. Shattering rock at ends of pipe and elsewhere as indicated on the Plans shall be done by drilling and blasting a single line of holes in the vertical face of the rock at the end of the trench.
- B. Drill holes shall have a minimum depth of 4 feet and maximum spacing of 18 in. on centers. Sufficient explosive shall be used to shatter the rock for future excavation. Shattering shall be completed before any pipe or fitting is placed within 50 feet of rock to be shattered.
- C. If the rock below normal depth is shattered due to drilling or blasting operations of the Contractor, and the Owner or Owner's Representative considers such shattered rock to be unfit for foundations, the shattered rock shall be removed and the excavation shall be backfilled with gravel. All such removal and backfilling shall be done by and at the expense of the Contractor.

## 2.10 PREPARATION OF ROCK SURFACES

- A. Whenever so directed during the progress of the work, the Contractor shall remove all dirt and loose rock from designated areas and shall clean the surface of the rock thoroughly, using steam to melt snow and ice if necessary. Water in depressions shall then be removed as required so that the whole surface of the designated area can be inspected to determine whether seams or other defects exist.
- B. The surfaces of rock foundations shall be left sufficiently rough to bond well with the masonry and embankments to be built thereon and, if required, shall be cut to rough benches or steps.
  1. Before any masonry or embankment is built on or against the rock, the rock shall be scrupulously freed from all vegetation, dirt, sand, clay, boulders, scale, excessively cracked rock, loose fragments, ice, snow, and other objectionable substances.
  2. Picking, barring, wedging, streams of water under sufficient pressure, stiff brushes, hammers, steam jets, and other effective means shall be used to accomplish this cleaning. All free water left on the surface of the rock shall be removed.

## 2.11 REMOVAL OF BOULDERS

- A. Piles of boulders or loose rock encountered within the limits of earth embankments shall be removed to a suitable place of disposal.

**2.12 DISPOSAL OF EXCAVATED ROCK**

**A. Excavated rock may be used in backfilling trenches subject to the following limitations:**

- 1. Pieces of rock larger than permitted under Section 31 30 00 "Earth Moving" shall not be used for this purpose.**
- 2. The quantity of rock used as backfill in any location shall not be so great as to result in the formation of voids.**
- 3. Rock backfill shall not be placed within 16 inches of the surface of the finish grade.**
- 4. Surplus excavated rock shall be disposed of as specified for surplus excavated material as specified under Section 31 30 00 "Earth Moving".**

**END OF SECTION 31 23 50**

## SECTION 31 30 00 – EARTH MOVING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

##### A. Section Includes:

1. Preparing subgrades for slabs-on-grade, pavements, turf and grasses.
2. Excavating and backfilling for buildings and structures.
3. Drainage course for concrete slabs-on-grade.
4. Subbase course for concrete pavements.
5. Subbase course and base course for asphalt paving.
6. Subsurface drainage backfill for walls and trenches.
7. Excavating and backfilling trenches for utilities and pits for buried utility structures.

##### B. Related Sections:

1. Division 01 Section "Temporary Facilities and Controls" for temporary controls, utilities, and support facilities; also for temporary site fencing if not in another Section.
2. Division 31 Section "Site Clearing" for site stripping, grubbing, stripping topsoil, and removal of above- and below-grade improvements and utilities.
3. Division 31 Section "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.
4. Division 32 Section "Turf and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.

- C. This Section describes the earthwork necessary for excavating, backfilling and compaction for installation of new utilities. The extent of earthwork shall be as indicated on the Plans. Excavation for site piping and utilities is included as part of this work. "Excavation" consists of removal of all material encountered to subgrade elevations and subsequent disposal or reuse of materials removed. The Contractor shall furnish, place and compact all bedding and backfill materials specified herein or as denoted on the Plans.

- D. Topsoil shall be removed and stockpiled for later reuse. Subsoil shall be excavated and stockpiled for later reuse as directed in this Section. All excavated areas shall be graded and restored to near original contours or to new grading contours as directed on Plans after backfilling and compaction is completed.

- E. All work included in this section shall follow the standards of the Federal Occupational Safety and Health Act and the Alabama Department of Labor.

### 1.3 DEFINITIONS

- A. **Backfill:** Soil material or controlled low-strength material used to fill an excavation.
  - 1. **Initial Backfill:** Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
  - 2. **Final Backfill:** Backfill placed over initial backfill to fill a trench.
- B. **Base Course:** Aggregate layer placed between the subbase course and hot-mix asphalt paving.
- C. **Bedding Course:** Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- D. **Borrow Soil:** Satisfactory soil imported from off-site for use as fill or backfill.
- E. **Drainage Course:** Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
- F. **Excavation:** Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
  - 1. **Authorized Additional Excavation:** Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Owner.
  - 2. **Bulk Excavation:** Excavation more than 10 feet (3 m) in width and more than 30 feet (9 m) in length.
  - 3. **Unauthorized Excavation:** Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Owner. Unauthorized excavation, as well as remedial work directed by Owner, shall be without additional compensation.
- G. **Fill:** Soil materials used to raise existing grades.
- H. **Rock:** Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. (0.76 cu. m) for bulk excavation or 3/4 cu. yd. (0.57 cu. m) for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:
  - 1. **Excavation of Footings, Trenches, and Pits:** Late-model, track-mounted hydraulic excavator; equipped with a 42-inch- (1065-mm-) wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp (103-kW) flywheel power with bucket-curling force of not less than 28,700 lbf (128 kN) and stick-crowd force of not less than 18,400 lbf (82 kN) with extra-long reach boom; measured according to SAE J-1179.
  - 2. **Bulk Excavation:** Late-model, track-mounted loader; rated at not less than 230-hp (172-kW) flywheel power and developing a minimum of 47,992-lbf (213.3-kN) breakout force with a general-purpose bare bucket; measured according to SAE J-732.
- I. **Structures:** Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

- J. **Subbase Course:** Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
- K. **Subgrade:** Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- L. **Utilities:** On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

#### 1.4 SUBMITTALS

- A. **Product Data:** For each type of the following manufactured products required:
  - 1. Controlled low-strength material, including design mixture.
  - 2. Warning tapes.
- B. **Qualification Data:** For qualified testing agency.
- C. **Material Test Reports:** For each borrow soil material proposed for fill and backfill as follows:
  - 1. Classification according to ASTM D 2487.
  - 2. Laboratory compaction curve according to ASTM D 698.
- D. **Blasting plan** approved by authorities having jurisdiction.
- E. **Seismic survey report** from seismic survey agency.
- F. **Copies of all test reports and field reports** shall be made available to the Owner and the Owner's Representative.
- G. **The Contractor shall provide access to site areas, borrow pits and other areas for testing.** The Contractor shall also indicate when there is a need for tests to be performed. The Contractor is responsible for preparation for any tests necessary for the conduct of the Work.

#### 1.5 QUALITY ASSURANCE

- A. **Blasting:** Comply with applicable requirements in NFPA 495, "Explosive Materials Code," and prepare a blasting plan reporting the following:
  - 1. Types of explosive and sizes of charge to be used in each area of rock removal, types of blasting mats, sequence of blasting operations, and procedures that will prevent damage to site improvements and structures on Project site and adjacent properties.
  - 2. Seismographic monitoring during blasting operations.
- B. **Seismic Survey Agency:** An independent testing agency, acceptable to authorities having jurisdiction, experienced in seismic surveys and blasting procedures to perform the following services:

1. Report types of explosive and sizes of charge to be used in each area of rock removal, types of blasting mats, sequence of blasting operations, and procedures that will prevent damage to site improvements and structures on Project site and adjacent properties.
  2. Seismographic monitoring during blasting operations.
- C. **Geotechnical Testing Agency Qualifications:** Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.
- D. **Codes and Standards:** Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.
- E. **Testing and Inspection Service:** The Owner shall select the services of a qualified geotechnical engineering, inspection, and testing firm for quality control testing during earthwork operations. The Contractor shall coordinate testing and inspection with the testing firm for services directed by the Owner and/or the Owner's Representative.
- F. **Inspection:** Verify that all stockpiled fill to be reused is approved. Verify areas to be backfilled are free of debris, snow, ice, or water, and surfaces are not frozen. Verify foundation perimeter drainage installation has been inspected.

#### 1.6 PROJECT CONDITIONS

- A. **Traffic:** Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
  2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. **Improvements on Adjoining Property:** Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.
1. Do not proceed with work on adjoining property until directed by Owner.
- C. **Utility Locator Service:** Notify utility locator service for area where Project is located before beginning earth moving operations.
- D. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures, specified in Division 01 Section "Temporary Facilities and Controls" and Division 31 Section "Site Clearing," are in place.
- E. **Project-Site Information:** A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from this data.
1. The Contractor may conduct test borings and other exploratory operations.

2. Identify all required lines, levels, contours and datum necessary during construction work.
- F. Prior to commencement of work, the Contractor shall locate existing underground utilities in areas of the work. If utilities are to remain in place, provide adequate means of protection during earthwork operations where required. Upon discovery of unknown utility or concealed conditions, affected work shall be discontinued until the Owner and the Owner's Representative are notified.

## PART 2 - MATERIALS

### 2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
  1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- F. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- G. Sand: ASTM C 33; fine aggregate.
- H. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.
- I. Drainage fill: Washed, uniformly graded mixture of crushed stone or crushed gravel conforming to No. 2 of The Table of ALDOT Coarse Aggregate Sizes of the Alabama Department of Transportation (ALDOT) Standard Specifications.
- J. Backfill and non-structural fill materials: Satisfactory soil materials free of debris, waste, frozen materials, vegetable, and other deleterious matter.

- K. Topsoil: Excavated material, graded free of roots, rocks larger than one inch, subsoil, debris, and large weeds.
- L. Subsoil: Excavated material, graded free of lumps larger than 12 inches, rocks larger than 12 inches and debris.

## 2.2 MATERIAL REQUIREMENTS

- A. The nature of the materials will govern both their acceptability for backfill and the methods best suited for their placement and compaction in the backfill. No stone or rock fragment larger than 12 inches in greatest dimension shall be placed in the backfill nor shall large masses of backfill materials be dropped into the trench in such a manner as to endanger the pipeline. If necessary, a timber grillage shall be used to break the fall of material dropped from a height of more than 5 feet. Pieces of bituminous pavement shall be excluded from the backfill unless their use is expressly permitted, in which case they shall be broken up as directed.

### 1. Crushed Stone

- a. Crushed stone material shall conform with the requirement of the applicable sections of the ALDOT Standard Specifications and shall consist of clean, hard, and durable particles or fragments, free from dirt, vegetation or objectionable materials. Two classes of crushed stone may be referred to in this Section as:

- 1) Class I – ALDOT No. 78 Aggregate.
- 2) Class II – Dense Graded Aggregate (DGA).

- B. Use of explosives shall not be allowed without prior written approval from the Owner. Contractor shall refer to the “City of Huntsville Code of Ordinances, Chapter 12: Environmental Management, Article III. Blasting” latest revision for details.

### C. Protection of Persons and Property

- 1. Barricade open excavations occurring as part of this work and post with warning lights. Operate warning lights as recommended by authorities having jurisdiction.
- 2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- 3. Protect trees and other features remaining as portion of final landscaping.
- 4. Protect benchmarks, existing structures, fences, roads, sidewalks, and other features not designated for demolition. Contractor shall be responsible to repair any damage to those items not designated for demolition or removal in a manner satisfactory to the Owner.

- D. Material Storage: Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade, and shape all stockpiles for proper drainage.

## 2.3 TOLERANCES

- A. Top Surface of Subgrade: Plus or minus three (3) inches.

- B. **Top Surface of Backfilling: Plus or minus one (1) inch.**

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. **Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.**
- B. **Protect and maintain erosion and sedimentation controls during earth moving operations.**
- C. **Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.**

#### **3.2 DEWATERING**

- A. **Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.**
- B. **Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.**
  - 1. **Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.**
- C. **Dewatering and Drainage: Refer to Section 31 23 19 for dewatering and drainage requirements. It is anticipated that dewatering and/or drainage may be required at excavations.**

#### **3.3 EXPLOSIVES**

- A. **Explosives: Obtain written permission from authorities having jurisdiction before bringing explosives to Project site or using explosives on Project site.**
  - 1. **Perform blasting without damaging adjacent structures, property, or site improvements.**
  - 2. **Perform blasting without weakening the bearing capacity of rock subgrade and with the least-practicable disturbance to rock to remain.**

#### **3.4 EXCAVATION, GENERAL**

- A. **Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.**

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
  2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:
    - a. 24 inches outside of concrete forms other than at footings.
    - b. 12 inches outside of concrete forms at footings.
    - c. 6 inches outside of minimum required dimensions of concrete cast against grade.
    - d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
    - e. 6 inches beneath bottom of concrete slabs-on-grade.
    - f. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.
- B. Excavation includes excavation to subgrade elevations including excavation of earth, rock, bricks, wood, cinders, and other debris. All excavation shall conform to 29CFR, Part 1926, Subpart P.
- C. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the Owner or the Owner's Representative.
- D. When excavation has reached required subgrade elevations, notify the Owner or Owner's Representative who will make an inspection of conditions. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavation deeper and replace excavated material as directed in writing by the Owner or Owner's Representative at no additional expense to the Owner and/or Engineer.
- E. Stability of Excavations:
1. Slope sides of excavations to comply with OSHA regulations and all other ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
  2. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

### 3.5 SHORING AND BRACING

- A. Sheeting and shoring of trenches shall be provided where necessary to protect life, property and the new or existing structures from damage or to maintain maximum permissible trench widths at top of pipe. All necessary materials, including, but not limited to, sheeting, sheet piling, trench jacks, braces, shores and stringers, shall be used to hold trench walls. Sheeting and shoring may be withdrawn as the trenches are being backfilled, after backfill has been tamped over top of the pipe at least 18 inches. If removal before backfill is completed to surface endangers adjacent structures, such as buildings, pipelines, street paving, and sidewalks, then the sheeting and shoring shall be left in place until such danger has passed, and then pulled if practical. Voids caused by sheeting withdrawal shall be backfilled and tamped. If not withdrawn, sheeting shall be cut off at least 18 inches below final surface grade, so there is no obstruction at the ground level.

- B. The Contractor shall furnish, put in place, and maintain such sheeting, bracing, etc. as may be necessary to support the sides of the excavation and to prevent any movement of earth which could in any way diminish the width of the excavation to less than that necessary for proper construction, or could otherwise injure or delay the work, or endanger adjacent structures.
- C. Where unstable material is encountered or where the depth of excavation in earth exceeds 5 feet, the sides of the trench or excavation shall be supported by substantial sheeting, bracing, and shoring, or the sides sloped to the angle of repose. Sloping the sides of the ditch to the angle of repose will not be permitted in streets, roads, narrow rights-of-way or other constricted areas unless otherwise specified. The design and installation of all sheeting, sheet piling, bracing and shoring shall be based on computations of pressure exerted by the materials to be retained under obtaining conditions. Adequate and proper shoring of all excavations shall be the entire responsibility of the Contractor; however, the Owner or Owner's Representative may require the submission of shoring plans (accompanied by supporting computations) for approval prior to the Contractor undertaking any portion of the work. The standards of the Federal Occupational Safety and Health Act and the Alabama Department of Labor shall be followed.
- D. Whenever possible, sheeting shall be driven ahead of the excavation to avoid loss of material from behind the sheeting. If it is necessary to excavate below the sheeting, care shall be taken to avoid trimming behind the face along which the sheeting will be driven. Care shall be taken to prevent voids outside of the sheeting, but if voids occur, they shall be filled immediately with sand and compacted.
- E. The Contractor shall leave in place to be embedded in the backfill, or concrete, all sheeting, bracing, etc. which indicated on the Plans to be so left in place. The Contractor also shall leave in place any and all other sheeting, bracing, etc. which the Owner or Owner's Representative may direct him in writing to leave in place at any time during the progress of the work for the purpose of preventing injury to structures or property.
- F. The Owner or Owner's Representative may direct that sheeting and bracing be cut at any specified elevation.
- G. All sheeting and bracing not to be left in place shall be carefully removed in such manner as not to endanger the construction or other structures. All voids left or caused by the withdrawal of sheeting shall be backfilled immediately using suitable materials and compaction methods.

### 3.6 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
  - 1. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended as bearing surfaces.

### 3.7 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades. The Contractor shall remove only as much of any existing pavement as is necessary for the prosecution of the work in a paved area.
- B. Excavation for Pavements: The Contractor shall remove only as much of any existing pavement as is necessary for the prosecution of the work. Pavement shall be sawcut. Where pavement is removed in large pieces, it shall be disposed of before proceeding with the excavation.

### 3.8 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
  - 1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.
  - 1. Clearance: 12 inches (300 mm) each side of pipe or conduit.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade. Excavate trenches to allow for bedding course as indicated below and shown on the Standard Details. Hand-excavate deeper for bells of pipe.
  - 1. Excavate trenches 6 inches (150 mm) deeper than elevation required within stable soil.
  - 2. Excavate trenches 12 inches (300 mm) deeper than elevation required within rock, unstable, soft or other unyielding bearing material to allow for bedding course.
- D. All existing facilities shall be protected from danger or damage while pipelines are being constructed and backfilled, and from damage due to settlement of the backfill.
- E. From areas within which excavations are to be made, loam and topsoil shall be carefully removed and separately stored to be used again as directed; or, if the Contractor prefers not to separate surface materials, the Contractor shall furnish, as directed, loam and topsoil at least equal in quantity and quality to that excavated.
- F. In the event any existing structure is damaged, repair and restoration shall be made at once and backfill shall not be replaced until this is done. Restoration and repair shall be such that the damaged structure is equal to or better than its original condition and can serve its purpose as completely as before.
- G. Trenches must be dug to lines and grades shown on the Plans. Hand trenching may be required in areas where machine trenching would result in undue damage to existing structures and facilities.
- H. Where pipe is to be laid in gravel bedding or concrete cradle, the trench may be excavated by machinery to, or just below, the designated subgrade, provided that the material remaining at

the bottom of the trench is no more than slightly disturbed and existing pipe to remain is not damaged.

1. Where pipe is to be laid directly on the trench bottom, the lower part of trenches in earth shall not be excavated to subgrade by machinery. However, just before the pipe is to be placed, the last of the material to be excavated shall be removed by means of hand tools to form a flat or shaped bottom, true to grade, so that the pipe will have a uniform and continuous bearing and support on firm and undisturbed material between joints except for limited areas where the use of pipe slings may have disturbed the bottom. Notching shall be provided under pipe bells.
2. The location of the pipelines and their appurtenances as shown on the Plans are those intended for the final construction. However, conditions may present themselves before construction on any line is started that would indicate desirable changes in location. The Owner reserves the right to make reasonable changes in line and structure locations. The Owner is under no obligation to locate pipelines so they may be excavated by machine.
3. The Contractor shall only have sufficient trench open ahead of the pipe laying work as necessary for the prosecution of the work that day. Dig trenches to the uniform width required for the particular item to be installed, sufficiently wide to provide ample working room. Provide a minimum of 12 inches clearance on both sides of pipe or conduit. In doing this, based on backfill requirements, the Contractor must use 12 inches of stone on sides of pipe, even for smaller diameter pipes.
  - a. Excavate trenches to depth indicated or required. Carry depth of trenches for piping to establish indicated flow lines and invert elevations. Beyond building perimeter, keep bottoms of trenches sufficiently below finish grade to avoid freeze-ups.
  - b. Where rock is encountered, carry excavation 12 inches below required elevation and backfill with a 12 inch layer of crushed stone or gravel prior to installation of pipe as shown on the Standard Details.
  - c. For pipes or conduit 6 inches or larger in nominal size excavate to subbase depth indicated or, if not otherwise indicated, to 6 inches below of work to be supported.
  - d. Except as otherwise indicated, excavate for piping so top of piping is no less than 3-feet 0-inches below finish grade.
  - e. Encase pipe with concrete (full encasement) where trench excavations pass within 18 inches of columns, wall footings, or slabs, or which pass under wall footings. Place concrete to level of bottom of adjacent footing(s) or slab.
  - f. Concrete is specified in Division 03.
  - g. For pipe which is not to be pressure-tested, do not backfill trenches until tests and inspections have been made and backfilling authorized by the Owner or Owner's Representative. Use care in backfilling to avoid damage or displacement of pipe systems.
  - h. Pipe trenches shall be made as narrow as practicable and shall not be widened by scraping or loosening materials from the sides. Every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed and consolidated.
  - i. Trenches shall be excavated with approximately vertical sides between the elevation of the center of the pipe and an elevation 1-foot above the top of the pipe.
  - j. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35°F (1°C).

- k. **Depth of Trench:** Trenches shall be excavated to such depths as will permit the pipe to be laid at the elevations, slopes, or depths of cover as indicated on the Plans, and at uniform slopes between indicated elevations.
- l. **Trench Excavation in Fill:** If pipe is to be laid in embankments or other recently filled material, the material shall first be placed to the top of the fill or to a height of at least 1 foot above the top of the pipe, whichever is the lesser. Particular care shall be taken to ensure maximum consolidation of material under the pipe location. The pipe trench shall be excavated as though in undisturbed material.
- m. **Rock Removal:** Rock Removal is specified in Section 31 23 50.

### 3.9 SUBGRADE INSPECTION

- A. Notify Owner when excavations have reached required subgrade.
- B. If Owner determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed at no additional expense to the Owner and/or Engineer.
- C. Proof-roll subgrade below the building slabs and pavement with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
  - 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
  - 2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.
- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Owner, without additional compensation.

### 3.10 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa), may be used when approved by Owner.
  - 1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Owner.

### 3.11 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

### 3.12 PIPE BEDDING

- A. All pipe shall be laid on a bed of granular material except when a concrete encasement situation occurs. All pipe bedding material shall be Class I and shall be placed to a minimum depth of 6 inches in a stable earth trench and a minimum depth of 12 inches in a rock or unstable earth trench. The Contractor will not be permitted to use dense graded aggregate material for pipe bedding.
- B. Pipe bedding shall be graded to provide for a uniform and continuous support beneath the pipe at all points.
- C. After each pipe has been brought to grade, aligned, and placed in final position, Class I material shall be deposited and densified under the pipe haunches and on each side of the pipe, up to the spring line of the pipe or as indicated on the Standard Details, to prevent lateral displacement and hold the pipe in proper position during subsequent pipe jointing, bedding, and backfilling operations.
- D. In wet, yielding and mucky locations where pipe is in danger of sinking below grade or floating out of grade or line, or where backfill materials are of such a fluid nature that such movements of pipe might take place during the placing of the backfill, the pipe must be weighted or secured permanently in place by such means as will prove effective.
- E. Where an unstable (i.e., water, mud, etc.) trench bottom is encountered, stabilization of the trench bottom is required. This is to be accomplished by undercutting the trench depth and replacing to grade with a foundation of crushed stone aggregate. The depth of the foundation is dependent upon the severity of the trench bottom. The size of stone aggregate used in the foundation will be determined by the condition of the unstable material. Once the trench bottom has been stabilized, the required ALDOT #78 crushed stone aggregate bedding material can be placed.
- F. No pipe shall be laid on solid or blasted rock.

### 3.13 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
  - 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
  - 2. Surveying locations of underground utilities for Record Documents.
  - 3. Testing and inspecting underground utilities.
  - 4. Removing concrete formwork.
  - 5. Removing trash and debris.
  - 6. Removing temporary shoring and bracing, and sheeting.
  - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.
- C. All material to be used as backfill material shall be tested and approved by the Owner or Owner's Representative prior to backfilling excavations.

- D. With the exception of the organic and inorganic debris, and topsoil, the on-site soil removed from the excavations could be used as non-structural/non-low permeability fill or vegetative backfill material provided the moisture content of the soil is within acceptable limits and the Geotechnical Engineer approves the material for the intended use. However, offsite borrow material may be required for use as non-structural fill.
- E. Place acceptable backfill material in maximum 6 inch to 8-inch lifts (loose thickness) as specified on Standard Details to required subgrade elevations, for each area classification listed below:
1. In excavations, use satisfactory excavated or borrow material.
  2. Under slabs, use drainage fill material for a minimum depth of 6 inches. Below drainage fill use satisfactory excavated or borrow material.
  3. Backfill excavations as promptly as work permits, but not until completion of the following:
  4. Acceptance of construction below finish grade.
  5. It is recommended, but not required, that inspection and testing of the sanitary sewer, manholes and forcemain be conducted prior to backfilling. The documentation may be of benefit at time of the final testing, which is mandatory after all other utilities are installed, roadway sub-grade is laid, and backfill is complete. Final testing requirements are listed in Section 33 00 00.
  6. Recording locations of underground utilities.
  7. Removal of concrete formwork.
  8. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.
  9. Removal of trash and debris.
  10. As soon as practicable after the pipes have been laid and the connection joints have acquired a suitable degree of hardness, if applicable, or the structures have been built and are structurally adequate to support the loads, including construction loads to which they will be subjected, the backfilling shall be started and thereafter it shall proceed until its completion.
  11. It is recommended that trenches not be backfilled at pipe joints until after that section of the pipeline has successfully passed the required and specified tests. Should the Contractor wish to minimize the maintenance of lights and barricades and the obstruction of traffic, he may, at his own risk, backfill the entire trench as soon as practical provided the joints have acquired a suitable degree of hardness, if applicable, and the related structures have acquired a suitable degree of strength. The Contractor shall, however, be responsible for removing and later replacing such backfill, at his own expense, should he be ordered to do so in order to locate and repair or replace leaking or defective joints or pipe. Any inspection and testing documentation may be of benefit at time of the final testing, which is mandatory after all other utilities are installed, roadway sub-grade is laid, and backfill is complete. Final testing requirements are listed in Section 33 00 00. The approval and acceptance of the sewer lines, manholes and forcemain will be based on the final testing.
  12. Excavated materials from trenches in excess of the quantity required for trench backfill, shall be disposed of by the Contractor. It shall be the responsibility of the Contractor to obtain location or permits for its disposal, unless specific waste areas have been designated on the Plans.

13. The Contractor shall protect all sewer, gas, electric, telephone, water, and drain pipes or conduits from damage while pipelines are being constructed and backfilled, and from danger due to settlement of trench backfill.
14. On completion of the Work, all backfill shall be dressed; holes filled; and surplus material hauled away.

### 3.14 UTILITY TRENCH BACKFILL

#### A. Initial Backfill (See Details):

1. This backfill is defined as the material that is placed over the pipe from the spring line to a point 12 inches above the top of the pipe.
2. **Zone Around Pipe:** The zone around the pipe shall be backfilled with the materials and to the limits indicated on the Standard Details. Material shall be compacted by tamping to the percentages shown on the Standard Details. Uneven places in the backfill shall be leveled by hand.
3. In areas where large quantities of rock are excavated and the available excavated earth in the immediate vicinity is insufficient for placing the required amount of backfill over the top of the pipe, the Contractor shall either haul in earth or order Class I material for backfilling over the pipe. Neither the hauling and placement of earth nor the ordering and placement of Class I material to fulfill the backfill requirements set forth herein is considered a separate pay item.
4. Packing of crushed stone between joints shall be uniform and progress as the pipe laying progresses. This is in order to avoid danger of misalignment from slides, flooding or other causes.

#### B. Final Backfill (See Details):

1. There are two cases where the method of final backfilling varies. The various cases and their trench situations are as follows:
  - a. **Case I - Areas not subject to vehicular traffic.**
  - b. **Case II - Paved areas including streets, drives and walks where horizontal borings are not specified.**
2. In all cases, walking or working on the completed pipelines, except as may be necessary in backfilling, will not be permitted until the trench has been backfilled to a point twelve (12) inches above the top of the pipe. The method of final backfilling for each of the above cases is as follows:
  - a. **Case I – Non-Traffic Areas -** The trench shall be backfilled from a point as indicated on the Standard Details to finish grade with earth material free from large rock (over one-half cubic foot in volume), acceptable to the Owner or Owner's Representative. The backfill material should be placed in 12 in. lifts and compacted to 92% Standard Proctor Test. The remainder of the trench shall be backfilled with earth material reasonably free of any rocks.
  - b. **Case II – Traffic Areas –**

- 1) **Option 1** - The trench shall be backfilled from the top of the pipe to the sub-grade of pavement surface with Class I material. The backfill shall be installed as shown on the Standard Details.
- 2) **Option 2** – (This option available for trench depths greater than 15 feet only.) The trench shall be backfilled from a point as indicated on the Standard Details to a point 6 inches below dense graded base material with earth material free from large rock (over one-half cubic foot in volume), acceptable to the Owner or Owner's Representative. The backfill material should be placed in 6 inch lifts and compacted to 95% Standard Proctor Test. The 6 inches of pavement subgrade as indicated on the standard details shall be compacted to 100% Standard Proctor Test.
- 3) **Option 3** – Controlled Low Strength (CLSM) or Flowable Backfill
  - a) **Description:** This work shall consist of placing of flowable backfill in lieu of compacted soil or aggregate backfill.
  - b) **Materials:** Cement type shall be approved by Owner prior to installation.
  - c) Fly Ash shall have no specific requirement for fineness, loss of ignition, or reactivity.
  - d) Water shall conform to the requirements of the City of Huntsville Standard Design Specifications.
  - e) Aggregates shall conform to Division 03 and the requirements of the City of Huntsville Standard Design Specifications with a combined gradation as determined by the Contractor.
  - f) Admixtures shall conform to Division 03 and the requirements of the City of Huntsville Standard Design Specifications.
  - g) Granulated Iron Blast Furnace Slag shall conform to the requirements of Division 03 and the City of Huntsville Standard Design Specifications.
  - h) **Mixture Design:** Mixture design for flowable backfill shall be provided by the Contractor. Flowable backfill shall have a design compressive strength of 30 to 200 psi at 28 days when tested in accordance with AASHTO T-23. Mixture design shall result in a fluid product having an 8 inch to 10 inch slump at time of placement. The Contractor shall submit a mixture design for approval supported by laboratory test data verifying compliance with 28 day compressive strength requirements. Mix design shall be approved by the Owner prior to placement.
  - i) **Procedures:** Mixing and transporting shall be in accordance with the City of Huntsville Standard Design Specifications or by other methods approved by the Owner.
  - j) Temperature of backfill shall be at least 50 degrees Fahrenheit at time of placement. Material shall be protected from freezing for 24 hours after placement.
  - k) When used as backfill for pipe and floatation or misalignment occurs, correct alignment of the pipe culvert shall be assured by means of straps, soil anchors or other approved means of restraint.

- c. For temporary measures the Class I material may be brought up to the existing pavement surface. A slight mound may be left if, in the opinion of the Owner or

Owner's Representative, the public would not be inconvenienced. Extreme care shall be exercised to prevent damage to the pipe during the backfilling operation.

3. **Remainder of Trench:** The remainder of the trench (above the zone around the pipe) shall be compacted by tamping as shown on the Standard Details. If the material is to be compacted by tamping or, under appropriate circumstances, rolling, the material shall be deposited and spread in uniform, parallel layers. Before the next layer is placed, each layer shall be tamped as required so as to obtain a thoroughly compacted mass. Care shall be taken that the material close to the bank, as well as in all other portions of the trench, is thoroughly compacted. When the trench width and the depth to which backfill has been placed are sufficient to make it feasible and it can be done effectively and without damage to the pipe, backfill may, on approval, be compacted by the use of suitable rollers, tractors, or similar powered equipment instead of by tamping. For compaction by tamping (or rolling), the rate at which backfilling material is deposited in the trench shall not exceed that permitted by the facilities for its spreading, leveling, and compacting as furnished by the Contractor. If necessary to ensure proper compaction by tamping (or rolling), the material shall first be wet by sprinkling. However, no compaction by tamping (or rolling) shall be done when the material is too wet either from rain or too great an application of water to be compacted properly; at such times, the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compacting, or such other precautions shall be taken as may be necessary to obtain proper compaction.
  4. **Miscellaneous Requirements:** Whatever method of compacting backfill is used, care shall be taken that stones and lumps shall not become nested and that all voids between stones shall be completely filled with fine material. Only suitable quantities of stone and rock fragments shall be used in the backfill. The Contractor shall, as part of the work done under the items involving earth excavation and rock excavation as appropriate, furnish and place all other necessary backfill material.
    - a. All voids left by the removal of sheeting shall be completely backfilled with suitable materials and thoroughly compacted.
    - b. Excavated material, which is acceptable to the Owner for surfacing or pavement subbase shall be placed at the top of the backfill to such depths as may be specified elsewhere or as directed. The surface shall be brought to required grade and stones raked out and removed.
  5. **Class I – Backfill limitations –** Crushed stone or ALDOT # 78 stone shall be limited to the dimensions specified on the Standard Details for payment purposes.
  6. A sufficient amount of Class II material shall be stockpiled to insure immediate replacement by the Contractor of any settled areas.
- C. Place backfill on subgrades free of mud, frost, snow, or ice.
  - D. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
  - E. Trenches under Roadways: Provide trenches under roadways in accordance with the Standard Details included in the Drawings.
  - F. Backfill voids with satisfactory soil while removing shoring and bracing.

- G. Place and compact initial backfill of subbase material free of particles larger than 1 inch (25 mm) in any dimension, to a height of 12 inches (300 mm) over the pipe or conduit.
  - 1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- H. Place and compact final backfill of satisfactory soil to final subgrade elevation.
- I. Install warning tape directly above utilities as required in Section 330000 "Pipe and Fittings."

### 3.15 BACKFILL UNDER FOUNDATION ELEMENTS (i.e., base slabs)

- A. All backfill under foundation elements shall consist of granular structural fill as herein defined.

### 3.16 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
  - 1. Under grass and planted areas, use satisfactory soil material.
  - 2. Under walks and pavements, use satisfactory soil material.
  - 3. Under steps and ramps, use engineered fill.
  - 4. Under building slabs, use engineered fill.
  - 5. Under footings and foundations, use engineered fill.
- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

### 3.17 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
  - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
  - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.
  - 3. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface or subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
  - 4. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

5. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by dicing, harrowing, or pulverizing until moisture content is reduced to the optimum moisture for compaction.

### 3.18 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698
  1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at 95 percent.
  2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 92 percent.
  3. Under turf or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 85 percent.
  4. For utility trenches, compact each layer of initial and final backfill soil material at 85 percent.
- D. Control soil compaction during construction providing minimum percentage of density specified for each area classification indicated below.
  1. Granular structural fill under foundation elements, i.e., footings and base slabs for manholes and vaults shall be compacted to 100% Standard Proctor Density, at a moisture content between 2 percent below to 3 percent above the optimum moisture content.
  2. Native soils used as fill under foundation elements shall be placed in maximum eight-inch loose lifts and compacted to a minimum dry density of 100% of the Standard Proctor density at a moisture content between 2 percent below to 3 percent above the optimum moisture content.
- E. Place backfill and fill materials evenly adjacent to structures, piping, or conduit to required elevations. Take care to prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping, or conduit to approximately same elevation in each lift. All backfill and fill materials shall be compacted per Standard Details.
- F. Foundation Systems-Manhole & Vault
  1. Soil Bearing Foundation Systems: All Structures shall be designed assuming their foundation elements would bear on a minimum of one foot of compacted granular structural fill to native soil.
  2. If rock is encountered while excavating for soil bearing foundation elements, the rock shall be undercut to a minimum of two (2) feet below the bearing elevation. The area

shall then be backfilled with compacted soil fill and ALDOT No. 78 stone as approved by Owner or Owner's Representative.

3. Soil bearing foundation areas shall be stripped of all vegetation, topsoil, soft soils, organic matter and other deleterious material. The stripped area shall extend two (2) feet outside the foundation limits. Areas receiving fill shall be brought to subgrade elevation with compacted-engineered fill. The last 12" of fill under slabs on grade shall be No. 78 stone. Fill shall be placed and compacted in accordance with these specifications.
  4. The excavation for all slabs on grade shall be undercut a minimum of 12 inches (or as shown on the Standard Details). The area under the slab shall be brought to grade with a 12 inch of ALDOT No. 78 stone.
  5. Care shall be exercised to ensure that the foundation bearing soils do not experience changes in moisture content.
  6. Foundation excavation, proofrolling, backfilling and compaction work shall be performed under the supervision of a professional geotechnical engineer.
- G. **Reconditioning Compacted Areas:** Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.

### 3.19 GRADING

- A. **General:** Uniformly grade areas within limits of grading under this Section, including adjacent transition areas to a smooth surface, free of irregular surface changes. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
1. Provide a smooth transition between adjacent existing grades and new grades.
  2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. **Site Rough Grading:** Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
1. Turf or Unpaved Areas: Plus or minus 1 inch (25 mm).
  2. Walks: Plus or minus 1 inch (25 mm).
  3. Pavements: Plus or minus 1/2 inch (13 mm).
- C. **Grading inside Building Lines:** Finish subgrade to a tolerance of plus or minus 1/2 inch (13 mm) when tested with a 10-foot (3-m) straightedge.

### 3.20 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:

1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
2. Place base course material over subbase course under hot-mix asphalt pavement.
3. Shape subbase course and base course to required crown elevations and cross-slope grades.
4. Place subbase course and base course 6 inches (150 mm) or less in compacted thickness in a single layer.
5. Place subbase course and base course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
6. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

### 3.21 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

- A. Place drainage course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:
  1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
  2. Place drainage course 6 inches (150 mm) or less in compacted thickness in a single layer.
  3. Place drainage course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
  4. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

### 3.22 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
  1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
  2. Determine that fill material and maximum lift thickness comply with requirements.
  3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.
  4. Compaction of soil backfills and fills require Contract compaction testing in accordance with ANSI/ASTM D1556 or ANSI/ASTM D2292 and under provisions of Section 14000 – Quality Requirements.
  5. If tests indicate work does not meet specified requirements, remove work, replace and retest at no additional cost to the Owner.
- B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

- C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Owner.
- E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
  - 1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
  - 2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length, but no fewer than two tests.
  - 3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length, but no fewer than two tests.
- F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.
- G. Quality Control Testing During Construction: Allow the Geotechnical Engineer to inspect and report to the Owner or Owner's Representative on findings and approve sub-grades and fill layers before further construction work is performed. Perform field density tests in accordance with ASTM D 1556 (sand cone method), ASTM D 2167 (rubber balloon method), or ASTM D 2992 (nuclear density method), as applicable and at a frequency necessary to be reasonably assured that adequate compaction is achieved.
- H. If in the opinion of the Owner or Owner's Representative, based on testing service reports and inspection, subgrade or fills, which have been placed are below specified density, the Contractor shall provide additional compaction and testing at no additional expense to the Owner.

### 3.23 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
  - 1. Scarify or remove and replace soil material to depth as directed by Owner; reshape and recompact.
- C. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, or other finish), add backfill material, compact, and

replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

### 3.24 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.
- B. Disposal of Excess Non-Organic Soil and Rock: All excess excavated material shall become the property of the Contractor and shall be disposed by him outside the project limits. It is the Contractor's responsibility to locate a suitable legal waste area off-site, obtain necessary permits or use of the waste area and be in compliance with applicable laws and regulations.

END OF SECTION 31 30 00

## **SECTION 31 40 00 - TUNNELING, BORING AND JACKING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.**

#### **1.2 SUMMARY**

- A. Section includes tunneling, boring and jacking requirements for forcemain piping and appurtenances.**
- B. Related Sections:**
  - 1. Division 01 Section "Project Management and Coordination" for recording preexisting conditions and project management requirements.**
  - 2. Division 31 Section "Earth Moving" for excavating, backfill and compaction requirements.**
  - 3. Division 33 Section "Pipe and Fittings" for pipe and appurtenances requirements.**

#### **1.3 SUBMITTALS**

- A. The Contractor shall submit to the Owner details of the procedure proposed for work, along with a description of the equipment available for use.**
- B. Tunnel support systems shall be with steel liner plates, ribs and lagging, steel casing pipe or other systems approved by the Owner or Engineer. The Contractor shall furnish a detailed Tunneling Plan for review by the Owner or Engineer. The plans shall contain a description of the tunneling method and equipment proposed, tunnel support system, shop drawings, details and cross-sections, a schedule of operations, and the proposed work hours. Tunnel construction shall not commence until the Owner or Engineer has reviewed the submittal and provided approval of plan. The Owner or Engineer's approval shall in no way relieve the Contractor of the sole responsibility for the execution of this work or any liability. When tunnel construction occurs under the Alabama Department of Transportation or any applicable Railway Corporation right of ways or under a stream belonging in the Corps of Engineer's jurisdiction, the tunneling plan shall also be subject to the approval of the governing agency.**
- C. Boring and jacking support systems shall be with steel casing pipe or other systems approved by the Owner or Engineer. The Contractor shall furnish a detailed Boring and Jacking Plan for review by the Owner or Engineer. The plans shall contain a description of the Boring and Jacking method and equipment proposed, boring and jacking support system, shop drawings, details and cross-sections, a schedule of operations, and the proposed work hours. Boring and Jacking construction shall not commence until the Owner or Engineer has reviewed and approved the submittal. The Owner or Engineer's approval shall in no way relieve the**

Contractor of the sole responsibility for the execution of this work or any liability. When boring and jacking occurs under the Alabama Department of Transportation or any applicable Railway Corporation right of ways or under a stream belonging in the Corps of Engineers jurisdiction, the Boring and Jacking Plan shall also be subject to the approval of the governing agency.

#### 1.4 WORK INCLUDED

- A. Boring and jacking.
- B. Installation of encasement pipe.
- C. Encasement pipe protection.

#### 1.5 QUANTITIES

- A. All excavation is bid as unclassified. No separate payment for excavation of any kind, including rock removal, will be made.

#### 1.6 REFERENCES

- A. ANSI B16.5
- B. State of Alabama Department of Transportation (formerly Highway Department) Standard Specifications.
- C. Alabama Department of Transportation (formerly Highway Department) Utility Manual.

### PART 2 - MATERIALS

#### 2.1 STEEL TUNNEL LINER PLATES

- A. The base metal for steel plates shall conform to the chemical requirements of ASTM A569, Standard Specification for Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip, Commercial Quality. The flat plate (before cold forming) shall conform to the following minimum mechanical properties:
  - 1. Tensile Strength            42,000 psi
  - 2. Yield Strength             28,000 psi
  - 3. Elongation, 2 inches     30%
- B. Nominal plate dimensions shall provide the sectional properties shown in the current edition of the AASHTO Standard Specifications for Highway Bridges. Thickness tolerances shall conform to Paragraph 14 of AASHTO M167, Standard Specification for Structural Plate for Pipe, Pipe-Arches, and Arches. Steel liner plates shall be of additional thickness or protected by coatings and other means when required in the contract for resistance to abrasion or corrosion.

**2.2 STEEL CASING PIPE**

- A. Steel casing pipe shall conform to ASTM A139, Standard Specification for Electric-Fusion (ARC) Welded Steel Pipe. For 24 inch and greater diameter casing pipe, a minimum clearance of 10 inches (total) must be provided between pipe bells and the inside of the casing pipe, except as otherwise stated in these Specifications, or as shown on the Drawings.
- B. The steel pipe shall be new material, with a minimum yield strength of 35,000 psi in accordance with ASTM A-139, grade B. Pipe shall have plain ends.
- C. Steel shall comply with the appropriate requirements for the size shown in the following table and approved by the Owner or Engineer.

| <b>Pipe Diameter* Inches</b> | <b>Minimum Casing Diameter Inches</b> | <b>Minimum Wall Thickness Inches</b> |
|------------------------------|---------------------------------------|--------------------------------------|
| 8                            | 18                                    | 0.250                                |
| 12                           | 24                                    | 0.250                                |
| 18                           | 30                                    | 0.312                                |
| 20                           | 30                                    | 0.312                                |
| 24                           | 36                                    | 0.375                                |
| 42                           | 54                                    | 0.500                                |
| 48                           | 60                                    | 0.625                                |

\*Minimum casing diameter shall be obtained by adding 10-inches to carrier pipe diameter and then rounding up to the next available steel pipe diameter. Consult steel casing manufacturer for the minimum wall thickness and obtain approval from Owner or Engineer.

**2.3 BOLTS AND NUTS**

- A. Bolts and nuts used with lapped seams shall be no less than 5/8 inch in diameter. The bolts shall conform to ASTM A449, Standard Specification for Quenched and Tempered Steel Bolts and Studs, for plate thicknesses equal to or greater than 0.209 inch and A307, Standard Specification for Carbon Steel Externally Threaded Standard Fasteners, for plate thickness less than 0.209 inch. The nut shall conform to ASTM A307, Grade A.
- B. Bolts and nuts used for 4-flanged plates shall be no less than 1/2 inch in diameter for plate thicknesses to and including 0.179 inch and no less than 5/8 inch in diameter for plates of greater thickness. The bolts and nuts shall be quick acting coarse thread and shall conform to ASTM A307, Grade A.

**2.4 CEMENT GROUT FOR FILLING VOIDS OUTSIDE OF TUNNEL PLATES OR CASING PIPE**

- A. Cement grout for filling voids outside tunnel liner plates and 24 inch and larger casing pipe, unless shown otherwise on the Drawings, shall consist of a mixture of water and one part Type 1 Portland Cement to two parts mortar sand by volume. The water shall be adjusted to produce a

mixture of consistency suitable for pumping, with a minimum slump of 5 inches and a maximum slump of 9 inches. Provisions shall be made for releasing of air and filling with grout. A pressure of 10 to 15 PSI shall be used.

## 2.5 SPACERS BETWEEN CARRIER PIPE AND CASING PIPE

- A. Stainless Steel Spacers provided by "Cascade Waterworks MFG" or approved equal shall be used for securing the carrier pipe within the encasement pipe. Spacers shall conform to manufacturer's standard specifications for placement and separation providing proper support and strengthening of the carrier pipe. All details of proposed procedures for supplying and placement shall be provided to the Owner for approval prior to construction. This shall be considered part of the pay item for sewer pipe installation by tunneling or boring and jacking.

## 2.6 CASING END SEALS

- A. Casing End Seals as manufactured by the CASCADE System or approved equal shall be used to seal off each end of the casing pipe preventing backfill debris and seepage from entering the casing pipe. The seal shall be manufactured of virgin SBR. Stainless Steel bands shall be used to connect the end seal to the casing pipe and carrier pipe. The Owner or Engineer shall approve the installation.

## 2.7 CEMENT GROUT

- A. Cement grout for filling voids outside tunnel liner plates and 24 inch and larger casing pipe, unless shown otherwise on the Drawings, shall consist of a mixture of water and one part Type 1 Portland Cement to two parts mortar sand by volume. The water shall be adjusted to produce a mixture of consistency suitable for pumping, with a minimum slump of 5 inches and a maximum slump of 9 inches. Provisions shall be made for releasing of air and filling with grout. A pressure of 10 to 15 PSI shall be used. Cement grout for filling the voids between the carrier and casing pipe shall be a mixture suitable for grouting and shall be approved by the Owner prior to its use.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Pipe shall be constructed by boring and jacking only at those locations and within limits shown on the Drawings or as directed by the Owner. Where pipe is required to be installed under railroads, highways, streets, or other facilities by boring and jacking, construction shall be made according to the Drawings, Specifications, and permit requirements in such a manner that will not interfere with the operation of the railroad, street, highway, or other facility, and shall not weaken or damage any embankment or structure.
- B. If any utility above or adjacent to the bore is endangered or has been damaged because of the boring and jacking operations or movements of earth caused by such operations, the owner of

same shall be notified immediately and shall be given access to the work to carry out all necessary repairs to such utilities. All repair costs are the responsibility of the Contractor.

- C. The Contractor shall be responsible for protection of utilities, sewers, and drains against damage by the work. If any public or private property is endangered, or has been damaged as a direct result of the boring and jacking operations, it shall be repaired at the Contractor's expense. All cost and expense to the Contractor for carrying out the above requirements shall be considered to be included in the lump sum bid prices for the completed forcemain installation.

### 3.2 TUNNELING INSTALLATION

- A. All work shall conform to 29 CFR, Part 1926, Subpart S, "Tunneling".

- 1. Work hours must be approved by the Owner as part of the construction schedule submittal. Tunnel construction operations may progress for 24 hours a day, except on Sundays. When work is done at night, the Contractor shall provide adequate safety precautions such as watchmen, barricades, lights, etc., and any mechanical equipment used in the construction operations shall be of a type that produces a minimum amount of noise to avoid creating a nuisance.

- B. Tunnel Shafts

- 1. Shafts shall be constructed at the locations shown on the Drawings. If not shown on the Drawings, shafts shall be constructed at locations selected by the Contractor, subject to approval by the Owner or Engineer. Temporary construction shafts shall be of adequate size and properly constructed and equipped to meet all requirements of safety to personnel and to the work. All shafts shall be barricaded, lighted, fenced, and properly guarded from the beginning of the excavation until the completion of the construction requiring the shaft. A substantially constructed ladder shall be provided in each shaft and shall be kept in safe, good repair and clean and clear of debris.
- 2. Provisions shall be made at each shaft so that plumb lines suspended on the centerline of the sewer at each end of the shaft will hang freely from the surface.

- C. Tunnel Construction

- 1. The Contractor shall carry out the work of tunneling and supporting the tunnel face, roof, walls, and floor so that there will be no fall, flow, caving, or heaving of earth or other materials into the tunnel excavation. If there should be any fall or movement of earth into the tunnel at any time, the Contractor shall proceed with the work with all necessary precautions and in such a manner as will ensure the safety of life and of all pipe, utilities and public and private property above and adjacent to the tunnel.
- 2. The Contractor shall furnish, place and maintain all sheeting, bracing or lining required to support the tunnel floor, roof, sides, and face until the pipe and its bedding, jointing, encasement and backfilling have been completed. All liners shall remain in place. Care shall be used in trimming the surfaces of the excavated section and in placing the liners or sheeting and bracing so that the required minimum clearance between the outside of the pipe and the final position of the liners, sheeting and bracing in the tunnel will be attained without any deviation in sewer alignment. Sheeting or lining must be placed and held tightly against the trimmed earth surface of the excavated section so that complete filling

of voids may be achieved between the earth and the lining or sheeting placed against it. No part of the lining, bracing, or flanges of steel liner plates shall project closer to the outside top of the pipe than 12 inches, or to the outside bottom of the pipe than 4 inches, unless shown otherwise on the Drawings.

**D. Prevention of Loss of Earth Materials**

1. Cavities or spaces between the actual surfaces of excavation and the tunnel liner plates or sheeting, shall be completely filled with cement grout. Grout shall be placed under pressure through grout nipples in the steel liner plates or grout holes in sheeting. The grout holes shall be at minimum 10 feet centers and the grout placed in such sequence as to ensure the complete filling of all cavities and spaces and of carrying loads uniformly from the undisturbed material to the tunnel lining or sheeting. Grouting shall be done at frequent intervals simultaneously with the tunnel construction and immediately whenever a loss of material occurs. In no case should the tunnel be left ungrouted if work is to be stopped or suspended for any extended period of time. Refer to paragraph D.4 of this Section.
2. At the end of each working day, or whenever a delay in the tunneling is anticipated, the Contractor shall construct a bulkhead to prevent the caving of soil at the working face. The bulkhead shall be required unless the Owner or Engineer specifically grants permission to omit the bulkhead.
3. Wherever unstable conditions are encountered and the Contractor is unable to proceed without loosening earth or creating voids outside the tunnel lining, the Contractor shall presolidify the soil around the area to be excavated by freezing the soil or injecting an approved chemical that will permit the tunnel excavation to proceed without any loss of earth material, or other method approved by the Owner or Engineer. Before any stabilization of earth materials is begun, the Contractor shall obtain approvals.

**E. Installation of Carrier Pipe in Tunnels**

1. All pipe used in tunnels shall be of the type shown on the Drawings or in the Specifications and shall be of the size and strength class required.
2. After the tunnel section is excavated, lined, and braced, the carrier pipe shall be placed on and supported by steel rails, a concrete pad, or other approved supports. The supporting system shall assure line and grade and shall allow sufficient space below the pipe for placing concrete. Care shall be used to avoid damage to the pipe or to the liner plates. The carrier pipe shall be rigidly braced to prevent its displacement during construction installation.
3. End seals as specified shall be used to seal off the space between the carrier pipe and sides of the roof of the tunnel.
4. Temporary shafts shall be completely abandoned. Unless otherwise specified in the Drawings or Specifications, all sheeting, bracing, and similar items may be removed unless the Contractor requests and receives authorization from the Owner or Engineer to leave it in place.

### 3.3 BORING AND JACKING INSTALLATION

#### A. Boring and Jacking Equipment and Construction

1. When required by the Drawings, sewers shall be constructed within steel casing pipe that has been jacked or pushed into bored holes. The holes shall be bored from the low or downstream end, unless site conditions dictate otherwise and the Owner or Engineer provides approval.
2. The access pit shall be of sufficient size to provide ample working space for the boring and jacking equipment, guide rails, reaction blocks, bracing, spoil removal, and sections of pipe as required. Provisions shall be made for the erection of guide rails in the bottom of the pit by providing a crushed stone base where applicable. The Contractor shall be responsible for providing stable foundation and wall supports during boring operations.
3. The boring and jacking machine to be used shall be in good mechanical condition and capable of advancing the bore hole within the required limits of accuracy. All cutting heads shall be removable without retracting the casing pipe. Backstops and guide rails shall be of sufficient strength and rigidity to support the thrust of the boring and jacking machine without displacement. Guide rails shall be accurately laid to line and grade and maintained in this position until completion of the boring and jacking operation. A smooth casing pipe of sufficient strength and diameter shall be forced into the bored hole to provide a tight fit against the earth sides of the bore hole. The casing pipe shall be of minimum diameters as specified in this section. Joints between sections of the casing pipe shall be welded with a continuous circumferential weld. Following installation, the casing pipe shall be carefully inspected to ensure that the carrier pipe can be properly placed.
4. During placement of the carrier pipe in the casing, the carrier pipe shall be blocked or otherwise supported to secure the proper flow line elevations throughout its full length. The carrier pipe shall be placed in the casing pipe only by such method that will keep the pipe joints in compression. Any method tending to unjoint the pipe while being placed will not be permitted. End seals shall be used to seal off each end of the casing pipe. Before installing the end seals, the exterior of the casing pipe shall be grouted on 10 feet centers and the carrier pipe shall be carefully inspected for uniformity of grade along its alignment and any required corrections shall be made. Particular attention shall be given to ensuring that the pipe will be solidly supported by grout at its bottom and sides. The method of injection of grout under mechanical pressure shall be approved by the Owner or Engineer. Grout shall be placed by filling the exterior of the casing pipe, through 4 inch diameter holes placed on 10 feet centers, beginning at the downstream end and proceeding upstream.
5. The Owner shall approve selection of steel casing spacers.
6. When unforeseen obstructions or conditions require abandonment of a partially completed bore hole, plug end of pipe by filling with grout. Then the Contractor shall backfill the abandoned bore hole and start a new hole. The Contractor shall receive no compensation for any expenses incurred by any unsuccessful attempt.

### 3.4 DEWATERING

- A. Prior to commencing, the Contractor shall furnish and operate all necessary pumping equipment of ample capacity and make all necessary provisions to keep shafts and pits free of water during construction and to satisfactorily dispose of such water. During placing of concrete, drainage and pumping shall be so arranged that concrete is placed in the dry and that no water will flow over the concrete until it has hardened.

**3.5 LINE AND GRADE**

- A. Line and grade shall be checked frequently by the Contractor's Professional Land Surveyor and not less than once per day. Results from these checks shall be provided to the Owner. The Contractor also shall assist the Owner in checking line and grade as often as the Owner deems necessary to ensure that proper tolerances in line and grade are being met.**
- B. Bored and jacked sections of pipe shall be completely installed prior to construction of adjoining sections. If permitted by the Owner, minor adjustments in the line and/or grade of the adjoining sections shall be allowed to compensate for slight deviations from the Drawing line and grade of the installed tunneled sections.**

**3.6 WATERPROOFING**

- A. After installation of the carrier pipe within the encasement or tunnel pipe, the ends of the casing or tunnel shall be sealed with brick and mortar until a tight seal is obtained.**

**3.7 CONTRACTORS LIABILITIES**

- A. The cost of repairing any damage which is caused by the boring operation to the highway above the bore shall be borne by the Contractor.**

**END OF SECTION 31 40 00**

## SECTION 31 50 00 - EXCAVATION SUPPORT AND PROTECTION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes temporary excavation support and protection systems.
- B. Related Sections:
  - 1. Division 01 Section "Temporary Facilities and Controls" for temporary utilities and support facilities.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Design, furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure and superimposed and construction loads.
  - 1. Delegated Design: Design excavation support and protection system, signed and sealed by a qualified professional engineer registered in the State of Alabama, using performance requirements and design criteria indicated.
  - 2. Prevent surface water from entering excavations by grading, dikes, or other means.
  - 3. Install excavation support and protection systems without damaging existing buildings, structures, and site improvements adjacent to excavation.
  - 4. Monitor vibrations, settlements, and movements.

#### 1.4 SUBMITTALS

- A. Shop Drawings: For excavation support and protection system.
- B. Delegated-Design Submittal: For excavation support and protection system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Coordinate first paragraph below with qualification requirements in Division 01 Section "Quality Requirements." Qualification Data: For qualified professional engineer.
- D. Other Informational Submittals:

1. **Photographs or Videotape:** Show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by the absence of, the installation of, or the performance of excavation support and protection systems. Submit before Work begins.
2. **Record Drawings:** Identifying and locating capped utilities and other subsurface structural, electrical, or mechanical conditions.
  - a. Note locations and capping depth of wells and well points.

## 1.5 PROJECT CONDITIONS

- A. **Interruption of Existing Utilities:** Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:
  1. Do not proceed with interruption of utility without Owner's written permission.
- B. **Project-Site Information:** A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from the data.
  1. Make additional test borings and conduct other exploratory operations necessary for excavation support and protection.
  2. The geotechnical report is included as an appendix to the Contract Specifications.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. **General:** Provide materials that are either new or in serviceable condition.
- B. **Structural Steel:** ASTM A 36/A 36M, ASTM A 690/A 690M, or ASTM A 992/A 992M.
- C. **Steel Sheet Piling:** ASTM A 328/A 328M, ASTM A 572/A 572M, or ASTM A 690/A 690M; with continuous interlocks.
  1. **Corners:** Roll-formed corner shape with continuous interlock.
- D. **Tiebacks:** Steel bars, ASTM A 722/A 722M.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.**
  - 1. Shore, support, and protect utilities encountered.**
- B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.**
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.**
- C. Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces are not impeded.**
- D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.**
- E. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.**

### **3.2 SHEET PILING**

- A. Before starting excavation, install one-piece sheet piling lengths and tightly interlock to form a continuous barrier. Accurately place the piling, using templates and guide frames unless otherwise recommended in writing by the sheet piling manufacturer. Limit vertical offset of adjacent sheet piling to 60 inches (1500 mm). Accurately align exposed faces of sheet piling to vary not more than 2 inches (50 mm) from a horizontal line and not more than 1:120 out of vertical alignment. Cut tops of sheet piling to uniform elevation at top of excavation.**

### **3.3 TIEBACKS**

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

### **3.4 BRACING**

- A. Bracing: Locate bracing to clear columns, floor framing construction, and other permanent work. If necessary to move brace, install new bracing before removing original brace.**
  - 1. Do not place bracing where it will be cast into or included in permanent concrete work unless otherwise approved by Engineer.**
  - 2. Install internal bracing, if required, to prevent spreading or distortion of braced frames.**
  - 3. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.**

### **3.5 REMOVAL AND REPAIRS**

- A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.**
  - 1. Remove excavation support and protection systems to a minimum depth of 48 inches (1200 mm) below overlaying construction and abandon remainder.**
  - 2. Fill voids immediately with approved backfill compacted to density specified in Division 31 Section "Earth Moving."**
  - 3. Repair or replace, as approved by Engineer, adjacent work damaged or displaced by removing excavation support and protection systems.**
- B. Leave excavation support and protection systems permanently in place.**

**END OF SECTION 31 50 00**

## **SECTION 31 60 00 - ROUGH GRADING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.**

#### **1.2 SUMMARY**

##### **A. Section Includes:**

- 1. Rough Grading**
- 2. Temporary erosion and sedimentation control measures.**

##### **B. Related Sections:**

- 1. Division 01 Section "Temporary Facilities and Controls" for temporary utility services, construction and support facilities, security and protection facilities.**
- 2. Division 01 Section "Execution" for field engineering and surveying.**
- 3. Division 31 Section "Site Clearing" for site clearing requirements.**
- 4. Division 31 Section "Earth Moving" for earthwork requirements.**
- 5. Division 31 Section "Finish Grading" for finish grading requirements.**
- 6. Division 32 Section "Site Restoration" for site restoration requirements.**

##### **C. Remove topsoil and stockpile for later reuse.**

##### **D. Excavate subsoil and stockpile for later reuse as directed in Section 31 30 00 "Earth Moving".**

##### **E. Grade and rough contour site.**

#### **1.3 PROJECT RECORD DOCUMENTS**

- A. Accurately record location of utilities remaining, rerouted utilities, new utilities by horizontal dimensions, elevations or inverts, and slope gradients per Division 00 - General Conditions, City of Huntsville Supplement to General Requirements for Construction of Public Improvements.**

#### **1.4 PROTECTION**

- A. Protect trees and other features remaining as portion of final landscaping.**
- B. Protect bench marks, existing structures, fences, roads, sidewalks and other features not designated for demolition.**

- C. Protect above or below grade utilities which are to remain.
- D. Contractor shall be responsible to repair any damage to those items not designated for demolition or removal in a manner satisfactory to the Owner at no additional cost to the Owner.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Topsoil: Excavated material, graded free of roots, rocks larger than one inch, subsoil, debris, and large weeds.
- B. Subsoil: Excavated material, graded free of lumps larger than 12 inches, rocks larger than 12 inches, and debris.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Identify required lines, levels, contours, and datum. Identify known below grade utilities. Stake and flag locations. Identify and flag above grade utilities. Maintain and protect existing utilities remaining which pass through work area. Upon discovery of unknown utility or concealed conditions, discontinue affected work and notify Owner.

### 3.2 TOPSOIL EXCAVATION

- A. Excavate topsoil from areas to be further excavated, and stockpile in area designated on site by the Owner. Do not excavate wet topsoil. Stockpile topsoil to depth not exceeding 8 feet.

### 3.3 SUBSOIL EXCAVATION

- A. Excavate subsoil from indicated areas and stockpile in area designated on site. Excess subsoil may be reused according to Section 31 30 00, "Earth Moving".
- B. Do not excavate wet subsoil.
- C. Stockpile subsoil to height not exceeding 8 feet.
- D. When excavation in roots is necessary, perform work by hand and cut roots with a sharp axe.

### 3.4 TOLERANCES

- A. Top Surface of Subgrade: Plus or minus three (3) inches.

**END OF SECTION 31 60 00**

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## SECTION 31 70 00 - FINISH GRADING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

##### A. Section Includes:

1. Finish Grading
2. Temporary erosion and sedimentation control measures.

##### B. Related Sections:

1. Division 01 Section "Quality Requirements" for quality assurance and quality control requirements.
2. Division 01 Section "Temporary Facilities and Controls" for temporary utility services, construction and support facilities, security and protection facilities.
3. Division 01 Section "Execution" for field engineering and surveying.
4. Division 31 Section "Site Clearing" for site clearing requirements.
5. Division 31 Section "Earth Moving" for earthwork requirements.
6. Division 31 Section "Rough Grading" for finish grading requirements.
7. Division 32 Section "Site Restoration" for site restoration requirements.

- C. This section includes all sites of the Project. These criteria are to be considered a minimum and the Contractor is required to provide both labor and material needed to bring commercial and residential areas back to a state essentially equivalent to or better than that before construction. Necessary measure and material may include, but are not limited to shrubbery, trees, sod, fencing, pavement repair and repair of or compensation for any damage which construction activities may cause to any public or private property.

1. Remove topsoil and stockpile for later reuse.
2. Excavate subsoil and stockpile for later reuse as directed in Section 31 30 00 "Earth Moving".
3. Grade and rough contour site.
4. Finish grade subsoil.
5. Place, level, and compact topsoil.

#### 1.3 PROTECTION

- A. Protect landscaping and other features remaining as final work.

- B. Protect existing structures, fences, roads, and paving.

#### 1.4 PROJECT RECORD DOCUMENTS

- A. Submit documents under provisions of Division 00 - General Conditions, City of Huntsville Supplement to General Requirements for Construction of Public Improvements.
- B. Accurately record location of utilities remaining, rerouted utilities, new utilities by horizontal dimensions, elevations or inverts, and slope gradients.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Topsoil: Topsoil for all sites shall consist of excavated loamy soil reasonably free from hard lumps, stiff clay, hardpan, gravel and that which is otherwise suitable for supporting a stand of grass.

### PART 3 - EXECUTION

#### 3.1 INSPECTION

- A. Verify site conditions and note irregularities affecting work of this Section.
- B. Beginning work of this Section means acceptance of existing conditions.

#### 3.2 SUBSOIL PREPARATION

- A. Eliminate uneven areas and low spots. Remove debris, roots, branches and stones in excess of 1 inch in size. Remove subsoil contaminated with petroleum products.
- B. Scarify subgrade to depth of 3 inches where topsoil is scheduled. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

#### 3.3 PLACING TOPSOIL

- A. Place topsoil in areas where seeding is scheduled.
- B. Use topsoil in relatively dry state. Place during dry weather.
- C. Fine grade topsoil eliminating rough or low areas. Maintain levels, profiles, and contours of subgrade.
- D. Remove stone, roots, grass, weeds, debris, and foreign material while spreading.

- E. Manually spread topsoil around structures to prevent damage.
- F. Roll placed topsoil.
- G. Leave stockpile area and site clean and raked, ready to receive landscaping.

**3.4 TOLERANCES**

- A. Top of Topsoil: Plus or minus one (1) inch.

**3.5 SCHEDULE OF LOCATIONS**

- A. The compacted topsoil thickness for various locations for seeded grass is six (6) inches minimum.

**END OF SECTION 31 70 00**

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## SECTION 31 80 00 – SLOPE PROTECTION AND EROSION CONTROL

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
1. Slope protection for utility excavation.
  2. Temporary erosion and sedimentation control measures.
- B. Related Sections:
1. Division 01 Section "Quality Requirements" for quality assurance and quality control requirements.
  2. Division 01 Section "Temporary Facilities and Controls" for temporary utility services, construction and support facilities, security and protection facilities.
  3. Division 01 Section "Execution" for field engineering and surveying.
  4. Division 31 Section "Site Clearing" for site clearing requirements.
  5. Division 31 Section "Earth Moving" for earthwork requirements.
  6. Division 31 Section "Rough Grading" for finish grading requirements.
  7. Division 32 Section "Site Restoration" for site restoration requirements.
- C. The Contractor shall do all work and take all measures necessary to control soil erosion resulting from construction operations, shall prevent the flow of sediment from the construction site, and shall contain construction materials (including excavation and backfill) within a protected working area so as to prevent damage to adjacent property.
- D. The Contractor shall not employ any construction method that violates a rule, regulation, guideline or procedure established by Federal, State or local agencies having jurisdiction over the environmental effects of construction. The Contractor shall be responsible for obtaining all associated permits.
- E. Pollutants such as chemicals, fuels, lubricants, bitumen, raw sewage and other harmful waste shall not be discharged into or alongside of any body of water or into natural or man-made channels leading thereto.
- F. Unless otherwise required by the agencies involved, the Contractor shall make application for, obtain and pay for all licenses and permits necessary for the prosecution of the work and shall pay for all fees and charges in connection therewith. This requirement includes obtaining all necessary stormwater permits.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Temporary Slope Protection and Erosion Control: Bales may be hay or straw, and shall be reasonably clean and free of noxious weeds and deleterious materials. Filter fabric (silt fencing) for sediment traps shall be of suitable materials acceptable to the Owner. Filter fabric shall be supported by woven wire fencing. Wire fencing shall be a minimum of 14 gauge with a maximum of 6-inch mesh openings.
  - I. Permanent Slope Protection and Erosion Control: On slopes 2H:1V and steeper, and where shown on the Drawings, place Dumped Rock Fill with a 24 inch minimum thickness over non-woven geotextile filter fabric. Dumped Rock Fill shall conform to the AHD Construction and Material Specifications.

## PART 3 - EXECUTION

### 3.1 METHODS OF CONSTRUCTION

- A. The Contractor shall use any of the acceptable methods necessary to control soil erosion and prevent the flow of sediment to the maximum extent possible. These methods shall include, but not be limited to, the use of water diversion structures, diversion ditches and settling basins.
- B. Construction operations shall be restricted to the areas of work indicated on the Drawings and to the area which must be entered for the construction of temporary or permanent facilities. The Owner has the authority to limit the surface area of erodable earth material exposed by clearing and grubbing, excavation, borrow and fill operations and to direct the Contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of the wetlands and adjacent watercourses. Such work may involve the construction of temporary berms, bale barriers, dikes, dams, sediment basins, slope drains, surface roughing and use of temporary mulches, seeding, mats, or other control devices or methods as necessary to control erosion.
- C. Excavated soil material shall not be placed adjacent to the wetlands or watercourses in a manner that will cause it to be washed away by high water or runoff. Earth berms or diversions shall be constructed to intercept and divert runoff water away from critical areas. Diversion outlets shall be stable or shall be stabilized by means acceptable to the Engineer. All stockpiling of topsoil and backfill material shall be covered with mulch and/or seeding to prevent erosion of the stockpile material. If for any reason construction materials are washed away during the course of construction, the Contractor shall remove those materials from the fouled areas as directed by the Engineer.
- D. For work that requires stream crossings, clearing and excavation of the stream bed and banks shall be kept to the minimum needed in order to install appropriate stream crossing material. Temporary stream crossing structures may include spans, pipe culverts, or fords. The contractor shall remove all structures from the stream as soon as it is no longer necessary for project construction. Upon removal of the structure, the stream shall immediately be reshaped to its original cross-section and properly stabilized.

- E. For work within easements, all materials used in construction such as excavation, backfill, roadway, and pipe bedding and equipment shall be kept within the limits of the easements.
- F. The Contractor shall not pump silt-laden water from trenches or other excavations into the wetlands, or adjacent watercourses. Instead, silt-laden water from excavations shall be discharged within areas surrounded by baled hay or into sediment traps to ensure that only sediment-free water is returned to the watercourses. Damage to vegetation by excessive watering or silt accumulation in the discharge area shall be avoided.
- G. Prohibited construction procedures include, but are not limited to, the following:
  - 1. Dumping of spoil material into any streams, wetlands, surface waters or unspecified locations.
  - 2. Indiscriminate, arbitrary, or capricious operation of equipment in wetlands or surface waters.
  - 3. Pumping of silt-laden water from trenches or excavations into surface waters or wetlands.
  - 4. Damaging vegetation adjacent to or outside of the construction area limits.
  - 5. Disposal of trees, brush, debris, paints, chemicals, asphalt products, concrete curing compounds, fuels, lubricants, insecticides, washwater from concrete trucks or hydroseeders, or any other pollutant in wetlands, surface waters, or unspecified locations.
  - 6. Permanent or unauthorized alteration of the flow line of any stream.
  - 7. Open burning of debris from the construction work.
- H. Any temporary working roadways required shall be clean fill approved by the Owner. In the event fill is used, the Contractor shall take every precaution to prevent the fill from mixing with native materials of the site. All such foreign fill materials shall be removed from the site following construction.

### 3.2 EROSION CHECKS

- A. The Contractor shall furnish and install baled hay or straw erosion checks in all locations indicated on the Drawings, surrounding the base of all deposits of stored excavated material outside of the disturbed area, and where indicated by the Owner. Checks, where indicated on the Drawings, shall be installed immediately after the site is cleared and before trench excavation is begun at the location indicated. Checks located around stored material shall be located approximately 6 feet from that material. Bales shall be held in place with two 2 inch by 2 inch by 3 feet wooden stakes. Each bale shall be butted tightly against the adjoining bale to preclude short-circuiting of the erosion check. The wooden stakes shall extend into the ground at least 1-foot 6-inches. Each bale shall be placed a minimum of 4 inches below finished grade.

### 3.3 INSPECTION AND MAINTENANCE

- A. All forms of control devices used during the project shall be inspected by the Contractor on a weekly basis and after every rainfall event of one-half inch or more. Any needed repairs to control devices shall be made within 48 hours of the inspection.
- B. The Contractor shall submit to the Owner an erosion control maintenance schedule for maintaining all erosion and sedimentation locations. This schedule will be observed by the

**Engineer frequently throughout the duration of the project. The Owner will inspect this schedule weekly to verify maintenance of all control devices.**

**END OF SECTION 31 80 00**

## SECTION 32 92 00 - TURF AND GRASSES

### PART I - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:

- 1. Seeding
- 2. Sodding

- B. Related Sections:

- 1. Division 31 Section "Earth Moving" for excavation, filling and backfilling, and compaction requirements.
- 2. Division 32 Section "Site Restoration" for site restoration requirements.

#### 1.3 REFERENCES

- A. State of Alabama Department of Transportation (formerly Highway Department) Standard Specifications.
- B. Alabama Department of Transportation (formerly Highway Department) Utility Manual.

#### 1.4 DEFINITIONS

- A. **Duff Layer:** The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
- B. **Finish Grade:** Elevation of finished surface of planting soil.
- C. **Manufactured Topsoil:** Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- D. **Pesticide:** A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

- E. **Pests:** Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- F. **Planting Soil:** Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- G. **Subgrade:** Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.
- H. **Subsoil:** All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- I. **Surface Soil:** Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

#### 1.5 SUBMITTALS

- A. **Product Data:** For each type of product indicated.
  - 1. **Pesticides and Herbicides:** Include product label and manufacturer's application instructions specific to this Project.
- B. **Certification of Grass Seed:** From seed vendor for each grass-seed monostand or mixture stating the botanical and common name, 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.
- C. **Qualification Data:** For qualified landscape Installer.
- D. **Product Certificates:** For fertilizers, from manufacturer.
- E. **Maintenance Instructions:** Recommended procedures to be established by Owner for maintenance of turf during a calendar year. Submit before expiration of required initial maintenance periods.

#### 1.6 QUALITY ASSURANCE

- A. **Installer Qualifications:** A qualified landscape Installer whose work has resulted in successful turf establishment.
  - 1. **Professional Membership:** Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
  - 2. **Experience:** Five (5) years' experience in turf installation in addition to requirements in Division 01 Section "Quality Requirements."
  - 3. **Installer's Field Supervision:** Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.

4. **Personnel Certifications:** Installer's field supervisor shall have certification in one of the following categories from the Professional Landcare Network:
    - a. Certified Landscape Technician - Exterior, with installation, maintenance specialty area(s), designated CLT-Exterior.
    - b. Certified Turfgrass Professional, designated CTP.
    - c. Certified Turfgrass Professional of Cool Season Lawns, designated CTP-CSL.
  5. **Maintenance Proximity:** Not more than two (2) hours' normal travel time from Installer's place of business to Project site.
  6. **Pesticide Applicator:** State licensed, commercial.
- B. **Soil-Testing Laboratory Qualifications:** An independent laboratory or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. **Seed and Other Packaged Materials:** Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.
- B. **Sod:** Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod in time for planting within 24 hours of harvesting. Protect sod from breakage and drying.
- C. **Bulk Materials:**
  1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
  2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
  3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

#### 1.8 PROJECT CONDITIONS

- A. **Planting Restrictions:** Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of substantial completion.
- B. **Weather Limitations:** Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

## PART 2 - PRODUCTS

### 2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.
- B. Seed Species: State-certified seed of grass species as follows:
  - 1. Full Sun: Bermudagrass (*Cynodon dactylon*).
  - 2. Sun and Partial Shade: Proportioned by weight as follows:
    - a. 50 percent Kentucky bluegrass (*Poa pratensis*).
    - b. 30 percent chewings red fescue (*Festuca rubra* variety).
    - c. 10 percent perennial ryegrass (*Lolium perenne*).
    - d. 10 percent redtop (*Agrostis alba*).
  - 3. Refer to Alabama Department of Transportation (ALDOT) Standard Specifications Section 860 "Roadside Improvement Materials" (latest edition) for acceptable seed species.

### 2.2 SOD

- A. Turfgrass Sod: Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.
- B. Turfgrass Species: Bermudagrass (*Cynodon dactylon*)

### 2.3 ORGANIC SOIL AMENDMENTS

- A. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

### 2.4 FERTILIZERS

- A. 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: 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
  - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

## 2.5 MULCHES

- A. **Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.**

## 2.6 PESTICIDES

- A. **General: Pesticide, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.**

## PART 3 - EXECUTION

### 3.1 EXAMINATION

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

### 3.2 PREPARATION

- A. **Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.**
  - 1. **Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.**
  - 2. **Protect grade stakes set by others until directed to remove them.**
- B. **Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.**

### 3.3 TURF AREA PREPARATION

- A. Limit turf subgrade preparation to areas to be planted.
- B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 6-inches. Remove stones larger than 1-inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
- C. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch (13 mm) of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
- D. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- E. Before planting, obtain Owner's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

### 3.4 SEEDING

- A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph (8 km/h). Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
  - 1. Do not use wet seed or seed that is moldy or otherwise damaged.
  - 2. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.
- B. Rake seed lightly into top 1/8 inch (3 mm) of soil, roll lightly, and water with fine spray.
- C. Protect seeded areas with slopes exceeding 1:4 with erosion-control blankets installed and stapled according to manufacturer's written instructions.
- D. Protect seeded areas with erosion-control mats where shown on Drawings; install and anchor according to manufacturer's written instructions.
- E. Protect seeded areas from hot, dry weather or drying winds within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly, and roll surface smooth.

### 3.5 SODDING

- A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

1. Lay sod across angle of slopes exceeding 1:3.
  2. Anchor sod on slopes exceeding 1:6 with wood pegs spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.
- C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

### 3.6 TURF MAINTENANCE

- A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
  2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
  3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.
- B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches (100 mm).
1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
  2. Water turf with fine spray at a minimum rate of 1 inch (25 mm) per week unless rainfall precipitation is adequate.
- C. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:

### 3.7 SATISFACTORY TURF

- A. Turf installations shall meet the following criteria as determined by ENGINEER:
1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities.
- B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

**3.8 PESTICIDE APPLICATION**

- A. Apply pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.**

**3.9 CLEANUP AND PROTECTION**

- A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.**
- B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.**
- C. Remove nondegradable erosion-control measures after grass establishment period.**

**END OF SECTION 32 92 00**

## SECTION 32 95 00 - SITE RESTORATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

##### A. Section Includes:

- 1. Site Restoration requirements after completion of construction activities.

##### B. Related Sections:

- 1. Division 31 Section "Earth Moving" for excavation, bedding and backfilling, and compaction requirements.
- 2. Division 32 Section "Turf and Grasses" for site restoration requirements.

#### 1.3 CLEAN-UP

- A. Upon completion of the installation of the structures, yard piping, utilities, equipment and appurtenances, the Contractor shall remove all debris and surplus construction materials resulting from construction operations. The Contractor shall grade the ground along each side of the pipe trench and/or structure in a uniform and neat manner leaving the construction area in a shape as near as possible to the original ground line or to the grades shown on the Drawings.

### PART 2 - PRODUCTS

#### 2.1 SEEDING

- A. All graded areas shall be seeded as noted on the Drawings and as specified in Section 32 92 00.

#### 2.2 GRAVEL

- A. All gravel required to restore existing gravel drive shall be in like kind.
- B. Replacement of gravel drive shall require a minimum six (6) inch thick gravel layer.

## **PART 3 - EXECUTION**

### **3.1 SITE RESTORATION REQUIREMENTS**

- A. After installation of Work, the construction site shall be restored to its original condition or better. All paved streets, roads, sidewalks, curbs, etc. removed or disturbed during construction shall be replaced, and all materials and workmanship shall conform to standard practices and specifications of the Owner and/or to the Alabama Department of Transportation (Alabama Highway Department) requirements and specifications, whichever applies. Gravel, cinder or dirt streets, drives and shoulders shall be replaced and sufficiently compacted to provide a surface suitable for carrying the type of traffic normally imposed at that location.**
- B. All seeded areas shall be watered daily during the germination period, unless rain supplies the required moisture. The Contractor shall replace, at no additional cost to the Owner, trees, shrubs, etc. disturbed during construction.**
- C. The Contractor shall remove from the site all equipment, unused materials and other items. The construction site shall be left in a neat, orderly condition, clear of all unsightly items, before the Work is finally accepted.**

**END OF SECTION 32 95 00**

## SECTION 33 00 00 – PIPE AND FITTINGS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section

#### 1.2 SUMMARY

##### A. Section Includes:

1. Pipe.
2. Fittings.
3. Nonpressure and pressure couplings.
4. Manholes.
5. Testing Requirements.

##### B. Related Sections:

1. Division 31 Section "Earth Moving".
2. Division 33 "Manholes and Appurtenances".
3. Division 33 "Valves and Appurtenances".
4. Division 33 "Maintaining Wastewater Flow".
5. Division 33 "Television Inspection of Sanitary Sewers".

##### C. General Requirements:

1. This section shall cover all labor, materials, equipment and services required for furnishing and installing all new sanitary sewers, the connection of new sanitary sewers and forcemains to existing sanitary sewers and the testing of all sanitary sewer and forcemain lines. This work shall also include the furnishing and construction of joints, cutting, and connection to other pipes as may be required by the Drawings or directed to provide an acceptable facility. The piping specified in this section includes sanitary sewer gravity lines and forcemains. Sanitary sewer manholes are specified in Section 33 10 00. All sanitary sewer shall be constructed in accordance with the City of Huntsville, Engineering Department, "Design and Acceptance Manual for Sanitary Sewers".
2. Provide all labor, materials, equipment and services required for furnishing and installing all interior and exterior piping specified herein. Piping herein specified includes water, air, sludge, sanitary process, storm sewer, and sanitary sewer gravity lines and sanitary sewer forcemains. Refer to the pipe material schedule shown on the Drawings to determine which pipe materials are acceptable for each application. Replace all existing piping that interferes with installation of new pipe or that is damaged by new pipe installation in a manner approved by the Owner.

**D. Delivery, Storage and Handling Requirements**

1. Protect pipe, pipe fittings, and seals from dirt and damage.
2. Handle manholes according to manufacturer's written instructions.

**E. REFERENCES**

1. AWWA C104
2. AWWA C111
3. AWWA C151
4. AWWA C900
5. ASTM C443
6. ASTM C478
7. ASTM D1785 and D1784
8. ASTM D2467
9. ASTM D2564

**1.3 SUBMITTALS**

**A. Shop Drawings:**

1. Pipe material to meet requirements of this Section.
2. Manholes to meet requirements of Section 33 10 00 and include Drawings, elevations, sections, details, frames and covers.

**B. Field quality-control reports.**

**1.4 DELIVERY, STORAGE AND HANDLING**

- A. Protect pipe, pipe fittings, and seals from dirt and damage.
- B. Handle manholes according to manufacturer's written instructions.

**PART 2 - PRODUCTS**

**2.1 DUCTILE-IRON PIPE AND FITTINGS**

- A. All ductile iron pipe (DIP) shall be supplied in accordance with the requirements below and as required by the manufacturer. The Contractor shall be responsible for unloading of all pipe.
  1. The lining and coating for DIP shall meet the following requirements: The interior of the pipe and fittings shall be ceramic epoxy lined with Protecto-401 or approved equal in accordance with ASTM C868-02.
  2. Thicknesses of the lining shall be as recommended by pipe manufacturer, unless otherwise directed by the Owner or Owner's Representative. All approved linings shall meet the testing requirements of ASTM E-96-66, ASTM B-117, ASTM G-95 and ASTM D-714-87. Minimum thickness of the lining shall be 40 mils. All touch up and repair jobs shall be completed in accordance with manufacturer's recommendations.

3. The exterior of all pipe and fittings, unless otherwise specified, shall receive either coal tar or asphalt base coating with a minimum of 1 mil thick.
  4. Each piece of pipe shall bear the manufacturer's name or trademark, the year in which it was produced and the letters "DI" or word "DUCTILE". Pipe manufacturer shall furnish notarized certificate of compliance to the above AWWA or ANSI specifications.
  5. The cleaning and assembly of pipe and fitting joints shall be in accordance with the manufacturer's recommendations.
  6. Ductile iron pipe joint deflection angles shall not exceed 75% of the manufacturer's maximum allowance.
- B. All ductile iron pipe and fittings shall be new, unused pipe delivered directly from the manufacturer to the job site. Pipe, which has been stored by the Contractor for 3 months or longer, is not acceptable. All pipe must be approved by Owner or Owner's Representative prior to installation.
  - C. Note that ductile iron piping and push-on joint rubber gaskets will be furnished by the Owner. The Contractor shall be responsible for furnishing all other products and procedures, including bedding, backfill, manholes, concrete, and all other appurtenances required. Appurtenances include, but may not be limited to, all ductile iron bends, restrained joints (Megalug, or approved equal), all polyethylene wrap and all locate tape.
  - D. The Contractor shall be responsible for materials and encasing of all ductile iron pipe with polyethylene wrap in accordance with ANSI/AWWA-C105/A21.5. Eight (8) mil thick polyethylene shall be furnished in minimum flat width appropriate for the pipe diameter to be encased.
  - E. Ductile iron pipe for buried service shall be class and size as specified on Drawings.
  - F. Pipe fabricated for above ground service, with flanged joints, shall be fabricated in accordance with ANSI/AWWA C115/A21.15 and shall be Pressure Class 350 for up to and including 12 inches and Pressure Class 250 for pipe greater than 12 inches.
  - G. All ductile iron piping shall have a metallic tape laid 2 feet below finished grade. The tape shall be green in color to identify the pipe use and have the words "CAUTION SEWER SANITARY" printed on it. Product shall be Seton Name Plate Corp., New Haven, CT, No. 210, or equivalent.

## 2.2 DUCTILE IRON PIPE JOINT AND FITTINGS

- A. All items used for jointing pipe shall be furnished with the pipe and tested before shipment. The joints shall be made with tools and lubricant in strict conformity with the manufacturer's instructions. If requested, three (3) copies of such instructions shall be delivered to the Owner or Owner's Representative at start of construction.
- B. Push-in socket joints shall be equal to manufacturer's specifications for "Tyton," "Bell-Tite," or "Fastite." The joints shall consist of a rubber ring gasket compressed in groove in bell of pipe with beveled spigot end of pipe for initial centering into rubber gasket in bell and conform to ANSI/AWWA C111/A21.11.

- C. All ductile iron fittings shall be pressure rated 350 and shall be ductile cast iron grade per ASTM A536 with same interior and exterior coatings as the pipe.
- D. Mechanical joints shall be used where specifically called for on the Drawings. Mechanical joint restraints for ductile iron pipe are to be furnished according to ANSI/AWWA C111/A21.11. All pipe joints must be furnished complete with all accessories. Ductile iron mechanical restrained joints shall be Megalug Series 1100, or approved equal. Rubber gaskets shall be made of plain first grade rubber, free of imperfections and porosity. Hardness shall be 70 to 75 durometer.
- E. Flanged Pipe and Fittings:
1. Ductile iron flanges for pipe and fittings are to have dimensions, facing, and drilling to correspond with ANSI B16.1 125 pound template with pressure rating 250.
  2. Where flanges are pit cast integrally with pipe in vertical position in dry sand molds, flanged pipe shall be latest revision of ANSI Specifications A21.2 for Class 150 or Class 250 pipe. Where flanged pipe is made up by threading plain end, centrifugally cast pipe, screwing on specially designed long hub flanges, and refacing across both face of flange and end of pipe, flange shall be per ANSI Specification B16.1 and pipe shall be ANSI Specification A21.6 Class 125. Either method of manufacture of flanged pipe will be acceptable; except when plain ends fit into mechanical joint bells, then centrifugally cast pipe shall be used.
  3. With prior approval of the Owner or Owner's Representative, the Contractor may use mechanical grooved or shouldered pipe couplings, flanges, and fittings, as manufactured by Victaulic Company of America or approved equal, conforming to ANSI/AWWA C606-97 on ductile iron piping systems in lieu of flanged joints. Grooved product manufacturer is to be certified ISO-9001 single supplier. The Contractor shall install the grooved system by means of reference to the manufacturer's most recent published instruction and ensure that the complete installation is similar in function to a flanged piping system.
  4. With prior approval of the Owner or Owner's Representative, couplings and flanges for use with grooved and shouldered joints shall be ductile iron or malleable iron conforming to ASTM A-536 or A-47. Fittings shall be ductile, ASTM A-536, or cast iron, ASTM A-48. Fittings conforming to center to end dimensions, wall thickness, and rigid grooving dimensions for end pipe preparation as specified in AWWA C-110, AWWA C-153, and AWWA C-606 shall be required. Gaskets shall be the center leg design to conform to ductile pipe surfaces, have properties designated in ASTM A-2000, and shall be suitable for the required service. Bolts shall be heat treated, track head design, plated, and manufactured in accordance with ASTM A-183, minimum tensile 110,000 PSI or Type 304 stainless steel to ASTM A-193, Grade B-8 Class 2.
- F. Restrained Joints, Reaction Anchorage and Blocking:
1. Restrained joint pipe shall be furnished and installed in accordance with these specifications and the manufacturer's recommendations, in the locations shown on the Drawings. Restrained joints shall prevent "pulling apart" of push-on joints due to axial thrust forces. Joints shall restrain against working pressures at least equal to the working pressure rating of the pipe. Restrained joint fittings shall be equal to manufacturer's specifications for "TR FLEX", "Flex-Ring", "Lok-Ring", Megalug, or other approved equal. Restrained joint fittings incorporating set-screws shall not be allowed.

2. Reaction anchorage and blocking (thrust blocks) shall only be allowed where specifically called for on the Drawings, or at the direction of the Owner or Owner's Representative.
  3. Unplugged bell and spigot or bell tees, Y-branches, bends deflecting 11-1/4 degrees or more, and plugs which are installed in buried piping shall be provided with reaction blocking, anchors, joint harness, or other acceptable means for preventing movement of the pipe and joints caused by the internal test pressure.
  4. Concrete blocking shall extend from the fittings to solid undisturbed earth and shall be installed so that all joints are accessible for repair. The bearing area of concrete reaction blocking shall be as shown on the Drawings or as directed by the Owner or Owner's Representative. If adequate support against undisturbed ground cannot be obtained, metal harness anchorages consisting of steel rods across the joint, securely anchored to pipe and fitting or other adequate facilities, shall be installed to provide the necessary support.
  5. Reaction blocking, anchorage, or other supports for fittings installed in fills or other unstable ground or above grade shall be provided as shown on the Drawings or as directed by the Owner or Owner's Representative.
- G. Threaded Joints: Threaded joints shall have red or white lead painting on male threads. Teflon tape may be used on male threads in lieu of paint.
- H. Hot Poured Joints: Compound for cast iron bell and spigot pipe joints shall be caulking lead not less than 99.73% lead meeting AWWA Specifications for jointing water pipes. This method shall be used only when replacing an existing joint.

### PART 3 - EXECUTION

#### 3.1 PIPE LAYING

- A. The pipe shall be protected during handling against impact shocks and free fall. Care shall be taken to avoid dragging the spigot ring on the ground or allowing it to be damaged by contact with gravel, crushed stone, or other hard objects.
- B. After being delivered alongside the trench, the pipe shall be carefully examined for soundness or damage. All pipes shall be new and unused. No piece of pipe or fitting which is known to be defective shall be laid or placed in the lines. If any defective pipe or fitting shall be discovered after the pipe is laid, it shall be removed and replaced with a satisfactory pipe or fitting at no additional cost to the Owner. Before each piece of pipe is lowered into the trench, it shall be thoroughly cleaned out. Each piece of pipe shall be lowered separately unless special permission is given otherwise by the Owner or Owner's Representative. In case a length of pipe is cut to fit in a line, it shall be so cut as to leave a smooth end at right angles to the longitudinal axis of the pipe.
- C. The bell and spigot of the joint shall be cleaned of dirt and foreign matter immediately prior to jointing. The contact surfaces shall be coated with a lubricant, primer or adhesive recommended by the pipe manufacturer, and pushed together until the joint snaps distinctly in place. The pushing together of the pipe may be done by hand or by the use of a bar.
- D. All pipe shall be laid straight between changes in alignment and at uniform grade between changes in grade. When jointed in the trench the pipe shall form a true and smooth line.

- E. Trenches shall be kept dry during pipe laying. Before pipe laying is started, all water that may have collected in the trench shall be removed.
- F. All pipe shall be laid starting at the lowest point and installed so that the spigot ends point in the direction of the flow.
- G. When pipe laying stops for any reason, the exposed end shall be closed with a plywood plug fitted into the bell end, so as to protect it from intrusion of foreign material. The Contractor shall take all precautions to prevent intrusion of any foreign material into the pipe system. Precautions shall also be taken to prevent flotation of pipe caused by flooding of the trench from surface water or ground water.

### 3.2 PIPE INSTALLATION

- A. Excavation and backfilling for pipeline trenches shall be as specified in Section 313000 "Earth Moving", and as shown on the Drawings.
- B. Minimum cover for all pipelines shall be three (3) feet unless otherwise shown on the Drawings.
- C. Jointing: The types of joints described herein before shall be made in accordance with the manufacturer's recommendations.
- D. Bituminous Pavement Replacement: Sections of pavement shall be replaced as required to install the pipelines under the work of this Section. Pavement replacement shall be in accordance with Section 321216, the Standard Details on the Drawings and the Alabama Department of Transportation Standard Specifications.
- E. Before final acceptance, the Contractor will be required to level off all trenches or to bring the trench up to grade. The Contractor shall also remove from roadways, rights-of-way and/or private property all excess earth or other materials resulting from construction in accordance with Section 31 30 00 "Earth Moving."

### 3.3 STREAM CROSSINGS

- A. Ductile Iron Pipe shall be required at all creek and stream crossings. Ductile Iron Pipe shall extend from manhole to manhole. No pipe material changes will be allowed between manholes. Sewer lines shall cross the streams or creeks as near perpendicular to stream flow as possible. Contractor shall be responsible for acquiring all necessary permitting for working in or near a stream. All design specifications shall be approved by the appropriate agencies prior to construction. Standard creek crossing details are included on the Standard Detail Sheets in the Contract Drawings. Contractor shall be responsible for using Best Management Practices (BMP's) for erosion and sediment control as required in all applicable permits required by the regulatory authority having jurisdiction.

### 3.4 CLEAN-UP

- A. Upon completion of the installation of the piping and appurtenances, the Contractor shall remove all debris and surplus construction materials resulting from the work. The Contractor

shall grade the ground along each side of pipe trenches in a uniform and neat manner leaving the construction area in a shape as near as possible to the original ground line or to the grade shown on the Drawings.

#### **PART 4 - TESTING REQUIREMENTS AND INSPECTION**

##### **4.1 GENERAL TESTING REQUIREMENTS**

- A.** During the final inspection, the Owner will inspect each individual line, either by use of lights or other means to determine whether the completed lines are true to line and grade as laid out or as shown on the Drawings.
- B.** Acceptance will be on the basis of tests of materials, adsorption tests, plant load bearing tests, pressure tests, and inspection of the complete product.
- C.** The Owner must be present to witness each test performed before it will be accepted as fulfilling the requirements of these specifications.
- D.** All lines or sections of lines that are found to be laid improperly with respect to line or grade, that are found to contain broken or leaking sections of pipe, or are obstructed in such a manner that they cannot be satisfactorily corrected otherwise, shall be removed and replaced at the Contractor's expense.
- E.** After the piping systems have been brought to completion, and prior to final inspection, the Contractor shall rod out the entire system by pushing through each individual line in the system appropriate tools for the removal from the lines of any and all dirt, debris and trash.
- F.** All apparatus and equipment required for testing shall be furnished by the Contractor at no additional expense to the Owner.

##### **4.2 TESTING OF PIPES AND FITTINGS, GENERAL (GRAVITY SEWER)**

- A.** It is recommended, but not required, that inspection and testing of the sewer lines and manholes be conducted prior to backfilling. Any documentation may be of benefit at the time of the final testing, which is mandatory after all other utilities are installed, roadway sub-grade is laid, and backfill is complete. Final testing requirements for sewer lines and manholes are listed in this Section and Section 331000. The approval and acceptance of the sewer lines and manholes will be based on the final testing. The Contractor must provide a 72-hour notice prior to final testing. A representative from the Owner must be present during final testing procedures before it will be accepted as fulfilling the requirements of these specifications. A copy of all tapes and logs on testing results shall be submitted to the Owner. An independent testing firm as approved by the Owner shall conduct testing. Use of other testing firms shall require prior written approval from the Owner. Approved testing firms are available from the Owner.
- B.** Minimum Testing Requirements:
  - 1.** After the sanitary sewer have been brought to completion, and prior to final inspection, the Contractor shall rod out the entire system by pushing through each individual line in

the system, from manhole to manhole, appropriate tools for the removal from the lines of any and all dirt, debris and trash. If necessary during the process of rodding the system, water shall be turned into the system in such quantities to carry off the dirt, debris and trash. The dirt, debris and trash shall be collected and properly disposed of by the Contractor.

- a. During the final inspection, the Contractor will inspect each individual line, from manhole to manhole, either by use of lights, television or other means at his disposal to determine whether the completed lines are true to line and grade as laid out or as shown on the Drawings.
- b. Deflection Test (Mandrel Test)
  - 1) The Owner or Owner's Representative may require a deflection test to be performed on all flexible pipe. The test shall be conducted after the final backfill has been in place at least 30 days to permit stabilization of the soil-pipe system.
  - 2) No pipe shall exceed a deflection of 5 percent. If deflection exceeds 5 percent, replacement or correction shall be accomplished at the Contractor's expense.
  - 3) The rigid ball or mandrel used for the deflection test shall be a diameter not less than 95 percent of the average inside diameter of the pipe. The pipe shall be measured in compliance with ASTM D 2122 Standard Test Method of Determining Dimensions of Thermoplastic Pipe and Fittings. The test shall be performed without mechanical pulling devices. The Contractor shall thoroughly clean the line prior to the deflection test.
  - 4) The Contractor shall pass through the system, under its own momentum, a rigid ball or mandrel as specified above. All pipes that do not pass ball shall be replaced so that they do pass the ball.
- c. All lines or sections of line that are found to be laid improperly with respect to line or grade, found to contain broken or leaking sections of pipe, or are obstructed in such a manner that they cannot be satisfactorily corrected otherwise, shall be removed and replaced at the Contractor's expense.
- d. The Contractor shall lay sewer mains so that the ground water infiltration shall not average more than 100 gallons per 24 hours per inch of nominal diameter per mile of pipe. The length of the main sewers shall be used in making the foregoing computation.
- e. The Contractor shall provide continuous sanitary sewer service. The Contractor shall be responsible for providing temporary wastewater collection and disposal until a satisfactory leakage test is obtained.
- f. All apparatus and equipment required for testing shall be furnished by the Contractor at no additional expense to the Owner.

#### 4.3 LOW PRESSURE AIR TESTING (GRAVITY SEWER)

- A. The Contractor shall conduct Low Pressure Air Tests of all pipes before putting the new sewers into service. Tests shall be made from manhole to manhole at an average pressure of 3.0 psi greater than the average back pressure of any ground water present and shall be conducted in accordance with the test procedure outlined below. The maximum allowance for air loss during testing shall be determined from tables of minimum holding time for a pressure drop of 1.0 psi

for the particular pipe size and length being tested. These tables are prepared by and may be obtained from the Uni-Bell Plastic Pipe Associated, and at least two copies shall be furnished the Owner or Owner's Representative by the Contractor. A representative from the Owner must be present to witness each satisfactory air test before it will be accepted as fulfilling the requirements of these specifications.

**B. Test Equipment:**

1. The Contractor shall be responsible for acquiring an approved independent testing firm with all necessary equipment and personnel required to conduct the tests. The equipment used shall be identical or equal to the Air-Loc system as manufactured by Cherne Industrial, Inc., Hopkins, Minnesota. Equipment used shall meet the following minimum requirements:
  - a. Pneumatic plugs shall have a sealing length equal to or greater than the diameter of the pipe to be tested.
  - b. Pneumatic plugs shall resist internal test pressures without requiring bracing or blocking.
  - c. All air used shall pass through a single control panel.
  - d. Three individual hoses shall be used for the following connections:
  - e. From control panel to pneumatic plugs for inflation.
  - f. From control panel to sealed line for introducing the low pressure air.
  - g. From sealed line to control panel for continually monitoring the air pressure rise in the sealed line.

**C. Test Procedure:**

1. The sewer line to be tested shall be flushed and cleaned prior to the test (a wetted pipe surface will produce more consistent results).
2. All pneumatic plugs shall be seal-tested before being used in the actual test installation. One length of pipe shall be laid on the ground and sealed at both ends with the pneumatic plugs to be checked. Air shall be introduced into the plugs to 25 psig. The sealed pipe shall be pressured to 5.0 psig. The plugs shall hold against this pressure without movement of the plugs out of the pipe.
3. Plug all pipe outlets with suitable test plugs. It is advisable to restrain gasketed caps, plugs, or short pipe lengths with bracing stakes, clamps and tie-rods, or wire harnesses over the pipe bells.
4. If the sewer line to be tested is submerged in ground water, insert a pipe probe (by boring or jetting) into the backfill material adjacent to the center of the pipe, determine the pressure in the probe when air passes slowly through it. This is the back pressure due to ground water submergence over the end of the probe. All gauge pressures in the test shall be increased by this amount.
5. Add air slowly to the portion of the sewer line installation under test until the internal pressure is raised to 4.0 psig.
6. After an internal pressure of 4.0 psig is obtained, allow at least two (2) minutes for the air temperature to stabilize, adding only the amount of air required to maintain pressure.
7. When the pressure decreases to 3.5 psig, start timing with a stopwatch. Determine the time, in seconds, that is required for the internal air pressure to reach 2.5 psig (a drop of 1.0 psig). Minimum permissible pressure holding times for runs of single pipe diameter and are indicated in the following table in minutes (where L = Pipe length MH to MH).

| Pipe Diameter<br>(inches) | Minutes    |
|---------------------------|------------|
| 8                         | 5.0        |
| 10                        | 6.5        |
| 12                        | 9.5        |
| 16                        | 15.5       |
| 18                        | 25.5       |
| 21                        | 34.5       |
| 24                        | 6.837*L/60 |

8. When the sewer section to be tested contains more than one size of pipe, the minimum allowable time shall be based on the largest diameter pipe in the section, and shall be the time shown in the table reduced by 0.5 minutes.
9. If the pressure drops 1.0 psig before the appropriate time shown on the table has elapsed, the air loss rate shall be considered excessive and the section of pipe has failed the test.
10. If the section fails to meet these requirements, the Contractor shall determine at his own expense, the sources of leakage, and he shall repair or replace all defective materials and/or workmanship to the satisfaction of the Owner or Owner's Representative. The completed pipe installation shall then be re-tested and required to meet the requirements of this test.
11. It is recommended that inspection and testing of the sewer lines and manholes be conducted prior to backfilling. All documentation should be retained and presented to Owner and Owner's Representative at time of the final testing which is required after all other utilities are installed, roadway sub-grade is laid, and backfill is complete.

**D. Safety Precautions:**

1. The air test may be dangerous if because of ignorance or carelessness a line is improperly prepared. It is extremely important that the various plugs be installed and braced in such a way as to prevent blowouts. Since an internal pressure of 5 psi exerts a force of 250 pounds on an 8-inch plug, it should be realized that the sudden expulsion of a poorly installed plug or of a plug that is partially deflated before the pipe pressure is released can be very dangerous.
2. No one shall be allowed in the manholes of the section being tested at the time of the test or until after the lines have been depressurized.
3. Pressurizing equipment shall include a regulator set at 10 psi to avoid over pressurizing and damaging an otherwise acceptable line.

**E. Smoke Testing:**

1. Smoke testing may be required to locate leaks if the low air pressure testing fails. To test for leaks, the Owner or Owner's Representative may also require that all completed sewers be tested by the so-called smoke method in which smoke is blown into closed-off sections of the sewers under pressure and observation made of any smoke appearing on top of the ground indicating the presence of such leaks. All such leaks or breaks discovered by the smoke tests shall be repaired and/or corrected by the Contractor at his own expense. Equipment and supplies required for smoke tests shall be furnished by the Contractor. The Contractor will be required to smoke test the first section (manhole to

manhole) of each size of pipe and type of joint on each construction contract prior to backfilling to establish and check laying and jointing procedures. Other supplementary smoke tests prior to backfilling may be performed by the Contractor at his option; however, any such tests shall not supplant the final tests of the completed work unless such final tests are waived by the Owner or Owner's Representative.

F. Exfiltration Test:

1. In order to test for infiltration sources, the Owner or Owner's Representative may also require exfiltration tests on each section of pipe between manholes after it has been laid but prior to backfilling of joints. Exfiltration testing may also be used if the low air pressure testing fails. Exfiltration tests shall be conducted by plugging the lower end of the section of sewer to be tested and filling the sewer with water to a point approximately five feet above the invert at the lower end and at least one foot above the pipe at the upper end, observing for leakage at all joints and measuring the amount of leakage for a given interval of time. Exfiltration shall not exceed 110 percent times the infiltration limits set out in Paragraph A.2.e. **ALL OBSERVED LEAKS SHALL BE CORRECTED EVEN THOUGH EXFILTRATION IS WITHIN THE ALLOWABLE LIMITS.** Exfiltration tests will normally be required for flat sections of sewer that are expected to be below the wet-season ground water table.
2. The Contractor shall plug the open ends of all lines at the manhole so that measurements may be made at each section of sewer line. This exfiltration test will not be made until the sewer line is completed, and the Contractor will be required to correct all conditions that are conducive to excessive infiltration and may be required to relay such sections of the line that may not be corrected otherwise. **ALL OBSERVED LEAKS SHALL BE CORRECTED EVEN THOUGH INFILTRATION IS WITHIN ALLOWABLE LIMITS.**

4.4 TESTING OF PIPE AND FITTINGS (FORCEMAIN)

- A. The Owner requires testing of all new public and private forcemains. It is recommended, but not required, that inspection and testing of the forcemain be conducted prior to backfilling. Any documentation may be of benefit at time of the final testing, which is mandatory after all other utilities are installed, roadway sub-grade is laid, and backfill is complete. The approval and acceptance of the forcemain will be based on the final testing. The Contractor must provide a 72-hour notice prior to final testing. A representative from the Owner must be present during final testing procedures before it will be accepted as fulfilling the requirements of these specifications. A copy of all tapes and logs on testing results shall be submitted to the Owner. An independent testing firm as approved by the Owner shall conduct testing. Use of other testing firms shall require prior written approval from the Owner. Approved testing firms are available from the Owner.
- B. Minimum Testing Requirements
  1. All lines or sections of lines that are found to be laid improperly with respect to line or grade, that are found to contain broken or leaking sections of pipe, or are obstructed in such a manner that they cannot be satisfactorily corrected otherwise, shall be removed and replaced at the Contractor's expense.
  2. After the piping systems have been brought to completion, and prior to final inspection, the Contractor shall rod out the entire system by pushing through each individual line in

the system appropriate tools for the removal from the lines of any and all dirt, debris and trash.

**C. Hydrostatic Pressure Test**

1. The Contractor shall perform pressure tests on all pipe lines and appurtenances installed under this contract. Prior to the testing, the line shall be filled with clean water and all air shall be completely expelled from the pipe. All pipe lines and appurtenances shall be tested at 100 percent over the normal system operating pressure or to the pipe pressure rating class, whichever pressure is less. The normal system operating pressure shall be determined at the low point of the test pipe section. At no time shall the test pressure exceed the pressure pipe rate class.
2. A pipe section shall be accepted as passing the pressure test if the test pressure does not decrease more than five (5) percent for the two (2) hour test period. For each test pipe section, the Owner or Owner's Representative will waive the requirement of a leakage test (see following section) if there is no drop in pressure during the pressure test. Recording pressure charts shall be turned over to the Owner or Owner's Representative at the conclusion of tests.

**D. Leakage Tests for Pressure Piping**

1. The Contractor shall furnish all necessary equipment for pressure testing. Inspection of pipe laying shall in no way relieve the Contractor of the responsibility for passing tests, stopping leakage, or correcting poor workmanship.
2. The Contractor shall furnish suitable test plugs, water pumps, and appurtenances, and all labor required to properly conduct the tests on pipe sections of approved length.
3. The Contractor shall furnish a recording gage and water meter for measuring water used during leakage tests and recording pressure charts during the duration of the test. Recording pressure charts shall be turned over to the Owner or Owner's Representative at the conclusion of the tests.
4. The Contractor shall test all pipelines and appurtenances at normal operating pressure for at least a 24-hour period.
5. The test pipe section shall be considered acceptable if the amount of liquid added to the system at the end of the test period to restore the test pressure does not exceed that allowed by the following formula:

$$L = \frac{ND(P)^{1/2}}{7400}$$

Where, L = allowable leakage in gallons per hour.  
N = number of joints in length of pipe tested.  
D = nominal diameter of pipe (inches).  
P = test pressure (psig).

6. If loss exceeds L, the Contractor shall locate and repair, to the Owner's or Owner's Representative's satisfaction, all leaks until the pipe section will pass another leakage test.

**E. Acceptance of Pressure Piping**

1. For the pipe line to be accepted, the following will be required:
  - a. Pass the pressure test.

- b. Pass the leakage test, unless waived under the pressure test.
  - c. All evidence of leakage identified and repaired.
- 2. Should the sections under test fail to meet the requirements, the Contractor shall do all work of locating and repairing the leaks and re-testing as the Owner or Owner's Representative may require.
  - 3. If in the judgement of the Owner or Owner's Representative, it is impracticable to follow the foregoing procedures for any reason, modifications in the procedures shall be made as required and as acceptable to the Owner or Owner's Representative, but in any event, the Contractor shall be responsible for the ultimate tightness of the line within the above test requirements.

#### 4.5 INSPECTION

- A. After completion of laying and backfilling of new pipe, after all other utilities have been installed and after roadway sub-grade has been laid, the sewer installation shall be television inspected in accordance with Section 338000. All service entrances shall be accounted for. No infiltration should be apparent. If the pipe is not acceptable to the Owner or Owner's Representative, remedies shall be accomplished at the Contractor's expense and to the Owner's satisfaction.

#### 4.6 CLEAN-UP

- A. Upon completion of the installation of the piping and appurtenances, the Contractor shall remove all debris and surplus construction materials resulting from the work. The Contractor shall grade the ground along each side of pipe trenches in a uniform and neat manner leaving the construction area in a shape as near as possible to the original ground line or to the grade shown on the Drawings.

END OF SECTION 33 00 00

## **SECTION 33 10 00 - MANHOLES AND APPURTENANCES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section**

#### **1.2 SUMMARY**

- A. Section Includes:**

- 1. Manholes
- 2. All Related Manhole Appurtenances
- 3. Testing Requirements.

- B. Related Sections:**

- 1. Division 03 "Concrete."
- 2. Division 31 "Earth Work."
- 3. Division 33 "Utilities."

- C. Description of Work**

- 1. This Section shall cover the construction of manholes for sanitary sewers complete with the necessary cast iron frames, covers and steps in accordance with the Drawings and specifications at the locations and to the grades shown. All manholes shall be precast concrete units unless otherwise approved in writing by the Owner.
- 2. All work included in this section shall follow the standards of the Federal Occupational Safety and Health Act and the Alabama Department of Labor.

#### **1.3 SUBMITTALS**

- A. Shop Drawings: For manholes and all required appurtenances including:**

- 1. Precast manholes: Include Drawings, elevations, sections, details, frames and covers.
- 2. Manhole Appurtenances.
- 3. Outside Drop Connection manhole channel system and all required appurtenances.

## **PART 2 - MATERIALS**

### **2.1 PIPE**

- A. All pipe and fittings used on this project shall conform to the requirements of Section 33 00 00 "Pipe and Fittings."**

### **2.2 MANHOLES**

#### **A. General:**

- 1. The Contractor shall construct all manholes as indicated on the Drawings and as specified herein.**

#### **B. Description:**

- 1. Manholes shall conform in shape, size, dimensions, materials, and other respects to the details indicated on the Drawings or bound in the Specifications or as ordered by the Owner or Owner's Representative.**
- 2. All manholes shall have precast reinforced concrete developed bases. No other type of base will be allowed. Sloping invert channels shall be constructed whenever the difference between the inlet and outlet elevation is two (2) feet or less.**
- 3. Manhole walls (barrels and cones) shall be precast concrete sections. The top of the eccentric cone shall be built of reinforced concrete adjustment rings to permit adjustment of the frame to meet the finished surface. No more than three adjustment rings (maximum of 12 inches) will be allowed.**
- 4. The inverts of the developed bases shall conform accurately to the size of the adjoining pipes. Side inverts shall be curved and main inverts (where direction changes) shall be laid out in smooth curves of the longest possible radius, which is tangent, within the manhole, to the centerlines of adjoining pipelines. Precast inverts meeting the above requirements will be allowed.**

#### **C. Technical Requirements:**

- 1. The cast-iron frames and covers shall be the standard frame and cover as indicated on the Standard Details and as specified hereinafter in this Section.**
- 2. All cast-in-place concrete shall be Class A and shall conform to the requirements specified in the Alabama Department of Transportation, Standard Specifications.**
- 3. All holes for pipe connections in barrels and bases shall have a flexible pipe-to-manhole connector to prevent infiltration. The connector shall be A-LOK, or approved equivalent. The connectors shall be installed in the manhole wall in strict accordance with the recommendations of the connector manufacturer. All connectors shall comply with the requirements of ASTM C-923. The connectors shall be as shown on the Standard Details contained in the Drawings.**
- 4. Contractor shall provide precast manholes, which have been approved by the Owner.**
- 5. All precast manholes shall be new, unused manholes delivered directly from the manufacturer to the job site. Manholes, which have been stored by the Contractor for a long period of time, are not acceptable.**
- 6. The following definitions cover the types of manholes used:**

- a. **Standard Manhole:** A standard manhole is defined as any manhole that is greater than 5 feet in depth, as measured from the invert of the manhole base at its center to the finished ground.
- b. **Shallow Manhole:** A shallow manhole is defined as any manhole that is 5 feet or less in depth, as measured in the preceding sentence.
- c. **Drop Manhole:** A drop manhole is defined as any manhole having a difference in elevation greater than 2 feet between inverts.

**D. Precast Concrete Sections:**

1. Precast concrete sections and appurtenances shall conform to the ASTM Standard Specifications for Precast Reinforced Concrete Manhole Sections, Designation C-478, latest revision, with the following exceptions and additional requirements:
2. The wall sections shall not be less than 5 inches thick for a 48 inch diameter manhole, 6 inches thick for a 60 inch diameter manhole and 7 inches thick for a 72 inch diameter manhole.
3. Type II or III cement shall be used except as otherwise permitted and as required in Division 03 shall be met.
4. Sections shall be cured by subjecting them to thoroughly saturated steam as a temperature between 100 degrees and 130 degrees F for a period of not less than 12 hours or, when necessary, for such additional time as may be needed to enable the sections to meet the strength requirements.
5. No more than two lift holes may be cast or drilled in each section. Lift hole inserts shall be required. Lift eyes as provided by the manufacturer shall be inserted and used to move manhole sections. The lift systems shall be as manufactured by M.A. Industries or approved equivalent. Holes shall not penetrate the wall of the manhole. All lift holes, except those in the cone section, shall be plugged with non-shrink grout as specified in this Section.
6. Flat slab tops shall not be used unless otherwise directed by the Owner.
7. The date of manufacture and the name or trademark of the manufacturer shall be clearly marked on the outside of the barrel.
8. Acceptance of the sections will be on the basis of material tests and inspection of the completed product.
9. Eccentric cones shall be precast sections of similar construction.
10. The tops of the bases shall be suitably shaped by means of accurate bell-ring forms to receive the barrel sections.

**2.3 MANHOLE FRAMES AND COVERS**

**A. General:**

1. The Contractor shall furnish all cast-iron manhole frames and covers conforming to the Standard Details and as specified herein.
2. The castings shall be of good quality, strong, tough, even-grained cast-iron, smooth, free from scale, lumps, blisters, sandholes, and defects of every nature which would render them unfit for the service for which they are intended. Contact surfaces of covers and frame seats shall be machined to prevent rocking of covers.
3. All castings shall be thoroughly cleaned and subject to a careful hammer inspection.

4. Castings shall be at least Class 30 conforming to the ASTM Standard Specifications for Gray Iron Castings, Designation A-48, latest revision. Covers and frames shall be made in the United States, and shall be made of materials from the United States.
5. All castings shall be provided unpainted.
6. Unless otherwise specified, manhole frames and covers shall be self-sealing, and shall be Vulcan Foundry Inc., V-1355, with two (2) non-penetrating pick holes, or equivalent.
7. Where indicated on the Drawings, or where the top of manhole elevations are below the 100-year flood elevation, manhole covers shall be of the watertight type. The frames and covers shall be self-sealing, and shall be Vulcan Foundry, Inc., V-2355 as shown on the Drawings, or equal. A watertight gasket seal shall be installed under the cover that prevents entry of water into the manhole. Watertight frame and covers shall be bolted to the manhole as shown on the Standard Details.
8. All covers shall be marked as shown on the Standard Details. Castings shall also be clearly marked with the manufacturers name, company logo, and "Made in USA" in cast letters.
9. Contractor shall provide manhole frame and covers, which have been approved by the Owner.

#### 2.4 STUBS IN MANHOLES

- A. Stubs shall be installed at all dead end manholes.
- B. Stubs shall be set accurately to the required line and elevation and shall be installed in the manhole masonry as indicated on the Drawings.
- C. Polyvinyl chloride (PVC) stubs shall be short pieces of PVC pipe with bell ends and plugs.

#### 2.5 MANHOLE STEPS

- A. Manhole steps shall be of polypropylene plastic type reinforced with ½ inch grade 60 steel reinforcement rods. The steps shall be of the size and configuration as shown in the Standard Details. The steps shall be MA Industries PS1-PF on 16 inch centers in vertical alignment per ASTM C 478 or approved equal. The steps shall be embedded into the manhole wall a minimum of 3 inches and be centered under the manhole cover opening. The bottom step shall be a maximum of two (2) feet above the fillet. The steps shall be capable of withstanding a force of 350 pounds, applied at any place on the step and in any direction which projects from the point of application through a diameter of the step cross-section at that point, with no permanent deformation resulting.

#### 2.6 NON-SHRINK GROUTS

- A. All surfaces shall be cleaned and shall be free of debris, grease, oil, etc. All loose concrete shall be removed prior to patching. All water used in mixing processes shall be clean and potable. All grouts shall be mixed and applied in strict accordance with manufacturer's recommendations.
- B. Manhole to Pipe Connection, Bench, and Invert: Grout shall be a non-shrink type, rapid setting, corrosion resistant, cement based material. All grouting in these areas shall be preformed with

Conspec All-Patch as manufactured by Conspec Marketing and Manufacturing Co., Inc., Kansas City, Kansas or with Strong Seal QSR as manufactured by The Strong Company, Pine Bluff, Arkansas or approved equivalent. Non-shrink grouts shall be mixed and applied in strict accordance with manufacturer's recommendations.

- C. Interior Joints, Lift Holes, and Connections: Grout shall be a non-shrink type, rapid setting, corrosion resistant cement repair material. All grouting in these areas shall be performed with Waterplug as manufactured by ChemRex, Inc., Shakopee, Minnesota or with BONSAL Instant Hydraulic Cement as manufactured by W.R. Bonsal Company, Charlotte, North Carolina or approved equivalent. Non-shrink grouts shall be mixed and applied in strict accordance with manufacturer's recommendations.
- D. Manhole Interior: Grout shall be a hydraulic cement coating that produces a waterproof surface after application. Grout for manhole interior repairs shall be ThoRoc Brushbond as manufactured by Harris Specialty Chemicals, Inc., Jacksonville, Florida or approved equivalent. Non-shrink grouts shall be mixed and applied in strict accordance with manufacturer's recommendations.

## 2.7 INSIDE DROP CONNECTION

- A. Installation shall comply with manufacturer's written instructions.
- B. Inside Drop Connection shall meet the requirements shown on the Standard Details.
  - 1. Furnish Inside Drop Connection by Duran, Inc. "Reliner" Fiberglass Drop Bowl, or approved equal.
  - 2. Drop pipe shall be of the material as shown on the Drawings.
  - 3. Brackets and Fasteners shall be stainless steel 304 installed at no more than 4 feet apart (2 minimum per drop).

## PART 3 - EXECUTION

### 3.1 MANHOLE INSTALLATION

- A. Precast reinforced concrete manhole sections shall be set so as to be vertical and with sections in true alignment complete with appurtenances and accessories indicated.
- B. Joints between sections on manholes shall be made watertight through the use of a one (1) inch diameter butyl sealant, CS-231, as manufactured by Conseal or approved equal, and a Hamilton Kent rubber gasket (pre-lubricated manhole rubber gasket) as supplied by Sherman Industries, or approved equal. This same method as described above shall be used for larger sized manholes. The manhole manufacturer shall provide appropriate sized sealants and gaskets for the larger diameter manholes. A detail of the method described above is shown on the Drawings. Gaskets shall conform to the ASTM Standard C 443, latest revision. A rubber gasket (ASTM C-443) and CS-231 shall be required at each joint.

- C. Form continuous concrete channels and benches between inlets and outlets.
- D. Set tops of frame and covers flush with finished surface of manholes that occur in pavements. Set tops above finished surface elsewhere as indicated.
- E. Install manhole cover inserts in frame and immediately below cover.
- F. Vent pipes shall be installed at all locations shown on the Drawings. Vent pipes shall be constructed of four (4) inch diameter galvanized steel and be turned down at top end of pipe at least one foot above 100 year flood elevation. Holes in manholes to be core drilled ¼ inch in diameter larger than vent pipe and grouted with expansion grouting. Vent pipe to be flanged and supplied with a ¼ inch thick rubberized gasket and a minimum of four ½ inch bolts securely fastened to manhole. Vent pipe assembly so as to not interfere with structural integrity steps, rings and cover of manhole.

### 3.2 SETTING MANHOLE FRAMES AND COVERS

#### A. General:

1. Manhole frames shall be set with the tops conforming to the required elevations set forth in Part 2 of this Section. A controlled expansion waterstop or butyl sealant of Conseal CS-231 or approved equal shall be placed beneath the frame and between each concrete adjusting ring. A maximum of three concrete adjustment rings (maximum of 12 inches) shall be used. Frame shall be set concentric with the top of the precast concrete masonry and in a full bed of non-shrink grout so that the space between the top of the manhole masonry and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of non-shrink grout extending to the outer edge of the masonry shall be placed all around and on the top of the bottom flange. The non-shrink grout shall be smoothly finished and have a slight slope to shed water away from the frame.
2. Manhole covers shall be left in place in the frames on completion of the work at each manhole.

#### B. Adjusting Manhole Frames and Covers to Grade

1. The top of the precast concrete eccentric cone of a standard manhole shall terminate 4 inches below existing grade in an unpaved non-traffic area other than in a residential yard and 13 inches below existing grade in a paved or unpaved traffic area and in a residential yard. The remainder of the manhole shall be adjusted to the required grade as described hereinafter.
2. When a manhole is located in an unpaved non-traffic area other than a residential yard, the frame and cover shall be adjusted to an elevation 3 inches to 5 inches above the existing grade at the center of the cover. If field changes have resulted in the installed manhole invert elevation to be lower than the invert elevation shown on the Drawings, the adjustment to an elevation of 3 inches to 5 inches above existing grade shall be accomplished by the use of precast concrete adjustment rings. A maximum of three adjustment rings (maximum of 12 inches) shall be used. If field changes have resulted in the complete manhole invert to be greater than the invert shown on the Drawings and the cover higher than 5 inches above existing grade, then the top of the barrel section, when used, shall be trimmed down so that the manhole cover, after installation, is no greater than 5 inches above existing grade at the center of the cover. The area around the

adjusted frame and cover shall be filled with the required material sloping it away from the cover at a grade of one (1) inch per foot. After installation, the inside and outside surfaces of the concrete rings shall receive a waterproofing bitumastic coating.

3. When a manhole is located in a bituminous, concrete, or crushed stone traffic area, or in a residential yard, the frame and cover shall be adjusted to the grade of the surrounding area by the use of precast concrete rings. A maximum of three adjustment rings (maximum of 12 inches) shall be used. The adjusted cover shall conform to the elevation and slope of the surrounding area. If field changes have resulted in the installed manhole invert elevation to be so much higher than the invert elevation shown on the Drawings that the top of the eccentric cone, when used, is less than the thickness of the frame and cover (7 inches) from the grade of the surrounding area, then the top of the cone or barrel section shall be trimmed down enough to permit the cover, after installation, to conform to the elevation and slope of the surrounding area. After installation the inside and outside surfaces of the concrete rings shall receive a waterproofing bitumastic coating.

**C. Precast Concrete Adjustment Rings**

1. A maximum of three adjustment rings (maximum of 12 inches) shall be used per manhole as shown on the Standard Details. Butyl sealant of Con Seal CS-231 or approved equal shall be placed beneath the frame and between each concrete adjusting ring as shown on the Standard Details.

**3.3 CONNECTION TO EXISTING MANHOLES**

- A. When connecting sewers to existing manholes, the Contractor shall provide all diversion equipment and perform all work necessary to maintain sewage flow in existing sewers during connection to manholes. Refer to Section "Maintaining Wastewater Flow" for requirements to maintain sewage flow in existing sewers during connection to existing manholes.
- B. Where an existing manhole does not have existing stubs, it will be necessary for the Contractor to construct a new invert for the existing manhole. When connecting a new sewer line to an existing manhole, the existing manhole shall be core drilled and flexible boots shall be installed using stainless steel bands to connect the pipe.
- C. The new forcemain shall be connected to the existing sewer line as shown in the Standard Details and as specified in this Section.

**3.4 TESTING OF MANHOLES**

- A. The Owner requires testing of all new public and private sanitary sewer lines and manholes. The Contractor must provide a 72-hour notice prior to final testing. A representative from the Owner must be present during final testing procedures before it will be accepted as fulfilling the requirements of these Specifications. A copy of all tapes and logs on testing results shall be submitted to the Owner. An independent testing firm as approved by the Owner shall conduct testing. Use of other testing firms shall require prior written approval from the Owner. A list of approved testing firms is available from the Owner. On all projects involving installation of sanitary sewer manholes, the finished work shall comply with the provisions set below and per ASTM C 1244.

**B.** It is recommended that each manhole be vacuum tested immediately after assembly and prior to backfilling. The Contractor may at his own risk backfill around the manhole, as soon as practicable after the joints have acquired a suitable degree of hardness. He shall, however, be responsible for removing and later replacing such backfill, at his own expense, should he be ordered to do so in order to locate and repair or replace leaking or defective joints in the manhole. Any documentation might be of benefit at time of the final testing, which is mandatory after all other utilities are installed, roadway sub-grade is laid, and backfill is complete. The approval and acceptance of the sewer lines and manholes will be based on the final testing. All manholes shall be vacuum tested during the final testing procedures.

1. All lift holes, except those in the cone section, shall be plugged with an approved non-shrinking grout as specified in this Section.
2. All pipes entering the manhole shall be plugged, taking care to securely brace the plug and to prevent the flexible connector from being drawn into the manhole.
3. The test head shall be placed at the top of the frame and the seal inflated in accordance with the manufacturer's recommendations.
4. A vacuum of ten (10) inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to nine (9) inches. The manhole shall pass if the time is greater than 60 seconds for 48 inch diameter, 75 seconds for 60 inch diameter, and 90 seconds for 72 inch diameter manholes.
5. If the manhole fails the initial test, necessary repairs shall be made with a non-shrinking grout as specified in this Section. The Contractor will be allowed to re-test the manhole one additional time. If the manhole fails the test a second time, the Contractor will be responsible for supplying and installing a brand new manhole. In addition, the Contractor will retest the new manhole as well as all pipe segments connected to the new manhole.

### **3.5 CLEAN-UP**

- A.** Upon completion of the installation of the manholes and appurtenances, the Contractor shall remove all debris and surplus construction materials resulting from the work. The Contractor shall grade the ground around each manhole in a uniform and neat manner leaving the construction area in a shape as near as possible to the original grade or as shown on the Drawings.

### **3.6 RECORD DRAWINGS**

- A.** Record Drawings are required and shall comply with the requirements of Division 01 and any additional requirements set forth by the Owner.

**END OF SECTION 33 10 00**

## SECTION 33 40 00 - VALVES AND APPURTENANCES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

##### A. Related Sections:

1. Division 01 Section 01 33 00 "Submittal Procedures" for shop drawing and other submittal requirements.
2. Division 33 "Pipe and Fittings" for pipe and fitting requirements.

- B. The Contractor shall furnish and install valves and miscellaneous piping appurtenances, as indicated on the Drawings and as herein specified.

- C. The Drawings and Specifications direct attention to certain features of the equipment, but do not purport to cover all the details of their design. The equipment furnished shall be designed and constructed equal to the high quality equipment manufactured by such firms as are mentioned hereinafter, or as permitted by the Owner or Owner's Representative. The Contractor shall furnish and install the equipment complete in all details and ready for operation.

- D. Enclosures shall be of a suitable type for the atmospheres in which they are installed.

- E. Sizes and capacities not specified herein are indicated on the Drawings.

- F. All work included in this section shall follow the standards of the Federal Occupational Safety and Health Act and the Alabama Department of Labor.

#### 1.3 SUBMITTALS

- A. Shop Drawings: Include shop drawing submittals for all valves, gates, hydrants and other miscellaneous piping appurtenances as required to complete the work and as listed Products of this Specification Section.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer that has specialized in valves and appurtenances required for this Section and all related Sections.

- B. Regulatory Requirements: Comply with all regulatory requirements with authorities having jurisdiction in this project.

## **PART 2 - PRODUCTS**

### **2.1 GATE VALVES**

- A. Valves shall be of the non-lubricated, eccentric type with resilient faced plugs, with flanged ends as shown on the Drawings. Port areas of 4 to 20 inch valves shall be at least 80% of full pipe area. Port areas of 24 inch and larger valves shall be at least 70% of full pipe area. Bodies shall be semi-steel with raised seats. Seats in 3 inch and larger valves shall have a welded-in overlay of not less than 90% pure nickel on all surfaces contacting the plug face. Screwed in seats will not be accepted. Valves shall have stainless steel permanently lubricated upper and lower plug stem bushings. Stem bushings with "O" rings are not acceptable. Valves shall be filled with alemite grease fittings installed at the top and bottom journals to allow bearing lubrication. All valves 4 inch and larger shall be of the bolted bonnet design. Valves shall be designed so that they can be repacked without removing the actuator or the bonnet from the valve. Packing on all valves shall be adjustable.**
- B. All exposed nuts, bolts, springs, and washers shall be zinc plated. Means of actuation shall be lever, gear actuator, tee-wrench, extension stem, floor stand, etc., indicated on the Drawings. Flanged valves through 12 inch shall have face-to-face dimensions of standard gate valves. Valves shall be designed for 150 pounds working pressure.**
- C. Valve bodies shall be of ASTM A126 Class B cast iron in compliance with AWWA Standard C-504-70 Section 6.4. All exposed nuts, bolts, springs, washers, etc. shall be zinc plated. Resilient plugs facing shall be of neoprene, suitable for use with sewage.**
- D. Valve shall be furnished with replaceable, sleeve type bearings in the upper and lower journals. These bearings shall comply with AWWA Standard C507-73, Section 8 paragraphs 8.1, 8.3, and 8.4.**
- E. Valve shaft seals shall comply with AWWA Standard C507-73 Section 10 and with AWWA C504-70.**
- F. Valve and actuators for submerged or buried service shall have seals on all shafts, and gaskets on valve and actuator mounting brackets for submerged service shall be totally enclosed and shall have gasket seals. All exposed nuts, bolts, springs and washers for submerged valves shall be stainless steel.**
- G. Valves up to 12 inches shall have 175 psi working pressure, valves larger than 12 inches shall have 150 psi working pressure.**
- H. Valves shall be metal-to-metal seated or hard rubber lined. For manual valves, levers shall be of the lift, turn and reseal type to provide single lever valve operation and shall have a locking device to hold the plug in the desired position. Handwheel actuators for metal-to-metal seated or hard rubber lined valves for flow diversion shall be totally enclosed and shall be of the worm and gear type.**
- I. Actuators shall be sealed to prevent entry of dirt, water and corrosive atmospheres, and shall have corrosion resistant bearings on the gear sector. Actuators for metal-to-metal seated or hard rubber lined valves shall have a single or double handwheel to rotate the plug and shall provide plug rotation up to 360°.**

- J. Gate Valves shall be manufactured by Dezurik or approved equal.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Valves shall be installed as nearly as possible in the positions indicated on the Drawings consistent with convenience of operating the handwheel or wrench. All valves shall be carefully erected and supported in their respective positions free from all distortion and strain on appurtenances during handling and installation.
- B. All material shall be carefully inspected for defects in workmanship and material, all debris and foreign material cleaned out of valve openings and seats, all operating mechanisms operated to check their proper functioning, and all nuts and bolts checked for tightness.
- C. Valves and other equipment that do not operate easily or are otherwise defective shall be repaired or replaced at no additional expense to the Owner.
- D. Valves shall not be installed with stems below the horizontal.
- E. Valves shall be set plumb and supported adequately in conformance with the instructions of the manufacturer. Valves mounted on the face of concrete shall be shimmed vertically and grouted in place. Valves in the control piping shall be installed so as to be easily accessible.
- F. Where chain wheels are provided for remote operation of valves, two S-shaped hooks shall be provided for each valve to enable the chains to be hooked so as not to interfere with personnel traffic.
- G. Valves shall be provided with extension stems where required for convenience of operation. Extension stems shall be provided for valves installed underground and elsewhere so that the operating wrench does not exceed 4 ft. in length.
- H. A permanent type gasket of uniform thickness shall be provided between flanges of valves and sluice gates and their wall thimble.
- I. Wall thimbles shall be accurately set in the concrete walls so that the gates can be mounted in their respective positions without distortion or strain.
- J. Gate valves in horizontal sewage and sludge piping, which are not buried, shall be installed such that when in the open position, the plug is located in the upper part of the valve body. Valves shall be oriented so that in the closed position, the plug is at the upstream end of the valve.
- K. Floor stand operators and stem guides shall be set so that the stems shall run smoothly in true alignment. Guides shall be anchored firmly to the walls. Distances from the centerlines of gates to the operating level or base of floor stand shall be checked by the Contractor and adjusted if necessary to suit the actual conditions of installation.

**3.2 FINISHES**

- A. Interior surfaces of all hydrants, iron body gate valves, the exterior surfaces of buried or submerged valves and miscellaneous piping appurtenances shall be given a shop finish of an asphalt varnish.**

**END OF SECTION 33 40 00**

## SECTION 33 70 00 - MAINTAINING WASTEWATER FLOW

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:

- 1. This Section shall include all pumps, hoses, tank trucks, traffic control, clean up, and any other materials required to effectively by-pass pump and maintain continuous wastewater flow in the existing sewer system.
- 2. The Contractor shall furnish all labor, materials, tools and equipment necessary to maintain wastewater flows in the sewer by means of by-pass pumping around the sewer segment or manhole to maintain flow continuously until rehabilitation work is completed.

#### 1.3 SUBMITTALS

- A. Shop Drawings: For bypass pumping. Include plans, elevations, sections, details, and attachments to other work.
  - 1. Detail equipment assemblies and indicate capacity, dimensions, method of field assembly, components, and location and size of all equipment installed.

### PART 2 - PRODUCTS (NOT USED)

### PART 3 - EXECUTION

#### 3.1 CONSTRUCTION REQUIREMENTS

- A. The Contractor shall contact the Owner 48 hours in advance of any work related to wastewater flow control in existing systems. Procedures and equipment planned by the Contractor for maintaining wastewater flow during rehabilitation work shall be coordinated with the Owner.

#### 3.2 DEPTH OF FLOW

- A. If the depth of flow in the existing sewer segment at a point upstream of the rehabilitation work is above the maximum allowable depth for television inspection, joint testing and/or sealing, flow shall be reduced to an acceptable level for lining or other rehabilitation by operation of

pump station, plugging or blocking of the sewer, or by pumping and bypassing of flow as specified.

- B. In performing television inspection, joint testing and/or sealing and other sewer rehabilitation work, the Contractor shall control the depth of flow in the sewer within the following guideline:

| <b>MAXIMUM PIPE FLOW DEPTH</b> |                              |                                  |                              |                      |                              |
|--------------------------------|------------------------------|----------------------------------|------------------------------|----------------------|------------------------------|
| <b>TELEVISION INSPECTION</b>   |                              | <b>JOINT TESTING AND SEALING</b> |                              | <b>PIPE LINING</b>   |                              |
| <b>PIPE DIAMETER</b>           | <b>FLOW DEPTH, % OF DIA.</b> | <b>PIPE DIAMETER</b>             | <b>FLOW DEPTH, % OF DIA.</b> | <b>PIPE DIAMETER</b> | <b>FLOW DEPTH, % OF DIA.</b> |
| 6 - 10 in.                     | 20%                          | 6 - 12 in.                       | 25%                          | 6 - 10 in.           | 20%                          |
| 12 - 24 in.                    | 25%                          | 15 - 24 in.                      | 30%                          | 12 - 24 in.          | 25%                          |
| 27 in. or more                 | 30%                          | 27 in. or more                   | 35%                          | 27 in. or more       | 30%                          |

- C. When sewer line flows, as measured in the first manhole upstream of the sewer segment being rehabilitated, exceed the maximum depths listed above or inspection of the complete pipe periphery is necessary for effective testing, sealing or line work, the Contractor shall implement wastewater flow control methods at no additional cost to the Owner

### 3.3 SEWER PLUGGING OR BLOCKING

- A. During any type of sewer rehabilitation work, if necessary to temporarily control wastewater flow, after proper notice is given to the Owner, the Contractor may plug or block the sewer pipe.
- B. A sewer line plug shall be inserted into the pipe at a manhole upstream from the section being inspected, lined, replaced, tested and/or sealed. The plug shall be so designed that during all or any portion of the operation, wastewater flows shall be shut off or substantially reduced in order to properly inspect the pipe at the invert. After rehabilitation work is complete, flows shall be restored to normal.

### 3.4 BYPASS PUMPING

- A. Where pumping is required, for wastewater flow control, in the opinion of the Owner, to assure completion of the inspection, replacement, lining or testing and sealing work, the Contractor shall furnish pumping equipment, traffic control, conduits, fittings, barricades, safety equipment, power and other necessary equipment. No pumping operations shall be performed from manhole to manhole in which wastewater is allowed to enter surface drainage facilities, ditches, or natural water courses.
- B. Sanitary sewage shall be pumped directly into the nearest downstream available manhole, providing that the existing sewer has capacity to transport the flow, or, if no manhole is available, into tank trucks for hauling sewage. The Contractor shall be responsible for keeping pumps running continuously, 24 hours a day if required, until the by-pass operation is no longer required.

- C. The by-pass system shall have adequate capacity to handle existing wastewater flow plus any additional peak flows which may occur during the rehabilitation work process.

### 3.5 PRECAUTIONS AND LIABILITY

- A. During wastewater flow control operations, the Contractor shall take proper precautions to prevent flooding and/or damage to existing sanitary sewer facilities, or to public or private property.
- B. The Contractor shall make repairs or replacements or rebuild any damaged section or sections of existing sewers, as directed by the Owner. All such repairs, replacements, and rebuilding shall be paid for by the Contractor.
- C. The Contractor shall make provisions as necessary for handling all flows in existing sewers, connections, and manholes by pipes, flumes, or by other approved methods at all times in which operations would interfere with normal functioning of those facilities.
- D. The Contractor shall be responsible for the removal of any debris and sedimentation in the existing sewers, laterals and manholes, etc. which is attributable to work under this Contract.
- E. All operations shall be performed by the Contractor in strict accordance with OSHA and any applicable local safety requirements. Particular attention of the Contractor is directed to safety regulations for excavations and entering confined spaces.
- F. It is the Contractor's responsibility to notify any property owner having a sewer service connection on the sewer being rehabilitated that such work is being performed. The Contractor shall be solely responsible for any damage caused by property service connection backups caused by the Contractor's sewer rehabilitation operations.
- G. If sewage should leak or spill during any of the Contractor's operations under this Contract, the Contractor shall immediately contact the Owner and implement emergency containment actions.

END OF SECTION 33 70 00

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## SECTION 33 80 00 - TELEVISION INSPECTION OF SEWERS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

##### A. Section Includes:

1. Television Inspection of Sewers
2. Maintaining Wastewater Flow
3. Digital Video Disc Recorder requirements.
4. Digital Camera requirements.

##### B. Related Sections:

1. Division 01 "Project Management and Coordination" for recording Television Inspection of Sewers.
2. Division 31 "Earth Moving."
3. Division 33 "Utilities."

- C. This Section provides for the operations necessary to complete internal inspections of sewers to verify work completed. All line segments installed shall be inspected after completion of the project.

- D. The Contractor shall furnish all labor, materials, equipment, tools and other incidental services required for closed circuit television inspection work.

### PART 2 - PRODUCTS

#### 2.1 TELEVISION EQUIPMENT

- A. The television camera shall be specifically designed and constructed for internal sewer inspections and operate in a 100% humid condition. Inspection cameras shall be a pan and tilt type camera and mounted on crawlers. Conventional camera skids, floating skids or rafts may be used with the approval of the Owner. Quality of camera equipment and accessories shall be such that a clear, in-focus, non-distorted, color picture is produced for the entire inside pipe periphery for a distance of least six (6) feet. The camera monitor shall be located within a temperature controlled mobile inspection unit that will comfortably accommodate three people observing sewer line inspections by television.

## **2.2 DIGITAL VIDEO DISC (DVD) RECORDER**

- A. A standard digital video disc (DVD) recorder shall be provided by the Contractor in order to make video and audio recordings of the sewer inspection work. The DVD shall be a standard disk capable of recording no less than 120 minutes of video and shall be suitable for recording directly from the television inspection camera.**

## **2.3 DIGITAL CAMERA**

- A. A digital camera for making still photographs shall be furnished with appropriate lens and mounting accessories to "frame" the television monitor exactly. Still photographs which have less than total screen or extend beyond screen area will not be accepted.**

## **PART 3 - EXECUTION**

### **3.1 EXISTING SEWER CONDITIONS**

- A. Information and data concerning depth of flow in sewers, accessibility of manholes, traffic conditions or other considerations relative to performance of the inspection work shall be the responsibility of the Contractor.**

### **3.2 TELEVISION INSPECTION**

- A. A closed-circuit television camera shall be moved slowly through the sewer stopping as necessary to verify or record internal defects. Defects and pipe conditions shall be coded using the most current Pipeline Assessment and Certification Program (PACP) format and must be compatible with the Owner's software. When conditions permit, the inspection shall start at the upstream manhole and proceed to the downstream manhole. If a blockage impedes the progress of the camera, then the remaining portion of the sewer shall be inspected by progressing the camera upstream from the downstream manhole. Electric winches, television cable, camera skids and other equipment used to transport the camera shall not obstruct the picture or interfere with proper documentation of sewer conditions.**
- B. The camera shall be used to inspect all lateral connections in the sewer line. The Contractor shall be responsible for determining which laterals are active or inactive.**
- C. A skilled technician shall control operation of equipment from a control panel located in the television unit. This technician shall control television camera movement at all times. Camera operation may be accomplished by remote control winches, by telephone or other suitable means of communication between the winches at either end of the sewer line segment being inspected.**

### **3.3 DOCUMENTATION**

- A. An electronic log of the television inspection shall be kept on a form acceptable to the Owner, and note identification of sewer size, line segment, manhole-to-manhole direction of travel, pipe construction material, point of entry of service connections (using a clock system), root conditions, bad joints, dips in the pipe, and any other structural defects. Each of the above items shall be recorded on the inspection log, along with the distance from the reference manhole. Digital and/or color copies of any photographs or video recordings taken during the inspection shall be submitted to the Owner along with one computer generated copy of the television inspection log. The television inspection logs shall be submitted weekly within five (5) working days after completion. The electronic log shall be coded using the most current PACP format. Data that is not compatible with the Owner's software will not be accepted.**
- B. Television inspection documenting the pre-construction pipe conditions shall not be required to be coded using the most current PACP format nor shall it be required to be compatible with the Owner's software.**

### **3.4 PRECAUTIONS AND LIABILITY**

- A. The Contractor shall take necessary precautions to ensure safety during inspection setup, operation, and breakdown. Requirements of OSHA with respect to confined space entry shall be met by the Contractor at all times. If a television inspection unit becomes lodged in the sewer line, if possible remove the unit from the line at the nearest manhole. If excavation is required to remove the television unit, the Contractor shall replace or repair any damage to the sewer pipe that occurs as a result in accordance with appropriate sections of this Specification at no extra cost to the Owner.**
- B. The Contractor shall take all precautions to avoid damage to existing pipes, service connections, service laterals, and private residences during television inspection activities. The Contractor shall assume all liability for any such damages and shall make any repairs to the satisfaction of the Owner at the Contractor's expense.**

**END OF SECTION 33 80 00**



# HUNTSVILLE

Kathy Martin, P.E.  
Director  
City Engineer

Urban Development Department  
Engineering Division

**WPC SANITARY SEWER RELOCATION-COUNTY LINE ROAD & I565**  
**Project No. 65-12-SM01 & ALDOT Project No. IM-I565(307)**  
**January 21, 2014**

**Addendum #1**

The attached pre-bid meeting minutes, all addenda, and attachments for the above- referenced project will become part of the contract documents.

Contractors are authorized to download quantities from website and paste to floppy disk or CD-RW (preferably in a live/flash drive format) of their choice; one or the other must be submitted with the original bid packet. In addition, two hard copies must be signed and submitted with original bid packet. If a price discrepancy is found on bid disk or CD-RW, or the correct version of bid quantities is not submitted on the disk or CD-RW which corresponds to the printed hard copy, then printed hard copy prices submitted with original bid documents, with Contractor signature, will prevail. However, calculations must be accurate and will be verified manually.

- Any bidder who designates a change on the outside of the envelope understands that any deletions or additions designated, bidder must further indicate the particular bid item relative to the deletion or addition, even if the deletion or addition references to deduct or add to the Total Base Bid.

**CLARIFICATIONS:**

- **Bid opening date** has been changed to **January 30, 2014, at 9:00 a.m.** in the 1<sup>st</sup> Floor Conference Room, Public Services Building, 320 Fountain Circle, Huntsville, Alabama.
- Last day for Contractors to submit questions for this project has been revised to **Friday, January 24, 2014 until 5:00 p.m.** Response to Contractor questions will be **January 27, 2014, until 5:00 p.m.**

The Star of Alabama

**All addenda are sent via email and recipients are requested to send a confirmation of receipt of all addenda as soon as they are received.** All addenda must be acknowledged either on the outside of the bid envelope or on the second page of your bid proposal known as Attachment "B".

**Attachment: Pre-Bid Minutes**

**END OF ADDENDUM #1**

**CITY OF HUNTSVILLE ENGINEERING DEPARTMENT &  
WATER POLLUTION CONTROL**

**WPC Sanitary Sewer Relocation County Line Road & I-565**

**City of Huntsville Project No. 65-12-SM01**

**ALDOT Project IM565 (307)**

**Garver Project No. 12058060**

**PRE-BID CONFERENCE**

**January 15, 2014 10:00 AM**

**MEETING MINUTES**

**INTRODUCTIONS:**

Penny Kelly – City of Huntsville Engineering Department  
Mary Hollingsworth – City of Huntsville Engineering Department  
Matt Reynolds – City of Huntsville Water Pollution Control Department  
Dana Pollock – Garver, Project Manager  
Michael Malires – Garver, Project Manager

**LIST OF ATTENDEES:**

|                    |                                 |
|--------------------|---------------------------------|
| Sonya Whiting      | Apel Machine & Supply           |
| Chris Latham       | CaMar Construction              |
| Keith Carpenter    | Jordan Excavating               |
| Richard Murphree   | DRM Utilities                   |
| Tim Mayhall        | Reed Contracting Services, Inc. |
| Cindy Johnson      | Russo Corporation               |
| Bruce Jones        | Rast Construction Co.           |
| Tom Hale           | Baird Construction Co.          |
| Penny Kelly        | City of Huntsville              |
| Mary Hollingsworth | City of Huntsville              |
| Matt Reynolds      | City of Huntsville              |
| Shane Cook         | City of Huntsville              |
| Michael Malires    | Garver                          |

**GENERAL DESCRIPTION OF THE PROJECT:**

The work to be performed under this Contract consists of, but is not limited to:

The installation of:

1. Approximately 7,071 LF of Owner-furnished Class 350 16-Inch Ductile-Iron Piping Sanitary Sewer, twenty (20) 48-Inch Sanitary Sewer Manholes, and all required fittings and appurtenances in accordance with the Contract Documents.
2. Two Connections to existing 48-Inch sanitary sewer manholes.
3. One open cut creek crossing including concrete encasement.
4. Approximately 1,873 LF of Owner-furnished Class 250 18-Inch Ductile-Iron Piping Sanitary Forcemain including all required valves and appurtenances in accordance with the Contract Documents.

5. 30-Inch Steel Encasement Jack and Bore Installation approximately 90 LF.
6. Two Connections to existing 18-Inch Forcemain.

**FUNDING:**

The project will be paid for with assistance from the Alabama Department of Transportation (ALDOT).

**BID OPENING:**

- Location: City of Huntsville – Engineering Department First Floor Conference Room
- Time: January 30, 2014 at 9:00 am Central Standard Time (local time, Owner’s clock)
- Requirements: See Advertisement for Bids and Instructions to Bidders
- Note: Please note the “Buy America” requirement included with this project.

**CONTRACT TIME:**

Contract time Per Attachment B “Bid Proposal”:

120 Calendar Days

Contractor’s Questions or Concerns About Schedule?

**BASIS OF AWARD AND OWNER’S BIDDING RIGHTS:**

Owner reserves the right to reject any or all bids, to waive irregularities in the bids and bidding deemed to be in the best interest of the Owner.

Owner reserves the right to reject non-conforming, non-responsive, or conditional bids.

Obviously “unbalanced” bids may be considered non-responsive.

**INTERPRETATIONS:**

Only Addendums can modify the documents.

**ADDENDA:**

Addendum 1 is anticipated to cover pre-bid conference meeting minutes, answers to any questions, and any pay item revisions as a result of the pre-bid conference and questions answered.

**CONTRACT:**

Performance and Payment Bonds required in amount of 100% of the contract award for each bond.

**COORDINATION:**

The ALDOT Project IM565 (307) County Line Road & I-565 Interchange construction began in December 2013. Reed Contracting Services, Inc. is the performing contractor. All prospective bidders shall be aware of this project and shall coordinate all work to be performed within the footprint of this construction project as necessary.

Note that all sanitary sewer and forcemain piping will be constructed in a separate permanent easement outside of ALDOT Right-of-Way.

**APPLICABLE PROJECT PERMITTING:**

**Alabama Department of Environmental Management (ADEM)**

- *Notice of Intent (NOI)* - The contractor is responsible for submitting to ADEM a Notice of Intent (NOI) for construction activities disturbing greater than one (1) acre. Construction of the project cannot begin without submitting an NOI and, if necessary, a Construction Best Management Practices Plan (CBMPP).
- Contractor shall be responsible for submitting the NOI to ADEM as well as submitting a CBMPP, if determined necessary by ADEM.

**United States Army Corps of Engineers (USACE) / Tennessee Valley Authority (TVA)**

- USACE and TVA issued a concurrence letter for this project on October 31, 2012.

**United States Fish and Wildlife Services (USFWS)**

- USFWS issued a concurrence letter for this project on October 11, 2012.

**Alabama Historical Commission**

- Alabama Historical Commission issued a concurrence letter for this project on October 15, 2012.

**FIELD ENGINEERING/SURVEYING:**

Engineer will establish major survey control points and benchmark elevations.

All other surveying work by the Contractor.

Engineer may perform check surveys for layout, grades, elevations, quantities, etc. Contractor shall plan work and coordinate accordingly.

**PROPERTY ACQUISITION:**

All property owners have an agreement in place with the City of Huntsville for easement acquisition. The City anticipates obtaining a Right-of-Entry prior to issuing a Notice to Proceed (NTP).

**DICUSSION ITEMS:**

1. Progress Schedule of Operations should be discussed, as well as erosion control plan, disposal of debris from clearing and grubbing, plan for control of concrete temperature during hot/cold weather, etc. **If the progress report (critical path) is not received, YOUR first pay estimate will NOT BE PROCESSED UNTIL IT IS RECEIVED).**
2. Contractor is required to submit pricing (Attachment "A") on either a 3- ½" floppy disk or CD-RW (preferably in a live/flash drive format) in the Excel format made available for download from the Engineering website. The bid disk or the CD-RW must be in working condition and included with original bid packet and reflect the correct revision, along with two signed hard copies. Failure to do so may be cause for rejection of bid. If a price discrepancy is found on bid disk or CD-RW, or the correct version of bid quantities is not submitted on the disk or CD-RW which corresponds to the printed hard copy, then printed hard copy prices submitted with original bid documents, with Contractor signature, will prevail.
3. The OWNER agrees to pay the contractor as follows: Once each month per project the OWNER shall make partial payment to the Contractor on the basis of duly certified and approved estimates of the work performed during the preceding month by the Contractor, less five per cent (5%) of the amount of such estimate, which is to be retained by the City until all of the work has been performed. Liquidated damages will be deducted from all invoices when the invoice estimate period end date is later than the contract completion date. All pay requests will be submitted by hard copy and on a disk. The hard copy will be printed from the disk. The OWNER will provide the disk to the contractor. Two originals and two copies of the invoices are required before payment will be made. The disk should be submitted each month, along with the originals and copies, to Odessa Sales in the Engineering Department. No further retainage will be held after fifty percent of the contract is complete. All payments to contractor will be made as soon as practical after the approval and finance processes have been completed.
4. State of Alabama classification required shall be stated. Municipal and Utility or Municipal & Utility Specialty Construction MU-(S) Sewer Projects.
5. Sequence of Construction and Traffic Control with the contractor made aware of his/her responsibility to handle traffic safely through the work zone. The method of payment for traffic control shall be discussed and clearly understood.
6. The Prime Contractor should be advised that no work by a subcontractor will be permitted unless approved by contract or in writing. Attachment "C" – "Subcontractor's Listing" in the Supplement to General Requirements for Construction of Public Improvements, City of Huntsville, Alabama has been revised and bidders are advised to pay special attention to the text and instructions listed on the attachment. Contractor shall keep the "Subcontractor's Listing" updated throughout the project duration and submit a copy of the listing with the request for final payment. Noncompliance with this request may cause delay in payment to the Contractor.
7. Anyone working for the Contractor, whether equipment and/or personnel, which are not the Prime Contractors and are not covered by subcontract, then it shall be understood that the Prime Contractor will be required to furnish a rental agreement for the equipment and carry personnel performing such work on his/her labor payroll.

***Bidders' attention is directed to Sections 9, 18, 24E, 46, 48 and 53 in the "Supplement to General Requirements for Construction of Public Improvements" document as posted on the COH website for this project (The underlined statement in Clause #9 was revised 4/9/13):***

**9. LIABILITY INSURANCE (SEE ALSO ATTACHED INSURANCE FOR CONTRACTORS, WHICH IS SHOWN AS SECTION 24.)**

*The Contractor shall provide and maintain comprehensive general public liability insurance protecting the Contractor and the City against claims arising out of or resulting from the Contractor's operation under his contract for personal injury or property damage with minimum combined single limits of \$1,000,000, whether such operations are performed by himself, or by anyone directly or indirectly employed by them. In addition, a copy of the policy may be requested upon award. Certificates of insurance acceptable to the City shall be filed with the City prior to commencement of work and said certificate shall provide that policies will not be altered or canceled until at least 30 days prior written notice has been given to the City.*

*The Contractor shall indemnify and hold the OWNER, its officers and employees harmless from any suits, claims, demands, damages, liabilities, costs and expenses including reasonable attorney's fees, arising out of or resulting from the performance of the work. Certificates of Insurance are required naming the City as the Certificate Holder. The Certificates should reflect the insurance coverage required herein. The Certificates are to be signed by a person authorized by the Insurer to bind coverage on its behalf and must be an original signature. Certificates signed using digital signatures will not be accepted unless accompanied by a written statement from the insurance/surety company indicating that their electronic signature is intended as their signature. The Certificates must indicate coverage will not be canceled or non-renewed except after thirty (30) days prior written notice to the City at the following address: City of Huntsville, P.O. Box 308, Huntsville, Alabama 35804, Attention: Penny Kelly.*

**18. LIQUIDATED DAMAGES**

*It is further understood and agreed by and between the parties to this contract, that in the event the work to be performed under this contract is not completed at the expiration of the contract time, then, and in that event, the Contractor shall pay to the City the amounts per calendar day by the schedule shown in the schedule in the City of Huntsville Standard Specifications, Section 80.11 - "Schedule of Liquidated Damages" for each day thereafter until such work is completed. The City will deduct said sum or sums from any money due the Contractor under this contract for any and all invoices submitted after the contract due date. (See Section 12). Attachment "F" - Sample of Request for Payment with Liquidated Damages shall become a part of the contract documents. Liquidated damages will be deducted from all invoices when the invoice estimate period end date is later than the contract completion date.*

**Section 80.11 - "Schedule of Liquidated Damages" has been amended as follows effective 2/1/11 and revised in COH specifications 3/7/11:**

| <b>Original Contract Amount</b> |                         | <b>Liquidated Damages Daily Charge</b> |                 |
|---------------------------------|-------------------------|----------------------------------------|-----------------|
| <b>More Than</b>                | <b>To and Including</b> | <b>Calendar Day or Fixed Date</b>      | <b>Work Day</b> |
| \$ 0                            | \$ 100,000              | \$ 200                                 | \$ 400          |
| \$ 100,000                      | \$ 500,000              | \$ 550                                 | \$ 1,100        |
| \$ 500,000                      | \$ 1,000,000            | \$ 900                                 | \$ 1,800        |
| \$ 1,000,000                    | \$ 2,000,000            | \$ 1,350                               | \$ 2,700        |
| \$ 2,000,000                    | .....                   | \$ 1,550                               | \$ 3,100        |

*When the contract time is on the calendar day or date basis, the schedule for calendar days shall be used. When the contract time is on a work day basis, the schedule for work days shall be used.*

*Amounts in accordance with ALDOT and COH specifications and is based on contract amount before Change Orders.*

*The underlined statement in Clause #24E is a revised statement effective 4/9/13; special attention is directed to this revision.*

**24E. VERIFICATION OF COVERAGE**

*The Owner shall be indicated as a Certificate Holder and the Contractor shall furnish the Owner with Certificates of Insurance reflecting the coverage required by this document. The A.M. Best Rating and deductibles, if applicable, shall be indicated on the Certificate of Insurance for each insurance policy. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. All certificates are to be received and approved by the Owner before work commences. The Owner reserves the right to require complete, certified copies of all required insurance policies at any time. Certificates signed using digital signatures will not be accepted unless accompanied by a written statement from the insurance/surety company indicating that their electronic signature is intended as their signature.*

**46. SHOP DRAWINGS**

*The approval of shop drawings by the Engineer will cover only the features of the design and in no case shall this approval be considered to cover error or omissions in shop details or a check of any dimensions. The Contractor shall be responsible for the accuracy of the shop drawings, the fabrication of materials and the fit of all connections; and he shall bear the cost of all extra work in erection caused by errors in shop drawings or in fabrication, inaccurate workmanship, misfits of connections or for any changes in fabrication necessary. No work shall be done on the material before the shop drawings have been approved. Any material that the Contractor orders prior to the approval shall be at the Contractor's risk.*

*Substitutions or changes whether indicated or implied on shop drawings will not be considered as changes regardless of the Engineer's approval of shop drawings unless the change has been previously submitted and approved as a change order per the requirements for changes in the contract.*

*After a shop drawing has been approved, no changes shall be made unless directed in writing to the Owner and acceptance by the Owner of said changes. Any acceptance of change by the Owner does not constitute a change to the contract unless that change has been approved and directed in writing per change order. Compensation for preparing and furnishing all shop and working drawings shall be included in the contract unit prices for the various pay items of work.*

**48. E-VERIFY - NOTICE**

*The Beason-Hammon Alabama Taxpayer and Citizen Protection Act, Act No. 2011-535, Code of Alabama (1975) § 31-13-1 through 31-13-30 (also known as and hereinafter referred to as " the Alabama Immigration Act") as amended by Act No. 2012-491 on May 16, 2012 is applicable to all competitively bid contracts with the City of Huntsville. As a condition for the award of a contract and as a term and condition of the contract with the City of Huntsville, in accordance with § 31-13-9 (a) of the*

*Alabama Immigration Act, as amended, any business entity or employer that employs one or more employees shall not knowingly employ, hire for employment, or continue to employ an unauthorized alien within the State of Alabama.*

*During the performance of the contract, such business entity or employer shall participate in the E-Verify program and shall verify every employee that is required to be verified according to the applicable federal rules and regulations. The business entity or employer shall assure that these requirements are included in each subcontract in accordance with §31-13-9(c). Failure to comply with these requirements may result in breach of contract, termination of the contract or subcontract, and possibly suspension or revocation of business licenses and permits in accordance with §31-13-9 (e) (1) & (2). Code of Alabama (1975) § 31-13-9 (k) requires that the following clause be included in all City of Huntsville contracts that have been competitively bid and is hereby made a part of this contract:*

*“By signing this contract the contracting parties affirm, for the duration of the agreement, that they will not violate federal immigration law or knowingly employ, hire for employment, or continue to employ an unauthorized alien within the State of Alabama. Furthermore, a contracting party found to be in violation of this provision shall be deemed in breach of the agreement and shall be responsible for all damages resulting therefrom.”*

*Contractor’s E-Verify Memorandum of Understanding shall be a part of the contract bid documents and shall be submitted with the bid package.*

**53. ALABAMA IMMIGRATION ACT** (Beason-Hammon Alabama Taxpayer and Citizen Protection Act, Act No. 2011-535, Code of Alabama (1975))

*Compliance with the requirements of the (Beason-Hammon Alabama Taxpayer and Citizen Protection Act, Act No. 2011-535, Code of Alabama (1975) § 31-13-1 through 31-13-30, as amended by Alabama Act 2012-241, commonly referred to as the Alabama Immigration Law, is required for City of Huntsville, Alabama contracts that are competitively bid as a condition of the contract performance. The Contractor shall submit in the bid package, with the requested information included on the form, the “City of Huntsville, Alabama Report of Ownership Form” listed in this document as Attachment “H”. The bidder selected for award of the contract may be required to complete additional forms relating to citizenship or alien status of the bidder and its employees, including e-verify information, prior to award of a contract.*

**CLARIFICATIONS:**

1. The contractor selected to execute the work required in this contract shall comply with the “Buy America” requirements discussed in Section 01 09 00 “Special Conditions.” All prospective bidders should be aware of this requirement and shall comply with the Buy America provisions throughout the duration of the contract. The contractor shall certify that materials acquired for this project meet the “Buy America” requirements.
2. Attachment A and Section 01 11 11 Basis of Payment provide the bid items and quantities for this project. Prospective bidders shall bid for “Installation Only” for the sanitary sewer and forcemain piping. The Owner will furnish the piping, mechanical joint gaskets, and field-lock gaskets.
3. Attachment A-1 will include revised quantities issued in Addendum 2 to reflect the information discussed at the pre-bid conference. Note that the ALDOT Pay Item Numbers are NOT applicable for this project. All construction will be in accordance with City of Huntsville standard specifications.
4. The Owner and Engineer require a 72-hour notice for all testing necessary for this project.

5. Pay Item 34 Aid to Construction: Utility Relocation is available only if necessary during construction if any existing utilities are encountered during construction. Surveys and utility locates have been completed and noted on the Drawings; however, this pay item is available should field conditions differ from the plans. Contractor shall provide material invoices and labor rates to the Owner with Pay Request. The Engineer will be responsible for verifying necessary utility relocations and the required material and labor necessary to complete the relocation.
6. Pay Item 35 Reimbursement for Crop Damage: This pay item is reserved for any reimbursement to affected property owners for crop damage due to construction. The City does not anticipate any crop damage due to the time of year construction will occur; however, all compensation for crop damage must be submitted with an invoice detailing the damage occurred and cost for reimbursement.
7. The contractor is responsible for maintaining wastewater flow at the pump station. Any bypass pumping necessary must be coordinated through WPC and is solely the responsibility of the contractor at no additional expense to the Owner or Engineer.

#### **BID SCHEDULE AND INFORMATION**

All questions will be answered and all clarifications made by addendum. **All addenda are sent via email and recipients are requested to send a confirmation of receipt of all addenda as soon as they are received.** Last day for questions concerning this project before the bid will be **January 24, 2014 until 5:00 p.m.** via fax (256) 427-5325 or email to: penny.kelly@huntsvilleal.gov. Response to contractor questions will be **January 27, 2014 until 5:00 p.m.** **Bids open: January 30, 2014 at 9:00 a.m.** in the **1st Floor Conference Room**, 320 Fountain Circle, Huntsville, AL. The pre-bid notes and all addenda shall become a part of the contract documents.



# HUNTSVILLE

Kathy Martin, P.E.  
Director  
City Engineer

Urban Development Department  
Engineering Division

**WPC SANITARY SEWER RELOCATION-COUNTY LINE ROAD & I565**  
**Project No. 65-12-SM01 & ALDOT Project No. IM-I565(307)**  
**January 27, 2014**

**Addendum #2**

All addenda and attachments for the above-referenced project will become part of the contract documents.

**Attachment "A" is amended as follows:**

Replace bid quantities with "replacement", **Attachment "A1"**. Please use the revised attachment to submit bid pricing; **all bids must be submitted using Attachment "A1"**. Contractors are authorized to download revised quantities from website and paste to floppy disk or CD-RW (preferably in a live/flash drive format) of their choice; one or the other must be submitted with the original bid packet. In addition, two hard copies must be signed and submitted with original bid packet. Failure to do so may be cause for rejection of bid. Contractors should be mindful of making changes to formatting already established in column for Bid Unit Price, as it may affect the outcome of their bid. In order to verify calculations are correct, Contractor may choose to manually multiply those unit costs x bid quantities to ensure extensions are correct, prior to printing and submitting with bid packet.

- Any bidder who designates a change on the outside of the envelope understands that any deletions or additions designated, bidder must further indicate the particular bid item relative to the deletion or addition, even if the deletion or addition references to deduct or add to the Total Base Bid.

**REVISIONS TO QUANTITIES:**

**Item No. 16:**

~~645A614 18-Inch Class 250 Forcemain and Required Appurtenances (Installation only of Owner-Furnished Pipe) Piping Appurtenances and Bedding Included 1,873 LF~~

Add: 18-Inch Class 250 Forcemain and Required Appurtenances (Installation only of Owner-Furnished Pipe) Piping Appurtenances and Bedding Included 1,653 LF

The Star of Alabama

**Item No. 22:**

~~Delete 652A100 Temporary and Permanent Grassing 11 AC~~

Add - Temporary and Permanent Grassing 22 AC

**Item No. 24:**

~~Delete 65J002 Silt Fencing 8,942 LF~~

Add - Silt Fencing 8,944 LF

**NEW ITEM:**

Item No. 17: 18-Inch Class 250 Restrained Joint Forcemain and Required Appurtenances (Installation only of Owner-Furnished Pipe) Piping Appurtenances and Bedding Included - 280 - LF

**CLARIFICATIONS:**

ALDOT pay items are NOT applicable to this project and have been deleted from the bid quantities.

**Questions from Contractors:**

- Q. Can the number of days for the contract be extended to 240 days? 120 days is not enough time due to the deep cuts.  
A. The contract will be extended to 150 days.
- Q. Will there be any other charges in addition to the liquidated charges schedule?  
A. No.
- Q. Will night and weekend work be permitted?  
A. Additional work greater than a standard 40 hour work week must be coordinated with the inspector. Any overtime expense incurred by the inspector shall be at the expense of the contractor.
- Q. Who is getting the stormwater permit?  
A. The contractor shall apply for the Notice of Intent (NOI) with the Alabama Department of Environmental Management (ADEM).

- Q.** Will two separate ADEM permits be required since the project is separated by I-565?  
**A.** ADEM will accept one NOI provided the form is properly filed with ADEM detailing the entire scope of the project. ADEM accepts online submittals on the website here:  
<https://app.adem.alabama.gov/eNOI/>
- Q.** Will the contractor be allowed to start the project after filing the NOI, or will they have to wait for the actual permit?  
**A.** Once submitting an online NOI form at the above website, the Permittee will receive an email when Permit coverage has been granted. Construction can begin once permit coverage is granted.
- Q.** Who does the testing, the Owner or the contractor?  
**A.** The contractor will be required to perform the necessary sanitary sewer and manhole testing for this project. The testing must be coordinated with the Water Pollution Control Department with at least a 72-hour advanced notice.
- Q.** Will existing manholes that are to be tied into this project require a vacuum test?  
**A.** No.
- Q.** What material will be furnished by the Owner? Any other material besides the ductile iron pipe such as fittings, valves, restrained joint pipe, polywrap, bedding or casing pipe?  
**A.** The Owner will ONLY furnish the ductile iron pipe and mechanical joint gaskets.
- Q.** It appears the contractor is responsible for furnishing the restrained joints. Will field lock gaskets be sufficient?  
**A.** Yes the contractor is responsible for furnishing the restrained joints. Field Lock gaskets shall only be acceptable for use as restrained joints within the carrier pipe of the steel encasement jack and bore installation. Refer to Addendum 2 for a revised Section 33 00 00 2.2 F of the contract specifications for clarification on the use of restrained joint fittings.
- Q.** Will the ductile iron fittings be required to have epoxy lining (Protecto-401, or approved equal)?  
**A.** No. All ductile iron fittings used for this project shall be cement mortar lined.
- Q.** Who will be responsible for the freight charges for the delivery of the Owner-furnished pipe?  
**A.** In accordance with Specification Section 01 11 00 Part 1.5, Owner will arrange and pay for delivery of Owner-furnished material. The contractor is responsible for off-loading Owner-furnished material and coordinating with the manufacturer for scheduling delivery.
- Q.** Are there any soil borings available for this project?  
**A.** No.

- Q.** Will the Owner add a pay item for rock removal in case the contractor hits rock?
- A.** No additional pay item for rock removal will be added to the contract. All excavation is considered unclassified.
- Q.** Will the gravel drives be considered as roadways and have to be backfilled to the typical for pipe in roadways?
- A.** Yes. Refer to the Standard Details on Sheet 13.
- Q.** Are the Kor-N-Seal flexible pipe connectors acceptable to use for the manholes that are 30 feet deep?
- A.** The Kor-N-Seal "Series 206," or approved equal flexible pipe connectors are acceptable and shall be used for all manholes on this project.
- Q.** Watertight with Vent Sanitary Sewer Manhole, 4' Diameter Standard Precast, will these be a flat top type manhole with lockable hatch as shown on Detail Sheet 11? What type of hatch/cover should be used on the watertight with vent manholes?
- A.** A flat top manhole with standard watertight rim and cover shall be used in place of the lockable hatch. Vent should be mounted on the top of the manhole slab. Refer to SD-23 from the City of Huntsville Design and Acceptance Manual for Sanitary Sewers included in Addendum 2.
- Q.** Sheet 5, Note 2 says, "Contractor to contact and obtain written authorization from billboard owner for work performed within the vicinity of the billboard at no additional cost to the Owner and/or Engineer prior to construction". What if the billboard owner won't give the successful bidder written permission?
- A.** All affected property owners have reached an agreement with the Owner for work to be performed within the proposed easements. In lieu of obtaining written permission from the billboard owner, Note 2 shall be revised to require "Contractor to contact and inform billboard owner of work to be performed. Care shall be taken during construction activities in the immediate vicinity of the billboard. Any billboard damage resulting from construction activities shall be repaired by the contractor at no additional expense to the Owner and/or Engineer."
- Q.** Sheets 9 and 10, Note 7 identifies a Design Pressure of 250 psi. Sheet 14, Note 1 on the Restrained Joint Detail requires a Test Pressure of 150 psi. What test pressure is required?
- A.** 150 psi.
- Q.** There are two creek crossing details on Sheet 11. Which detail does the contractor price by?
- A.** Shallow Creek Crossing Detail which includes concrete encasement.

- Q.** Sheet 14, Note 3 – Restrained Joint Detail – says length of restrained joint is based on installation in “SP Soils.” Who will classify the soil? What if the soil is different than SP soil? Who will be responsible for paying for the additional restrained joints if it is found that more are needed due to the actual soil type?
- A.** The Restrained Joint Detail on Sheet 14 shall be considered to be a minimum requirement for length of restrained joint fittings necessary. Addendum 2 includes a revised list of bid items “Attachment A-1” and includes a pay item for restrained joint forcemain which will be revised during construction if additional restrained joints are determined to be necessary.
- Q.** The project calls for digital as-built drawings. Will the Owner provide the plans digitally to be modified or is the expectation that a brand new survey/drawing be required? If so, please provide extents and elements to be shown (i.e. easement boundaries, profiles, lateral limits of the in-place pipe, etc.)
- A.** The Engineer will provide a digital copy of the design drawings to the contractor upon the award of the contract.
- Q.** The quantity sheet lists COH specifications #646, #647, and #648. In the digital copy of the City of Huntsville’s Standard Specifications for Construction of Public Works Improvements, Contract Projects there is no Section #646 listed. Please clarify.
- A.** Please refer to Sections #646, #647, and #648 in the City of Huntsville Design and Acceptance Manual for Sanitary Sewers.

**All addenda are sent via email and recipients are requested to send a confirmation of receipt of all addenda as soon as they are received.** All addenda must be acknowledged either on the outside of the bid envelope or on the second page of your bid proposal known as Attachment “B”.

**Attachments: Revised Attachment “A-1”  
Specification Section 01 11 11 – Basis of Payment  
Specification Section 33 00 00 - Pipe and Fittings  
Standard Detail SD-23 from the COH Sanitary Sewer Design and Acceptance  
Manual**

**END OF ADDENDUM #2**

| ATTACHMENT A-1                                                                                         |                                                                                                                                                    | 1/27/2014 |                |            |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------|------------|
| COUNTY LINE ROAD & I-565 SANITARY SEWER RELOCATION<br>PROJECT NOS. 65-12-SM01 & ALDOT NO. IM-1565(307) |                                                                                                                                                    |           |                |            |
| ITEM NO.                                                                                               | DESCRIPTION                                                                                                                                        | BID QTY   | BID UNIT PRICE | BID AMOUNT |
| 1                                                                                                      | Mobilization, Demobilization, Bonds, Insurance, Including Clearing and Grubbing and Traffic Control (Not to Exceed 5% of the Total Base Bid Price) | 1         | LS             | \$0.00     |
| 2                                                                                                      | Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 0' to 6' deep, Complete In-Place PER C.O.H. SPECIFICATION #646, #647, & #648                | 1         | EA             | \$0.00     |
| 3                                                                                                      | Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 6' to 12' deep, Complete In-Place PER C.O.H. SPECIFICATION #646, #647, & #648               | 4         | EA             | \$0.00     |
| 4                                                                                                      | Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 12' to 18' deep, Complete In-Place PER C.O.H. SPECIFICATION #646, #647, & #648              | 1         | EA             | \$0.00     |
| 5                                                                                                      | Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 18' to 24' deep, Complete In-Place PER C.O.H. SPECIFICATION #646, #647, & #648              | 6         | EA             | \$0.00     |
| 6                                                                                                      | Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 24' to 30' deep, Complete In-Place PER C.O.H. SPECIFICATION #646, #647, & #648              | 2         | EA             | \$0.00     |
| 7                                                                                                      | Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 30' to 36' deep, Complete In-Place PER C.O.H. SPECIFICATION #646, #647, & #648              | 3         | EA             | \$0.00     |
| 8                                                                                                      | Watertight Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 6' to 12' deep, Complete In-Place PER C.O.H. SPECIFICATION #646, #647, & #648    | 1         | EA             | \$0.00     |

| ATTACHMENT A-1                                     |                                                                                                                                                                                                                   |         |          | 1/27/2014      |            |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------|----------------|------------|
| COUNTY LINE ROAD & I-565 SANITARY SEWER RELOCATION |                                                                                                                                                                                                                   |         |          |                |            |
| PROJECT NOS. 65-12-SM01 & ALDOT NO. IM-1565(307)   |                                                                                                                                                                                                                   |         |          |                |            |
| ITEM NO.                                           | DESCRIPTION                                                                                                                                                                                                       | BID QTY | BID UNIT | BID UNIT PRICE | BID AMOUNT |
| 9                                                  | Watertight with Vent Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 6' to 12' deep, Complete In-Place PER C.O.H. SPECIFICATION #646, #647, & #648                                                         | 2       | EA       |                | \$0.00     |
| 10                                                 | 16-Inch Class 350 DIP Gravity Sewer and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included (Depth of Cover 10 feet or less) PER C.O.H. SPECIFICATION #645, #646, #647, & #648    | 1,571   | LF       |                | \$0.00     |
| 11                                                 | 16-Inch Class 350 DIP Gravity Sewer and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included (Depth of Cover 10 feet to 20 feet) PER C.O.H. SPECIFICATION #645, #646, #647, & #648 | 1,426   | LF       |                | \$0.00     |
| 12                                                 | 16-Inch Class 350 DIP Gravity Sewer and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included (Depth of Cover 20 feet to 30 feet) PER C.O.H. SPECIFICATION #645, #646, #647, & #648 | 2,948   | LF       |                | \$0.00     |
| 13                                                 | 16-Inch Class 350 DIP Gravity Sewer and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included (Depth of Cover 30 feet to 40 feet) PER C.O.H. SPECIFICATION #645, #646, #647, & #648 | 1,126   | LF       |                | \$0.00     |
| 14                                                 | Inside Drop Manhole Connection to Existing Sanitary Sewer Manhole                                                                                                                                                 | 1       | EA       |                | \$0.00     |
| 15                                                 | Connection to Existing Sanitary Sewer Manhole                                                                                                                                                                     | 1       | EA       |                | \$0.00     |

| ATTACHMENT A-1                                     |                                                                                                                                                               |         |          |                |            | 1/27/2014 |  |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------|----------------|------------|-----------|--|
| COUNTY LINE ROAD & I-565 SANITARY SEWER RELOCATION |                                                                                                                                                               |         |          |                |            |           |  |
| PROJECT NOS. 65-12-SM01 & ALDOT NO. IM-1565(307)   |                                                                                                                                                               |         |          |                |            |           |  |
| ITEM NO.                                           | DESCRIPTION                                                                                                                                                   | BID QTY | BID UNIT | BID UNIT PRICE | BID AMOUNT |           |  |
| 16                                                 | 18-Inch Class 250 Forcemain and Required Appurtenances (Installation only of Owner-Furnished Pipe) Piping Appurtenances and Bedding Included                  | 1,653   | LF       |                | \$0.00     |           |  |
| 17                                                 | 18-Inch Class 250 Restrained Joint Forcemain and Required Appurtenances (Installation only of Owner-Furnished Pipe) Piping Appurtenances and Bedding Included | 280     | LF       |                | \$0.00     |           |  |
| 18                                                 | 18-Inch Gate Valve and Required Appurtenances                                                                                                                 | 1       | EA       |                | \$0.00     |           |  |
| 19                                                 | 18-Inch DIP-RJ 11 1/4 Degree Bend, Thrust Block and Required Appurtenances                                                                                    | 1       | EA       |                | \$0.00     |           |  |
| 20                                                 | 18-Inch DIP-RJ 45 Degree Bend, Thrust Block and Required Appurtenances                                                                                        | 4       | EA       |                | \$0.00     |           |  |
| 21                                                 | Connection to Existing 18-Inch DIP Forcemain                                                                                                                  | 2       | EA       |                | \$0.00     |           |  |
| 22                                                 | Site Restoration to include grading, topsoil, and preparation for seed on all disturbed areas.                                                                | 11      | AC       |                | \$0.00     |           |  |
| 23                                                 | Temporary and Permanent Grassing                                                                                                                              | 22      | AC       |                | \$0.00     |           |  |

| <b>ATTACHMENT A-1</b>                                         |                                                                                                                                                                   |                |                 |                       |                   | <b>1/27/2014</b> |  |
|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|-----------------------|-------------------|------------------|--|
| <b>COUNTY LINE ROAD &amp; I-565 SANITARY SEWER RELOCATION</b> |                                                                                                                                                                   |                |                 |                       |                   |                  |  |
| <b>PROJECT NOS. 65-12-SM01 &amp; ALDOT NO. IM-1565(307)</b>   |                                                                                                                                                                   |                |                 |                       |                   |                  |  |
| <b>ITEM NO.</b>                                               | <b>DESCRIPTION</b>                                                                                                                                                | <b>BID QTY</b> | <b>BID UNIT</b> | <b>BID UNIT PRICE</b> | <b>BID AMOUNT</b> |                  |  |
| <b>24</b>                                                     | Class II Rip-Rap Replacement                                                                                                                                      | 300            | TON             |                       | \$0.00            |                  |  |
| <b>25</b>                                                     | Silt Fencing                                                                                                                                                      | 8,944          | LF              |                       | \$0.00            |                  |  |
| <b>26</b>                                                     | Additional Erosion Control per Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas, March 2009 | 1              | LS              |                       | \$0.00            |                  |  |
| <b>27</b>                                                     | Open Cut Creek Crossing (Including Concrete Encasement)                                                                                                           | 1              | LS              |                       | \$0.00            |                  |  |
| <b>28</b>                                                     | 30-Inch Steel Encasement Jack and Bore Installation (w/ 90 LF 18-Inch CL 250 DIP-RJ)                                                                              | 90             | LF              |                       | \$0.00            |                  |  |
| <b>29</b>                                                     | Remove and Replace Existing Gravel Drive                                                                                                                          | 500            | TON             |                       | \$0.00            |                  |  |
| <b>30</b>                                                     | Vacuum Testing for Manhole (Material and Installation)                                                                                                            | 20             | EA              |                       | \$0.00            |                  |  |
| <b>31</b>                                                     | Abandon Sanitary Sewer Line at County Line Road Pump Station                                                                                                      | 21             | LF              |                       | \$0.00            |                  |  |

| ATTACHMENT A-1                                                                                                                                 |                                                |         |          |                |             |                    | 1/27/2014 |
|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------|----------|----------------|-------------|--------------------|-----------|
| COUNTY LINE ROAD & I-565 SANITARY SEWER RELOCATION                                                                                             |                                                |         |          |                |             |                    |           |
| PROJECT NOS. 65-12-SM01 & ALDOT NO. IM-I565(307)                                                                                               |                                                |         |          |                |             |                    |           |
| ITEM NO.                                                                                                                                       | DESCRIPTION                                    | BID QTY | BID UNIT | BID UNIT PRICE | BID AMOUNT  |                    |           |
| 32                                                                                                                                             | Sewer Line Testing (Material and Installation) | 7,071   | LF       |                | \$0.00      |                    |           |
| 33                                                                                                                                             | Forcemain Testing (Material and Installation)  | 1,873   | LF       |                | \$0.00      |                    |           |
| 34                                                                                                                                             | Digital As-Built Drawings                      | 1       | LS       |                | \$0.00      |                    |           |
| 35                                                                                                                                             | Aid to Construction: Utility Relocation        | 1       | LS       | \$50,000.00    | \$50,000.00 |                    |           |
| 36                                                                                                                                             | Reimbursement for Crop Damage                  | 1       | LS       | \$10,000.00    | \$10,000.00 |                    |           |
| <b>TOTAL BASE BID AMOUNT</b>                                                                                                                   |                                                |         |          |                |             | <b>\$60,000.00</b> |           |
| Company _____                                                                                                                                  |                                                |         |          |                |             |                    |           |
| Signature _____                                                                                                                                |                                                |         |          |                |             |                    |           |
| Date _____                                                                                                                                     |                                                |         |          |                |             |                    |           |
| <b>ALL ITEMS SHALL BE CONSIDERED IN-PLACE. UNIT PRICE SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT AND REMOVAL REQUIRED FOR CONSTRUCTION.</b> |                                                |         |          |                |             |                    |           |

SECTION 01 11 11 - BASIS OF PAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for unit prices.
- B. Related Sections include the following:
  - 1. Division 00 General Conditions - "City of Huntsville Supplement to General Requirements for Construction of Public Improvements" for Owner quantity and unit pricing requirements.
  - 2. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
  - 3. Division 01 Section "Quality Requirements" for general testing and inspecting requirements.

1.3 DEFINITIONS

- A. Unit price is stated on the Bid Quantities Form a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead and profit.
- B. Measurement and Payment: Refer to Part 3 of this Section for establishment of unit prices. Methods of measurement and payment for unit prices are specified in Part 3.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

PART 2 - PRODUCTS (Not Used)

PART 3 - MEASUREMENT AND PAYMENT

3.1 GENERAL

- A. The Contractor shall receive and accept the compensation provided in the Proposal and the Contract as full payment for: furnishing all materials, labor, tools and equipment; performing all operations necessary to complete the work and equipment; performing all operations necessary to complete the work under the Contract; all loss or damages arising from the nature of the Work, or from any discrepancy between the actual quantities of work and quantities herein estimated by the Engineer, or from the action of the elements or from any unforeseen difficulties which may be encountered during the prosecution of the Work until the final acceptance by the Owner.
- B. The prices stated in the Proposal include all costs and expenses for taxes, labor, equipment, materials, commissions, transportation charges and expenses, patent fees and royalties, labor for handling materials during inspection, together with any and all other costs and expenses for performing and completing the Work as shown on the Drawings and specified herein. The basis of payment for an item at the unit price shown in the Proposal shall be in accordance with the description of that item in this Section.
- C. The Contractor's attention is again called to the fact that the quotations for the various items of work are intended to establish a total price for completing the Work in its entirety. Should the Contractor think that the cost for any item of work has not been established by the Bid Form or Payment Items, he shall include the cost for that work in some other applicable bid item, so that his proposal for the Project does reflect his total price for completing the Work in its entirety.

3.2 BASIS OF PAYMENT

A. General

- 1. The "Owner" shall refer to the City of Huntsville's Engineering Department and/or Water Pollution Control.
- 2. Contractor shall be responsible to repair any damage to those items not designated for demolition or removal in a manner satisfactory to the Owner at no additional cost to the Owner.
- 3. The Owner reserves the right to make reasonable changes in line locations without extra cost, except as may be determined by extra units of materials and construction actually involved.
- 4. At completion of project, deliver record documents and plan view drawing to Owner. Record Drawings must be submitted and approved prior to acceptance of the utility into the public system. APPROVAL FOR FINAL PAYMENT WILL BE CONTINGENT UPON COMPLIANCE WITH THESE PROVISIONS.

B. Subsurface Investigation

1. No separate pay item shall be included for subsurface investigation. Test borings and other exploratory operations conducted by the Contractor will be at no cost to the Owner.

C. Excavation

1. All excavation of materials shall be included in the unit bid price, unless otherwise specified on the Drawings or in the bid proposal.
2. All excavation will be unclassified and no additional payment will be made.
3. Unauthorized excavation, as well as remedial work directed by the Owner or the Owner's Representative, shall be at Contractor's expense.
4. No compensation will be allowed for additional excavation necessary for establishing stable subgrade; it shall be included in the unit bid price.
5. Dispose of excess soil material and waste materials in a legal manner per the Owner's direction at no additional cost to the Owner.
6. Pavement shall be sawcut without extra compensation to the Contractor.
7. Sheeting and shoring of trenches shall be provided at the Contractor's expense. In the event the Owner directs the Contractor to leave shoring materials in place, the Owner will reimburse the Contractor for the reasonable cost of leaving such materials in place.
8. Should the lack of a solid vertical excavation face occur due to improper trench excavation, the entire cost of furnishing and installing metal harness anchorages in excess of the Contract value of the contract blocking replaced by such anchorages shall be borne by the Contractor.

D. Rock Removal

1. All excavation of any nature shall be unclassified and payment for the same shall be included in the unit price of other items of work.

E. Dewatering

1. Dewatering of all excavations shall be the responsibility of the Contractor, and no additional compensation shall be allowed. The presence of groundwater and surface water should be accounted for in the base bid price.

F. Pipe

1. Measurement shall be on the basis of linear feet along the centerline of the pipe.
2. Payment shall be as specified in Section 3.4.
3. Work under these items includes, but is not limited to, trenching, bedding, backfilling, solid rock removal, hauling and disposal of bedding and waste material, cleanup, site restoration, and any work included in the Contract not covered by other items on the Bid Form.
4. Payment for fittings is not included in this pay item.

**G. Backfill and Fill**

1. Pipe bedding and trench stabilization are not considered separate pay items, regardless of amount or material required.
2. No additional compensation will be allowed for deep trenches unless otherwise specified.
3. The use of off-site borrow material for use as non-structural fill shall not result in additional compensation for the Contractor.
4. Earth, Class I, and Class II material used in final backfill is not a separate pay item.
5. The Contractor shall receive no extra payment for the filling in of settled or washed areas.
6. Excavated materials from trenches in excess of the quantity required for trench backfill, shall be disposed of by the Contractor at no additional cost to the Owner
7. When not shown as a bid item, controlled low-strength (CLSM) or flowable backfill will not be measured for separate payment but the cost thereof shall be included in the price bid for the appropriate item. Such price shall be full compensation for furnishing and installing flowable backfill and for all materials, labor, tools, equipment and incidentals necessary to complete the work.

**H. Testing**

1. Cost associated with testing pipe and manholes should be included in Contractor's base bid as shown Section 3.4 "Payment Items."
2. Should the sections under test fail to meet the requirements, the Contractor shall do all work of locating and repairing the leaks and re-testing as the Owner or Owner's Representative may require without additional compensation.
3. All pipe that does not pass the deflection test shall be replaced so that they do pass, at no cost to the Owner.
4. All testing requirements for the pump station shall be included for the pump station bid item included in the bid proposal.

**I. Maintaining Wastewater Flow**

1. No direct payment shall be made to the Contractor for this item. The Contractor shall include the cost of this work in other bid items, unless specified in the Contract Documents.
2. All repairs, replacements, and rebuilding caused by wastewater flow control operations shall be paid for by the Contractor.

**J. Line Markers**

1. All line markers required shall be included in the unit price of other items of work.

**3.3 MEASUREMENT**

- A.** The quantities for payment under this Contract shall be determined by actual measurement of the completed items, in place, ready for service and accepted by the Owner, in accordance with the applicable method of measurement therefore contained herein.

3.4 PAYMENT ITEMS

- A. The following will clarify the work included for bid items in Attachment A (Bid Quantities) of the Contract Documents:
1. Mobilization, Demobilization, Bonds, Insurance, Including Clearing and Grubbing and Traffic Control (Not to exceed 5% of the Total Base Bid Price):
    - a. Measurement for required mobilization and demobilization will be based on the Contract unit price of one lump sum to compensate for the mobilization/demobilization as needed to meet the Contract requirements.
    - b. Payment for required mobilization will be based on the Contract unit price of one lump sum to compensate for the mobilization as needed to meet the Contract requirements.
    - c. Bonds & Insurance for this project.
    - d. Clearing & Grubbing: Clearing and grubbing will be made at a lump sum price to be included in this pay item for all required material and installation to meet the Contract requirements. Price and payment shall be full compensation for all required materials and labor to meet the Contract requirements.
    - e. Traffic Control: Traffic Control shall be included in the lump sum price for mobilization. This lump sum shall compensate all required traffic control throughout duration of project.
  2. Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 0' to 6' deep, Complete-In-Place Per COH Specification #646, #647 and #648.
    - a. Measurement for all manholes will be made at the Contract unit price per each manhole for the size and depth installed.
    - b. Payment for each manhole shall include all necessary materials including frame, cover, rim, and all necessary appurtenances for a complete and working manhole.
  3. Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 6' to 12' deep, Complete-In-Place Per COH Specification #646, #647 and #648.
    - a. Measurement for all manholes will be made at the Contract unit price per each manhole for the size and depth installed.
    - b. Payment for each manhole shall include all necessary materials including frame, cover, rim, and all necessary appurtenances for a complete and working manhole.
  4. Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 12' to 18' deep, Complete-In-Place Per COH Specification #646, #647 and #648.
    - a. Measurement for all manholes will be made at the Contract unit price per each manhole for the size and depth installed.
    - b. Payment for each manhole shall include all necessary materials including frame, cover, rim, and all necessary appurtenances for a complete and working manhole.

5. Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 18' to 24' deep, Complete-In-Place Per COH Specification #646, #647 and #648.
  - a. Measurement for all manholes will be made at the Contract unit price per each manhole for the size and depth installed.
  - b. Payment for each manhole shall include all necessary materials including frame, cover, rim, and all necessary appurtenances for a complete and working manhole.
6. Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 24' to 30' deep, Complete-In-Place Per COH Specification #646, #647 and #648.
  - a. Measurement for all manholes will be made at the Contract unit price per each manhole for the size and depth installed.
  - b. Payment for each manhole shall include all necessary materials including frame, cover, rim, and all necessary appurtenances for a complete and working manhole.
7. Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 30' to 36' deep, Complete-In-Place Per COH Specification #646, #647 and #648.
  - a. Measurement for all manholes will be made at the Contract unit price per each manhole for the size and depth installed.
  - b. Payment for each manhole shall include all necessary materials including frame, cover, rim, and all necessary appurtenances for a complete and working manhole.
8. Watertight Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 6' to 12' deep, Complete-In-Place Per COH Specification #646, #647 and #648.
  - a. Measurement for all manholes will be made at the Contract unit price per each manhole for the size and depth installed.
  - b. Payment for each manhole shall include all necessary materials including frame, cover, watertight rim, and all necessary appurtenances for a complete and working manhole.
9. Watertight with Vent Sanitary Sewer Manhole, 4' Diameter, Standard Precast, 6' to 12' deep, Complete-In-Place Per COH Specification #646, #647 and #648.
  - a. Measurement for all manholes will be made at the Contract unit price per each manhole for the size and depth installed.
  - b. Payment for each manhole shall include all necessary materials including frame, cover, watertight rim, manhole vent, and all necessary appurtenances for a complete and working manhole.
10. 16-Inch Class 350 DIP Gravity Sewer and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included (Depth of Cover 10 feet or less):
  - a. Measurement of pipe, except as otherwise specified will be based on the laying length of the actual piping in linear feet actually placed as measured along the

- centerline of the pipe, including the length of fittings and specials measured along their centerlines.
- b. Payment for pipe will be made at the Contract unit price per linear foot for the size and type installed, which price and payment shall be full compensation for all fittings, excavation, dewatering, pipe bedding, backfill and compaction, site restoration, polyethylene polywrap, metallic locate tape, and for all equipment and all other work necessary to complete the Contract requirements.
  - c. This payment item includes installation ONLY of Owner-furnished 16-inch DIP gravity sewer piping to complete the Contract requirements.
11. 16-Inch Class 350 DIP Gravity Sewer and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included (Depth of Cover 10 feet to 20 feet):
- a. Measurement of pipe, except as otherwise specified will be based on the laying length of the actual piping in linear feet actually placed as measured along the centerline of the pipe, including the length of fittings and specials measured along their centerlines.
  - b. Payment for pipe will be made at the Contract unit price per linear foot for the size and type installed, which price and payment shall be full compensation for all fittings, excavation, dewatering, pipe bedding, backfill and compaction, site restoration, polyethylene polywrap, metallic locate tape, and for all equipment and all other work necessary to complete the Contract requirements.
  - c. This payment item includes installation ONLY of Owner-furnished 16-inch DIP gravity sewer piping to complete the Contract requirements.
12. 16-Inch Class 350 DIP Gravity Sewer and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included (Depth of Cover 20 feet to 30 feet):
- a. Measurement of pipe, except as otherwise specified will be based on the laying length of the actual piping in linear feet actually placed as measured along the centerline of the pipe, including the length of fittings and specials measured along their centerlines.
  - b. Payment for pipe will be made at the Contract unit price per linear foot for the size and type installed, which price and payment shall be full compensation for all fittings, excavation, dewatering, pipe bedding, backfill and compaction, site restoration, polyethylene polywrap, metallic locate tape, and for all equipment and all other work necessary to complete the Contract requirements.
  - c. This payment item includes installation ONLY of Owner-furnished 16-inch DIP gravity sewer piping to complete the Contract requirements.
13. 16-Inch Class 350 DIP Gravity Sewer and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included (Depth of Cover 30 feet to 40 feet):
- a. Measurement of pipe, except as otherwise specified will be based on the laying length of the actual piping in linear feet actually placed as measured along the centerline of the pipe, including the length of fittings and specials measured along their centerlines.

- b. Payment for pipe will be made at the Contract unit price per linear foot for the size and type installed, which price and payment shall be full compensation for all fittings, excavation, dewatering, pipe bedding, backfill and compaction, site restoration, polyethylene polywrap, metallic locate tape, and for all equipment and all other work necessary to complete the Contract requirements.
    - c. This payment item includes installation ONLY of Owner-furnished 16-inch DIP gravity sewer piping to complete the Contract requirements.
- 14. Inside Drop Manhole Connection to Existing Sanitary Sewer Manhole:
  - a. Measurement for inside drop manhole connection to existing sanitary sewer manhole will be made at the Contract unit price per each inside drop manhole connection to provide full compensation as needed to meet the Contract requirements.
  - b. Payment for inside drop manhole connection to existing sanitary sewer manhole will be made at the Contract unit price per each inside drop connection to provide full compensation for the new connection as needed to meet the Contract requirements, which price and payment shall be full compensation for all material and equipment required.
- 15. Connection to Existing Sanitary Sewer Manhole:
  - a. Measurement for the connection to an existing sanitary sewer manhole will be made at the Contract unit price per each manhole connection to provide full compensation as needed to meet the Contract requirements.
  - b. Payment for the connection to existing sanitary sewer manhole will be made at the Contract unit price per each connection to provide full compensation for the new connection as needed to meet the Contract requirements, which price and payment shall be full compensation for all material and equipment required.
- 16. 18-Inch Class 250 DIP Forcemain and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included:
  - a. Measurement of pipe, except as otherwise specified will be based on the laying length of the actual piping in linear feet actually placed as measured along the centerline of the pipe, including the length of fittings and specials measured along their centerlines.
  - b. Payment for pipe will be made at the Contract unit price per linear foot for the size and type installed, which price and payment shall be full compensation for all mechanical joint fittings, restrained joint fittings, excavation, dewatering, pipe bedding, backfill and compaction, site restoration, polyethylene polywrap, metallic locate tape, removal and replacement of existing fencing, and for all equipment and all other work necessary to complete the Contract requirements.
  - c. This payment item includes installation ONLY of Owner-furnished 18-inch DIP forcemain piping to complete the Contract requirements.

17. 18-Inch Class 250 Restrained Joint DIP Forcemain and Required Appurtenances (Installation Only of Owner-Furnished Pipe) Bedding Included:
  - a. Measurement of restrained joint pipe, except as otherwise specified will be based on the laying length of the actual restrained joint piping in linear feet actually placed as measured along the centerline of the pipe, including the length of fittings and specials measured along their centerlines.
  - b. Payment for restrained joint pipe will be made at the Contract unit price per linear foot for the size and type installed, which price and payment shall be full compensation for all mechanical joint fittings, restrained joint fittings, excavation, dewatering, pipe bedding, backfill and compaction, site restoration, polyethylene polywrap, metallic locate tape, removal and replacement of existing fencing, and for all equipment and all other work necessary to complete the Contract requirements.
  - c. This payment item includes installation ONLY of Owner-furnished 18-inch DIP forcemain restrained joint piping to complete the Contract requirements.
  
18. 18-Inch Gate Valve and Required Appurtenances
  - a. Measurement and payment for gate valves will be made at the Contract unit price of each gate valve, valve box and all other required appurtenances installed for all required material and installation to meet the Contract requirements.
  - b. Payment for gate valves, except as otherwise specified, will be based on number of installed gate valves, valve boxes and all other required appurtenances. The contractor is responsible for installation of all necessary materials and required appurtenances and Price and payment shall be full compensation for all required materials and labor to complete the installation to meet the Contract requirements.
  
19. 18-Inch DIP-RJ 11¼ Degree Bend, Thrust Block and Required Appurtenances:
  - a. Measurement for all 11¼ degree bends will be made at the Contract unit price per 11¼ degree bend for the size and type installed.
  - b. Payment for all 11¼ degree bends will be made at the Contract unit price per 11¼ degree bend for the size and type installed, which price and payment shall be full compensation for bend, restrained joint fittings, thrust block and all other required materials and labor to meet the Contract requirements.
  
20. 18-Inch DIP-RJ 45 Degree Bend, Thrust Block and Required Appurtenances:
  - a. Measurement for all 45 degree bends will be made at the Contract unit price per 45 degree bend for the size and type installed.
  - b. Payment for all 45 degree bends will be made at the Contract unit price per 45 degree bend for the size and type installed, which price and payment shall be full compensation for bend, restrained joint fittings, thrust block and all other required materials and labor to meet the Contract requirements.

21. Connection to Existing 18-Inch DIP Forcemain:
  - a. Measurement for the connection to an existing 18-Inch DIP forcemain will be made at the Contract unit price per each forcemain connection to provide full compensation as needed to meet the Contract requirements.
  - b. Payment for the connection to existing 18-Inch DIP forcemain will be made at the Contract unit price per each connection to provide full compensation for the new connection as needed to meet the Contract requirements, which price and payment shall be full compensation for all material, appurtenances and equipment required.
22. Site Restoration to include grading, topsoil, and preparation for seed on all disturbed areas.
  - a. Measurement for site restoration will be made at the Contract unit price per acre for all required material and installation to meet the Contract requirements.
  - b. Payment for site restoration, except as otherwise specified, will be based on the unit price per acre required for site restoration. Price and payment shall be full compensation for all required materials and labor to meet the Contract requirements.
23. Temporary and Permanent Grassing:
  - a. Measurement for temporary and permanent grassing shall be made at the Contract unit price per acre for all required seed, fertilizer, mulch and any other material or labor necessary to meet the Contract requirements.
  - b. Payment for temporary and permanent grassing, except as otherwise specified, will be based on the unit price per acre required for seed, fertilizer and mulch and any other material or labor necessary to meet the Contract requirements. Price and payment shall be full compensation for all required materials and labor to meet the Contract requirements.
24. Class II Rip-Rap Replacement:
  - a. Measurement for rip-rap replacement shall be made at the Contract unit price per lump sum for all required material and installation to meet the Contract requirements.
  - b. Payment for rip-rap replacement, except as otherwise specified, will be based on the lump sum price required for all required materials and labor to meet the Contract requirements.
25. Silt Fencing:
  - a. Measurement for silt fencing will be made at the Contract unit price per linear foot for all required material and installation to meet the Contract requirements.
  - b. Payment for silt fencing, except as otherwise specified, will be based on the unit price per linear foot required for silt fencing. Price and payment shall be full compensation for all required materials and labor to meet the Contract requirements.

26. Additional Erosion Control per Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas, March 2009:
  - a. Measurement for additional erosion control will be made at the Contract Lump Sum price for all required additional erosion control materials and labor to meet the Contract requirements.
  - b. Payment for erosion control, except as otherwise specified, will be made at the Contract Lump Sum price required for additional erosion control. Price and payment shall be full compensation for all required materials and labor to meet the Contract requirements.
  - c. This pay item includes all additional erosion control measures necessary (other than silt fencing) to complete the requirements of the Work for this contract.
27. Open Cut Creek Crossing (Including Concrete Encasement):
  - a. Measurement for open cut creek crossing will be made at the Contract unit price per linear foot of creek open cut, which price and payment shall be full compensation for all material, equipment and labor required to meet the Contract requirements.
  - b. Payment for open cut creek crossing will be made at the Contract unit price per linear foot of creek open cut, which price and payment shall be full compensation for all material, equipment and labor required to meet the Contract requirements.
28. 30-Inch Steel Encasement Jack and Bore Installation (w/ 90 LF 18-Inch CL 250 DIP-RJ):
  - a. Measurement for steel encasement installation will be based on the laying length of encasement in linear feet actually placed as measured along the centerline of the completed encasement.
  - b. Payment for steel encasement installation will be based on the laying length of encasement in linear feet actually placed as measured along the centerline of the completed encasement, which price and payment shall be full compensation for all casing spacers, loading of carrier pipe in steel encasement and for all equipment and all other work necessary to complete the Contract requirements.
29. Remove and Replace Existing Gravel Drive
  - a. Measurement for removing and replacing existing gravel drive will be made at the Contract unit price per ton of gravel drive removed and replaced, which price and payment shall be full compensation for all material, equipment and labor required to meet the Contract requirements.
  - b. Payment for removing and replacing existing gravel drive will be made at the Contract unit price per ton of gravel drive removed and replaced, which price and payment shall be full compensation for all material, equipment and labor required to meet the Contract requirements.
  - c. Measurement and payment for removing and replacing existing gravel drive is based on replacing existing gravel drive with a four (4) inch thick gravel drive. Removal and replacement of existing gravel drive shall be made in like kind.

30. Vacuum Testing For Manhole (Material and Installation):
  - a. Measurement for testing manholes, except as otherwise specified will be based on the contract unit price for each manhole tested as required in the contract documents.
  - b. Payment for testing manholes, except as otherwise specified will be based on the contract unit price for each manhole tested as required in the contract documents.
31. Abandon Sanitary Sewer Line at County Line Road Pump Station:
  - a. Measurement for sanitary sewer line abandonment, except as otherwise specified will be based on the contract unit price per linear foot of sanitary sewer line abandoned as required in the contract documents.
  - b. Payment for sanitary sewer line abandonment, except as otherwise specified will be based on the contract unit price per linear foot of sanitary sewer line abandoned as required in the contract documents.
32. Sewer Line Testing (Material and Installation):
  - a. Measurement for testing sewer lines, except as otherwise specified will be based on the length of the pipe tested in accordance with the contract documents.
  - b. Payment for testing sewer lines, except as otherwise specified will be based on the length of the pipe tested in accordance with the contract documents.
33. Forcemain Testing (Material and Installation):
  - a. Measurement for testing forcemain, except as otherwise specified will be based on the length of the pipe tested in accordance with the contract documents.
  - b. Payment for testing forcemain, except as otherwise specified will be based on the length of the pipe tested in accordance with the contract documents.
34. Digital As-Built Drawings:
  - a. Measurement and payment for all required As-Built Drawings will be based on a lump sum to provide full compensation for all required Digital As-Built Drawings documenting the construction of the Work outlined in this Contract.
  - b. Payment for Digital As-Built Drawings will be based on the Contract lump sum price for all required As-Built Drawings documenting the construction of the Work outlined in this Contract.
35. Aid-To-Construction: Utility Relocation
  - a. Measurement and payment for Aid-to-Construction shall be based on one lump sum fee to provide full compensation for reimbursement of utility relocation as the result of construction activities as needed to meet the Contract requirements.
  - b. This lump sum amount shall be reimbursement for utility relocation located inside the defined easement as identified on the Plans. Reimbursement based

on a fixed in kind lump sum based on written documentation provided by utilities not to exceed \$50,000.00.

36. Reimbursement for Crop Damage:

- a. Measurement and payment for reimbursement of crop damage shall be based on one lump sum to provide full compensation for reimbursement of crops damaged as the result of construction activities as needed to meet the Contract requirements.
- b. This lump sum amount shall be reimbursement for crop damage located inside the defined easement as identified on the Plans. Reimbursement based on a fixed in kind lump sum based on written documentation provided by land owner not to exceed \$10,000.00.

PART 4 - EXECUTION

4.1 PAY ITEMS

- A. The pay items listed hereinbefore refer to the items listed in the Bid Schedule and cover all the pay items under the base bid for the contract.
- B. Any and all other items of work listed in the specifications or shown on the Contract Drawings for the contract shall be considered incidental to and included in those pay items.

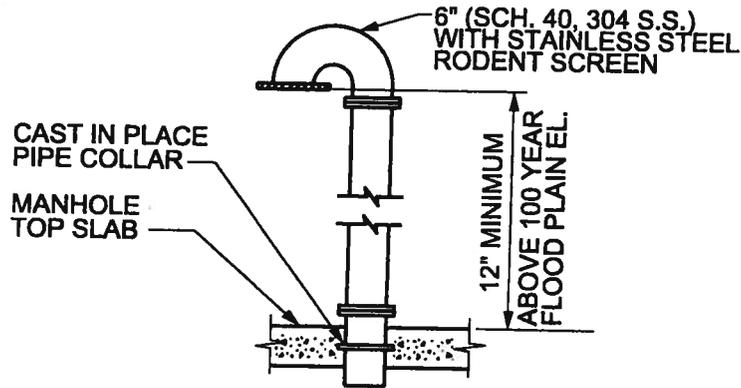
4.2 QUANTITIES OF ESTIMATE

- A. Wherever the estimated quantities of work to be done and materials to be furnished under this contract are shown in any of the documents, including the Bid Proposal, they are given for use in comparing bids and the right is especially reserved except as herein otherwise specifically limited, 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 or liability for damages. The Owner will not be financially responsible for any omissions from the Contract Documents and therefore not included by the Contractor in his proposal.
- B. The mapping utilized for the Drawings in the Contract Documents are indicated at an approximate scale and shall not be scaled for quantity take-offs. The pipeline quantities listed in the bid schedule are given for use in comparing bids and may not be the actual quantities to be installed. It is the Contractor's responsibility to field verify the length and quantities of pipeline to be installed prior to the ordering of materials. Payment on unit price contracts are based on actual quantities installed. The Owner will not be financially responsible for any shortage of pipe or overrun of pipe ordered for the pipeline quantities.
- C. The actual quantities of all materials to be used for this project shall be field verified prior to the Contractor ordering the necessary materials. The quantity listed in the bid schedule is given for use in comparing bids and may increase or diminish as may be deemed necessary or as directed by the Owner. Any such increase or diminution shall not give cause for

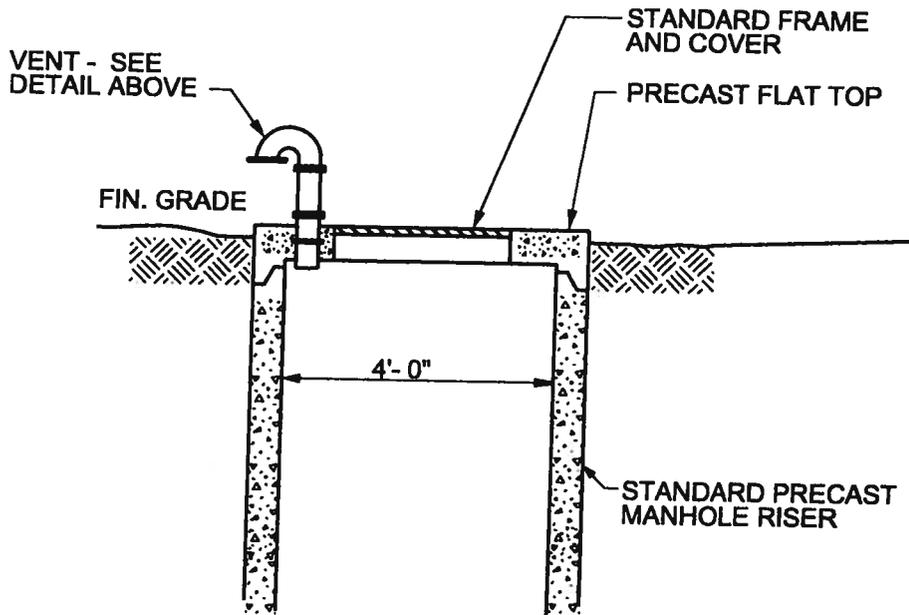
claims or liability for damages. The Owner will not be financially responsible for any charges incurred for restocking of materials ordered.

END OF SECTION 01 11 00

- C. All ductile iron fittings shall be pressure rated 350 and shall be ductile cast iron grade per ASTM A536 with same interior and exterior coatings as the pipe.
- D. Mechanical joints shall be used where specifically called for on the Drawings. Mechanical joint restraints for ductile iron pipe are to be furnished according to ANSI/AWWA C111/A21.11. All pipe joints must be furnished complete with all accessories. Ductile iron mechanical restrained joints shall be Megalug Series 1100, or approved equal. Rubber gaskets shall be made of plain first grade rubber, free of imperfections and porosity. Hardness shall be 70 to 75 durometer.
- E. Flanged Pipe and Fittings:
1. Ductile iron flanges for pipe and fittings are to have dimensions, facing, and drilling to correspond with ANSI B16.1 125 pound template with pressure rating 250.
  2. Where flanges are pit cast integrally with pipe in vertical position in dry sand molds, flanged pipe shall be latest revision of ANSI Specifications A21.2 for Class 150 or Class 250 pipe. Where flanged pipe is made up by threading plain end, centrifugally cast pipe, screwing on specially designed long hub flanges, and refacing across both face of flange and end of pipe, flange shall be per ANSI Specification B16.1 and pipe shall be ANSI Specification A21.6 Class 125. Either method of manufacture of flanged pipe will be acceptable; except when plain ends fit into mechanical joint bells, then centrifugally cast pipe shall be used.
  3. With prior approval of the Owner or Owner's Representative, the Contractor may use mechanical grooved or shouldered pipe couplings, flanges, and fittings, as manufactured by Victaulic Company of America or approved equal, conforming to ANSI/AWWA C606-97 on ductile iron piping systems in lieu of flanged joints. Grooved product manufacturer is to be certified ISO-9001 single supplier. The Contractor shall install the grooved system by means of reference to the manufacturer's most recent published instruction and ensure that the complete installation is similar in function to a flanged piping system.
  4. With prior approval of the Owner or Owner's Representative, couplings and flanges for use with grooved and shouldered joints shall be ductile iron or malleable iron conforming to ASTM A-536 or A-47. Fittings shall be ductile, ASTM A-536, or cast iron, ASTM A-48. Fittings conforming to center to end dimensions, wall thickness, and rigid grooving dimensions for end pipe preparation as specified in AWWA C-110, AWWA C-153, and AWWA C-606 shall be required. Gaskets shall be the center leg design to conform to ductile pipe surfaces, have properties designated in ASTM A-2000, and shall be suitable for the required service. Bolts shall be heat treated, track head design, plated, and manufactured in accordance with ASTM A-183, minimum tensile 110,000 PSI or Type 304 stainless steel to ASTM A-193, Grade B-8 Class 2.
- F. Restrained Joints, Reaction Anchorage and Blocking:
1. Restrained joint pipe shall be furnished and installed in accordance with these specifications and the manufacturer's recommendations, in the locations shown on the Drawings. Restrained joints shall prevent "pulling apart" of push-on joints due to axial thrust forces. Joints shall restrain against working pressures at least equal to the working pressure rating of the pipe. Restrained joint fittings shall be equal to manufacturer's specifications for "TR FLEX", "Flex-Ring", "Lok-Ring", Megalug, or other approved equal.



**VENT DETAIL FOR AIR RELIEF**  
NOT TO SCALE



**FLAT TOP MANHOLE VENT DETAIL**  
NOT TO SCALE

|                                                          |       |
|----------------------------------------------------------|-------|
| CITY OF HUNTSVILLE                                       |       |
| FLAT TOP MANHOLE VENT                                    |       |
| CITY ENGINEERING DIVISION<br>CITY OF HUNTSVILLE, ALABAMA | SD-23 |

REVISED APRIL 2011



# HUNTSVILLE

Urban Development Department  
Engineering Division

Kathy Martin, P.E.  
Director  
City Engineer

**WPC SANITARY SEWER RELOCATION-COUNTY LINE ROAD & I565**  
**Project No. 65-12-SM01 & ALDOT Project No. IM-I565(307)**  
**January 29, 2014**

## **Addendum #3**

**Due to hazardous traveling conditions across the State of Alabama, the Bid Opening has been postponed to Tuesday, February 4, 2014 at 10:00 a.m. in the 1<sup>st</sup> Floor Conference Room, 320 Fountain Circle, Huntsville, Alabama**

**END OF ADDENDUM #3**

The Star of Alabama

**CERTIFICATION OF COMPLIANCE WITH TITLE 39, CODE OF ALABAMA**

In accordance with Code of Alabama (1975) §39-5-1(b), I hereby certify that the contract with Reed Contracting Services, Inc., in the amount of NINE HUNDRED SEVENTY-EIGHT THOUSAND NINETY-THREE AND 32/100 DOLLARS (\$978,093.32), for WPC Sanitary Sewer Relocation-County Line Road and I-565, which is being submitted to the City Council of the City of Huntsville for approval on this the 13th day of February, 2014, has been let in accordance with Code of Alabama, Title 39 and all other applicable provisions.

  
\_\_\_\_\_  
Shane Cook  
Director of Water Pollution Control  
City of Huntsville

**E-VERIFY – NOTICE**

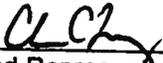
The Beason-Hammon Alabama Taxpayer and Citizen Protection Act, Act No. 2011-535, Code of Alabama (1975) § 31-13-1 through 31-13-30 (also known as and hereinafter referred to as “ the Alabama Immigration Act”) as amended by Act No. 2012-491 on May 16, 2012 is applicable to all competitively bid contracts with the City of Huntsville. As a condition for the award of a contract and as a term and condition of the contract with the City of Huntsville, in accordance with § 31-13-9 (a) of the Alabama Immigration Act, as amended, any business entity or employer that employs one or more employees shall not knowingly employ, hire for employment, or continue to employ an unauthorized alien within the State of Alabama.

During the performance of the contract, such business entity or employer shall participate in the E-Verify program and shall verify every employee that is required to be verified according to the applicable federal rules and regulations. The business entity or employer shall assure that these requirements are included in each subcontract in accordance with §31-13-9(c). Failure to comply with these requirements may result in breach of contract, termination of the contract or subcontract, and possibly suspension or revocation of business licenses and permits in accordance with §31-13-9 (e) (1) & (2).

Code of Alabama (1975) § 31-13-9 (k) requires that the following clause be included in all City of Huntsville contracts that have been competitively bid and is hereby made a part of this contract:

“By signing this contract the contracting parties affirm, for the duration of the agreement, that they will not violate federal immigration law or knowingly employ, hire for employment, or continue to employ an unauthorized alien within the State of Alabama. Furthermore, a contracting party found to be in violation of this provision shall be deemed in breach of the agreement and shall be responsible for all damages resulting therefrom.”

\_\_\_\_\_  
Reed Contracting Services, Inc.  
(Company)

BY:   
\_\_\_\_\_  
(Authorized Representative)