



**CALL NO. 304**

**CONTRACT ID. 171230**

**HARRISON COUNTY**

**FED/STATE PROJECT NUMBER FD04 SPP 049 0032 010-011**

**DESCRIPTION KY 32**

**WORK TYPE GRADE & DRAIN WITH ASPHALT SURFACE**

**PRIMARY COMPLETION DATE 80 WORKING DAYS**

**LETTING DATE: July 28,2017**

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 AM EASTERN DAYLIGHT TIME July 28,2017. Bids will be publicly announced at 10:00 AM EASTERN DAYLIGHT TIME.

**PLANS AVAILABLE FOR THIS PROJECT.**

**REQUIRED BID PROPOSAL GUARANTY:** Not less than 5% of the total bid.

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**PART I**  
**SCOPE OF WORK**

## ADMINISTRATIVE DISTRICT - 06

**CONTRACT ID - 171230**

**FD04 SPP 049 0032 010-011**

**COUNTY - HARRISON**

**PCN - DE04900321730**

**FD04 SPP 049 0032 010-011**

KY 32 (MP 10.074) IMPROVE SAFETY ON KY 32 AT THE ENTRANCE TO HARRISON MEMORIAL HOSPITAL IN CYNTHIANA. (MP 10.274), A DISTANCE OF 0.20 MILES.GRADE & DRAIN WITH ASPHALT SURFACE SYP NO. 06-00908.00.

GEOGRAPHIC COORDINATES LATITUDE 38:23:05.00 LONGITUDE 84:16:36.00

**COMPLETION DATE(S):**

80 WORKING Days

APPLIES TO ENTIRE CONTRACT

## **CONTRACT NOTES**

### **PROPOSAL ADDENDA**

All addenda to this proposal must be applied when calculating bid and certified in the bid packet submitted to the Kentucky Department of Highways. Failure to use the correct and most recent addenda may result in the bid being rejected.

### **BID SUBMITTAL**

Bidder must use the Department's Expedite Bidding Program available on the Internet web site of the Department of Highways, Division of Construction Procurement. ([www.transportation.ky.gov/construction-procurement](http://www.transportation.ky.gov/construction-procurement))

The Bidder must download the bid file located on the Bid Express website ([www.bidx.com](http://www.bidx.com)) to prepare a bid packet for submission to the Department. The bidder must submit electronically using Bid Express.

### **JOINT VENTURE BIDDING**

Joint venture bidding is permissible. All companies in the joint venture must be prequalified in one of the work types in the Qualifications for Bidders for the project. The bidders must get a vendor ID for the joint venture from the Division of Construction Procurement and register the joint venture as a bidder on the project. Also, the joint venture must obtain a digital ID from Bid Express to submit a bid. A joint bid bond of 5% may be submitted for both companies or each company may submit a separate bond of 5%.

### **UNDERGROUND FACILITY DAMAGE PROTECTION**

The contractor shall make every effort to protect underground facilities from damage as prescribed in the Underground Facility Damage Protection Act of 1994, Kentucky Revised Statute KRS 367.4901 to 367.4917. It is the contractor's responsibility to determine and take steps necessary to be in compliance with federal and state damage prevention directives. When prescribed in said directives, the contractor shall submit Excavation Locate Requests to the Kentucky Contact Center (KY811) via web ticket entry. The submission of this request does not relieve the contractor from the responsibility of contacting non-member facility owners, whom shall be contacted through their individual Protection Notification Center. Non-compliance with these directives can result in the enforcement of penalties.

### **SPECIAL NOTE FOR COMPOSITE OFFSET BLOCKS**

Contrary to the Standard Drawings (2016 edition) the Cabinet will allow 6" composite offset blocks in lieu of wooden offset blocks, except as specified on proprietary end treatments and crash cushions. The composite blocks shall be selected from the Cabinet's List of Approved Materials.

### **REGISTRATION WITH THE SECRETARY OF STATE BY A FOREIGN ENTITY**

Pursuant to KRS 176.085(1)(b), an agency, department, office, or political subdivision of the Commonwealth of Kentucky shall not award a state contract to a person that is a foreign entity required by [KRS 14A.9-010](#) to obtain a certificate of authority to transact business in the Commonwealth (“certificate”) from the Secretary of State under [KRS 14A.9-030](#) unless the person produces the certificate within fourteen (14) days of the bid or proposal opening. If the foreign entity is not required to obtain a certificate as provided in [KRS 14A.9-010](#), the foreign entity should identify the applicable exception. Foreign entity is defined within [KRS 14A.1-070](#).

**For all foreign entities required to obtain a certificate of authority to transact business in the Commonwealth, if a copy of the certificate is not received by the contracting agency within the time frame identified above, the foreign entity’s solicitation response shall be deemed non-responsive or the awarded contract shall be cancelled.**

Businesses can register with the Secretary of State at <https://secure.kentucky.gov/sos/ftbr/welcome.aspx>.

### **SPECIAL NOTE FOR PROJECT QUESTIONS DURING ADVERTISEMENT**

Questions about projects during the advertisement should be submitted in writing to the Division of Construction Procurement. This may be done by fax (502) 564-7299 or email to [kytc.projectquestions@ky.gov](mailto:kytc.projectquestions@ky.gov). The Department will attempt to answer all submitted questions. The Department reserves the right not to answer if the question is not pertinent or does not aid in clarifying the project intent.

The deadline for posting answers will be 3:00 pm Eastern Daylight Time, the day preceding the Letting. Questions may be submitted until this deadline with the understanding that the later a question is submitted, the less likely an answer will be able to be provided.

The questions and answers will be posted for each Letting under the heading “Questions & Answers” on the Construction Procurement website ([www.transportation.ky.gov/contract](http://www.transportation.ky.gov/contract)). The answers provided shall be considered part of this Special Note and, in case of a discrepancy, will govern over all other bidding documents.

### **HARDWOOD REMOVAL RESTRICTIONS**

The US Department of Agriculture has imposed a quarantine in Kentucky and several surrounding states, to prevent the spread of an invasive insect, the emerald ash borer. Hardwood cut in conjunction with the project may not be removed from the state. Chipping or burning on site is the preferred method of disposal.

### **INSTRUCTIONS FOR EXCESS MATERIAL SITES AND BORROW SITES**

Identification of excess material sites and borrow sites shall be the responsibility of the Contractor. The Contractor shall be responsible for compliance with all applicable state and federal laws and may wish to consult with the US Fish and Wildlife Service to seek protection under Section 10 of the Endangered Species Act for these activities.

### **ACCESS TO RECORDS**

The contractor, as defined in KRS 45A.030 (9) agrees that the contracting agency, the Finance and Administration Cabinet, the Auditor of Public Accounts, and the Legislative Research Commission, or their duly authorized representatives, shall have access to any books, documents, papers, records, or other evidence, which are directly pertinent to this contract for the purpose of financial audit or program review. Records and other prequalification information confidentially disclosed as part of the bid process shall not be deemed as directly pertinent to the contract and shall be exempt from disclosure as provided in KRS 61.878(1)(c). The contractor also recognizes that any books, documents, papers, records, or other evidence, received during a financial audit or program review shall be subject to the Kentucky Open Records Act, KRS 61.870 to 61.884.

In the event of a dispute between the contractor and the contracting agency, Attorney General, or the Auditor of Public Accounts over documents that are eligible for production and review, the Finance and Administration Cabinet shall review the dispute and issue a determination, in accordance with Secretary's Order 11-004.

06/01/16

**SPECIAL NOTE FOR RECIPROCAL PREFERENCE**

**Reciprocal preference to be given by public agencies to resident bidders**

**By reference, KRS 45A.490 to 45A.494 are incorporated herein and in compliance regarding the bidders residency. Bidders who want to claim resident bidder status should complete the Affidavit for Claiming Resident Bidder Status along with their bid in the Expedite Bidding Program. Submittal of the Affidavit should be done along with the bid in Bid Express.**

03/01/2011



### **ASPHALT MIXTURE**

Unless otherwise noted, the Department estimates the rate of application for all asphalt mixtures to be 110 lbs/sy per inch of depth.

### **DGA BASE**

Unless otherwise noted, the Department estimates the rate of application for DGA Base to be 115 lbs/sy per inch of depth.

### **DGA BASE FOR SHOULDERS**

Unless otherwise noted, the Department estimates the rate of application for DGA Base for Shoulders to be 115 lbs/sy per inch of depth. The Department will not measure necessary grading and/or shaping of existing shoulders prior to placing of DGA Base, but shall be incidental to the Contract unit price per ton for DGA Base.

Accept payment at the Contract unit price per ton as full compensation for all labor, materials, equipment, and incidentals for grading and/or shaping of existing shoulders and furnishing, placing, and compacting the DGA Base.

### **INCIDENTAL SURFACING**

The Department has included in the quantities of asphalt mixtures established in the proposal estimated quantities required for resurfacing or surfacing mailbox turnouts, farm field entrances, residential and commercial entrances, curve widening, ramp gores and tapers, and road and street approaches, as applicable. Pave these areas to the limits as shown on Standard Drawing RPM-110-06 or as directed by the Engineer. In the event signal detectors are present in the intersecting streets or roads, pave the crossroads to the right of way limit or back of the signal detector, whichever is the farthest back of the mainline. Surface or resurface these areas as directed by the Engineer. The Department will not measure placing and compacting for separate payment but shall be incidental to the Contract unit price for the asphalt mixtures.

### **FUEL AND ASPHALT PAY ADJUSTMENT**

The Department has included the Contract items Asphalt Adjustment and Fuel Adjustment for possible future payments at an established Contract unit price of \$1.00. The Department will calculate actual adjustment quantities after work is completed. If existing Contract amount is insufficient to pay all items on the contract with the adjustments, the Department will establish additional monies with a change order.

### **OPTION B**

Be advised that the Department will control and accept compaction of asphalt mixtures furnished on this project under OPTION B in accordance with Sections 402 and 403.

**RECOMMENDATION FOR PICKUP OF ITEMS TO BE INSTALLED  
 ON TRAFFIC SIGNALS/LIGHTING**

Item Number: 6-608  
 County: Harrison  
 Description: Warning Beacons KY 32 & Confederate Dr. Cynthiana

Cabinets	Master code	
1	T-01-0000	Aluminum Cabinet (Beacon)

Signals		
8	T-02-0080	12 inch red/yellowbeacon
4	T-02-0330	LED Module 12" red ball
4	T-02-0340	LED Module 12" yellow ball

Poles		
4	T-04-0010	Steel Strain Pole 28 foot
4	T-04-0010	Steel Strain Pole 28 foot

Electrical Contractor Name \_\_\_\_\_  
 Electrical Contractor Supervisor \_\_\_\_\_ Contact number for Supervisor \_\_\_\_\_  
 Project Engineer \_\_\_\_\_ Contact number for Project Engineer \_\_\_\_\_  
 Project Engineer attests that the mentioned contractor is the actual electrical contractor on this project  
 Signature of Project Engineer or Designee \_\_\_\_\_

80 working days will be required for this project.

Phase III of the Maintenance of Traffic Plan has a 14 calendar day duration. For any day over 14 that Phase III traffic configuration is in place the contractor will be charged liquidated damages at the rate specified in the Standard Specifications.

KENTUCKY TRANSPORTATION CABINET  
DEPARTMENT OF HIGHWAYS  
TRAFFIC MANAGEMENT PLAN

County: Harrison Item No.: 6-908.00

Federal Project No.: \_\_\_\_\_

Project Description:  
Improve Safety on KY 32 at the entrance to Harrison Memorial Hospital in Cynthiana

Roadway Classification:  Urban  Rural  
 Local  Collector  Arterial  Interstate

ADT (Current) 6,980 AM Peak Current \_\_\_\_\_ PM Peak Current \_\_\_\_\_

Project Designation:  Significant  Other: \_\_\_\_\_

Traffic Control Plan Design:

Taper and Diversion Design Speeds 25 mph

Minimum Lane Width 10 ft.

Minimum Shoulder Width NA

Minimum Bridge Width NA

Minimum Radius 375 ft.

Maximum Grade 5.57%

Minimum Taper Length 150 ft.

Minimum Intersection LOS F

Existing Traffic Queue Lengths NA

Projected Traffic Queue Lengths NA

Comments:  
Access to the Hospital must be maintained at all times.

**KENTUCKY TRANSPORTATION CABINET  
DEPARTMENT OF HIGHWAYS  
TRAFFIC MANAGEMENT PLAN  
HARRISON COUNTY, ITEM 6-908.00  
KY 32 HOSPITAL ENTRANCE**

**Public Information Plan (PIP) and Temporary Traffic Control Plan (TTCP)**

The following PIP and TTCP will cite the word "Referenced". This infers to this document as well as all bidding documents associated to the respective project, including but not limited to the Construction Plan Set, Capture all Promises – "CAP", KYTC Specifications, KYTC Standard Drawings, KYTC Sepia Drawings, KYTC Policy and Procedures for Safety and Mobility through Work Zones, Manual on Uniform Traffic Control Devices, FHWA's Guidance for Developing and Implementing Traffic Management Plans. (All being of Current Edition)

**1) Public Information Plan**

- |  |  |
|--|--|
| a) Prepared by   | <input checked="" type="checkbox"/> KYTC or <input type="checkbox"/> _____                                     |
| b) Identify Trip Generators                                  | Referenced, Trip Generators include local residential and business traffic, school buses, emergency responders |
| c) Identify Types of Road Users                              | Referenced, Cars, Trucks, School Buses   |
| d) Public Information Message                                | Referenced, See Below  |
| e) Public Information Strategies to be used                  | Referenced, See Below  |
| f) Railroad Involvement                                      | Referenced, See Below  |
| g) Address Pedestrians, Bikes & Mass Transit                 | Referenced, See TTCP   |
| h) Address Timing, Frequency, Updates, Effectiveness of Plan | Referenced, See TTCP   |

The primary goal of the Public Information Plan (PIP) is to inform the motoring public and area stakeholders of project information including Temporary Traffic Control Plan (TTCP). The KYTC District Six Public Information Officer (PIO) will coordinate and disseminate to stakeholders and the media appropriate information regarding construction plans.

**Local Stakeholders**

- Officials
  - State Senator Walter Blevins
  - State Representative Tom McKee
  - County Judge Executive Alex Barnett
  - Cynthiana Mayor James Smith
- Local Agencies
  - Harrison County Public Schools
  - Harrison County Police and Fire

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HARRISON COUNTY, ITEM 6-908.00  
KY 32 HOSPITAL ENTRANCE**

- **Utility Companies**
  - Local utility companies are kept apprised of all new projects by District 6 and are invited to all pre-construction meetings

**Trucking Firms and Out of State Stakeholders**

Information will be distributed electronically to trucking firms via Director ? at the Department of Vehicle Registration (502-564-4540, *provide email*)? . Information will also be posted on the 511 website ([www.511.ky.gov](http://www.511.ky.gov)) and on the 511 telephone information system.

**Presentation**

A project description including anticipated schedule will be provided to the media, stakeholders and other emergency service agencies via e-mail prior to construction. Information will be provided to these groups via traffic advisories, press releases, and the District 6 website.

**Media Strategies**

The following media will be contacted at the beginning of the construction project at key construction transitions points during construction and at the end of construction:

Points of Media Contact

- Newspapers: *Cynthiana Democrat*
- Radio: Cincinnati Market
- Television / Cable: Cincinnati Market

Milestones to Contact Media

Media shall be contacted immediately prior to construction and updated throughout construction, and at significant transitions of construction phases.

Public Information Message

Notifications of the closures and detours will be provided a minimum of one week advance notice. Appropriate time notification will be provided to the *Cincinnati Enquire* with respect to their days of publication. Further, variable message boards will be used throughout the community for notice.

KENTUCKY TRANSPORTATION CABINET  
DEPARTMENT OF HIGHWAYS  
TRAFFIC MANAGEMENT PLAN  
HARRISON COUNTY, ITEM 6-908.00  
KY 32 HOSPITAL ENTRANCE

**2) Temporary Traffic Control Plan (TTCP)**

**Phase 1**

Description of Phase Activities

1. Pavement mill and texture from station 10+44 to station 12+80
2. Construct Country Club Entrance Diversion
3. Construct Temporary Hospital Entrance Diversion

Lane Use on Maintained Roads

Two-way, One-Lane traffic on KY 32. As diversions are constructed existing entrances can be removed

Key Access Points

- Country Club
- Hospital

a) Is Road Closure Allowed?	No
b) Detour Conditions	No
c) Working Hour Restrictions	No
d) Holiday or Special Event Work Restrictions	No
e) <del>Evaluation of Intersection LOS</del>	N/A – Deleted thru remainder of Phases
f) <del>Evaluation of Queue Lengths</del>	N/A – Deleted thru remainder of Phases
g) Evaluation of User Costs & Incentives / Disincentives	No
h) Method of Project Bidding	Construction
i) Address Drop-Off Protection Criteria	Referenced
j) Temporary Barrier Requirements	Referenced
k) Evaluation of Existing Guardrail Conditions	Referenced;
	N/A.
l) Address Temporary Drainage	Referenced; Contractor to follow BMPs
m) Special Notes	N/A
n) Address Pedestrians, Bikes & Mass Transit	There is currently no Pedestrian or dedicated bike facilities on KY 32

**Phase 2**

Description of Phase Activities

1. Construct north 22 foot of new KY 32
2. Construct Confederate Drive
3. Construct residential entrances

**KENTUCKY TRANSPORTATION CABINET  
DEPARTMENT OF HIGHWAYS  
TRAFFIC MANAGEMENT PLAN  
HARRISON COUNTY, ITEM 6-908.00  
KY 32 HOSPITAL ENTRANCE**

- 4. Construct Country Club Entrance
- 5. Construct Country Estate Entrance
- 6. Construct Temporary Hospital Access Connector

**Lane Use on Maintained Roads**

Shift all KY 32 thru traffic to new construction  
Close existing KY 32 at stations 13+20 and 33+00  
Existing KY 32 west of Hospital Entrance to be used for Hospital Traffic Only

**Key Access Points to Maintain**

Hospital  
Country Club

- |  |                                       |
|--|---------------------------------------|
| a) Is Road Closure Allowed?                              | No                                    |
| b) Detour Conditions                                     | No                                    |
| c) Working Hour Restrictions                             | No                                    |
| d) Holiday or Special Event Work Restrictions            | No                                    |
| g) Evaluation of User Costs & Incentives / Disincentives | Referenced                            |
| h) Method of Project Bidding                             | Referenced                            |
| i) Address Drop-Off Protection Criteria                  | Referenced                            |
| j) Temporary Barrier Requirements                        | Referenced                            |
| k) Evaluation of Existing Guardrail Conditions           | Referenced                            |
| l) Address Temporary Drainage                            | Referenced; Contractor to follow BMPs |
| m) Special Notes   | Referenced in Plan Set.               |
| n) Address Pedestrians, Bikes & Mass Transit             | Referenced;                           |

**Phase 3**

**Description of Phase Activities**

- 1. Construct new Hospital Entrance

**Lane Use on Maintained Roads**

Traffic on north side of KY 32

**Key Access Points to Maintain**

Hospital  
Country Club

- |                              |    |
|------------------------------|----|
| a) Is Road Closure Allowed?  | No |
| b) Detour Conditions         | No |
| c) Working Hour Restrictions | No |



**KENTUCKY TRANSPORTATION CABINET  
DEPARTMENT OF HIGHWAYS  
TRAFFIC MANAGEMENT PLAN  
HARRISON COUNTY, ITEM 6-908.00  
KY 32 HOSPITAL ENTRANCE**

- |  |   |
|--|---|
| d) Holiday or Special Event Work Restrictions            | No  |
| g) Evaluation of User Costs & Incentives / Disincentives | This Phase of Work has a time limit of 14 calendar days. For any day over 14 Phase III is in effect the contractor will be charged liquidated damages at the rate specified in the Standard Specifications. |
| h) Method of Project Bidding                             | Referenced  |
| i) Address Drop-Off Protection Criteria                  | Referenced  |
| j) Temporary Barrier Requirements                        | Referenced  |
| k) Evaluation of Existing Guardrail Conditions           | Referenced  |
| l) Address Temporary Drainage                            | Referenced; Contractor to follow BMPs   |
| m) Special Notes   | Referenced in Plan Set.   |
| n) Address Pedestrians, Bikes & Mass Transit             | Referenced;   |

**Phase 4**

Description of Phase Activities

1. Construct south side of KY 32
2. Construct Cemetery Entrance
3. Construct Residential Entrances
4. Place final surface over entire roadway
5. Place final traffic items

Lane Use on Maintained Roads

Traffic on north side of KY 32

Key Access Points to Maintain

- Hospital
- Country Club


- |  |                                       |
|--|---------------------------------------|
| a) Is Road Closure Allowed?                              | No.                                   |
| b) Detour Conditions                                     | No                                    |
| c) Working Hour Restrictions                             | No                                    |
| d) Holiday or Special Event Work Restrictions            | No                                    |
| g) Evaluation of User Costs & Incentives / Disincentives | Referenced                            |
| h) Method of Project Bidding                             | Referenced                            |
| i) Address Drop-Off Protection Criteria                  | Referenced                            |
| j) Temporary Barrier Requirements                        | Referenced                            |
| k) Evaluation of Existing Guardrail Conditions           | Referenced                            |
| l) Address Temporary Drainage                            | Referenced; Contractor to follow BMPs |
| m) Special Notes   | Referenced in Plan Set.               |


KENTUCKY TRANSPORTATION CABINET  
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TRAFFIC MANAGEMENT PLAN  
HARRISON COUNTY, ITEM 6-908.00  
KY 32 HOSPITAL ENTRANCE

n) Address Pedestrians, Bikes & Mass Transit Referenced;

**APPROVAL:**


  
Project Manager 3-29-16  
Date

  
TEBM for Project Delivery (Construction) 3/29/16  
Date

  
TEBM for Engineering Support Services (Traffic) 3/30/16  
Date

\_\_\_\_\_  
FHWA Representative Date

Revisions to the TMP require review/approval by the signatories.

	KENTUCKY TRANSPORTATION CABINET Department of Highways DIVISION OF RIGHT OF WAY & UTILITIES	TC 62-226 Rev. 01/2016 Page 1 of 1
<b>RIGHT OF WAY CERTIFICATION</b>		

<input checked="" type="checkbox"/> Original	<input type="checkbox"/> Re-Certification	<b>RIGHT OF WAY CERTIFICATION</b>	
ITEM #	COUNTY	PROJECT # (STATE)	PROJECT # (FEDERAL)
06-908.00	Harrison	FD04 049 1100 8666201	N/A

**PROJECT DESCRIPTION**

IMPROVE SAFETY ON KY-32 AT THE ENTRANCE TO HARRISON MEMORIAL HOSPITAL IN CYNTHIANA.(12CCR)

No Additional Right of Way Required

Construction will be within the limits of the existing right of way. The right of way was acquired in accordance to FHWA regulations under the Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970, as amended. No additional right of way or relocation assistance were required for this project.

Condition # 1 (Additional Right of Way Required and Cleared)

All necessary right of way, including control of access rights when applicable, have been acquired including legal and physical possession. Trial or appeal of cases may be pending in court but legal possession has been obtained. There may be some improvements remaining on the right-of-way, but all occupants have vacated the lands and improvements, and KYTC has physical possession and the rights to remove, salvage, or demolish all improvements and enter on all land. Just Compensation has been paid or deposited with the court. All relocations have been relocated to decent, safe, and sanitary housing or that KYTC has made available to displaced persons adequate replacement housing in accordance with the provisions of the current FHWA directive.

Condition # 2 (Additional Right of Way Required with Exception)

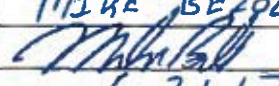
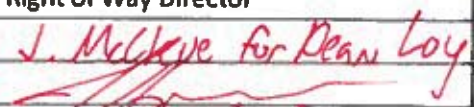
The right of way has not been fully acquired, the right to occupy and to use all rights-of-way required for the proper execution of the project has been acquired. Some parcels may be pending in court and on other parcels full legal possession has not been obtained, but right of entry has been obtained, the occupants of all lands and improvements have vacated, and KYTC has physical possession and right to remove, salvage, or demolish all improvements. Just Compensation has been paid or deposited with the court for most parcels. Just Compensation for all pending parcels will be paid or deposited with the court prior to AWARD of construction contract

Condition # 3 (Additional Right of Way Required with Exception)

The acquisition or right of occupancy and use of a few remaining parcels are not complete and/or some parcels still have occupants. All remaining occupants have had replacement housing made available to them in accordance with 49 CFR 24.204. KYTC is hereby requesting authorization to advertise this project for bids and to proceed with bid letting even though the necessary right of way will not be fully acquired, and/or some occupants will not be relocated, and/or the just compensation will not be paid or deposited with the court for some parcels until after bid letting. KYTC will fully meet all the requirements outlined in 23 CFR 635.309(c)(3) and 49 CFR 24.102(j) and will expedite completion of all acquisitions, relocations, and full payments after bid letting and prior to AWARD of the construction contract or force account construction.

Total Number of Parcels on Project	EXCEPTION (S) Parcel #	ANTICIPATED DATE OF POSSESSION WITH EXPLANATION
Number of Parcels That Have Been Acquired		
Signed Deed		
Condemnation		
Signed ROE		

Notes/ Comments (Use Additional Sheet if necessary)

<b>LPA RW Project Manager</b>		<b>Right of Way Supervisor</b>	
Printed Name		Printed Name	MIKE BEZOLD
Signature		Signature	
Date		Date	6-21-17
<b>Right of Way Director</b>		<b>FHWA</b>	
Printed Name	J. McCreary for Dean Loy	Printed Name	
Signature		Signature	
Date	6/22/17	Date	

## UTILITIES AND RAIL CERTIFICATION NOTE

**HARRISON COUNTY  
FD04 049 86662 01U  
SAFETY IMPROVEMENTS ON KY-32 AT THE ENTRANCE TO  
HARRISON MEMORIAL HOSPITAL IN CYNTHIANA  
ITEM 6-908.00**

### GENERAL PROJECT NOTE ON UTILITY PROTECTION

Utility coordination efforts determined that there is significant utility relocation work required to complete the project. Any work pertaining to these utility facilities is defined in the bid package and is to be carried out as instructed by the Kentucky Transportation Cabinet. The contractor will be responsible for any coordination or adjustments that are discussed or quantified in the proposal.

#### Flowable Fill Requirement

The road contractor MUST use flowable fill as the backfill media any place utility facilities cross under existing or proposed roadway surfaces unless concrete encasement is called for per plan. Compacted earth or flowable fill shall be used in all other ditches within the project limits. It should also be noted that the cost of the flowable fill shall be incidental to the cost of the utility being installed.

#### Maintenance of Utility Services

All existing utility facilities are to be maintained throughout road construction. Temporary utility services to maintain service are to be provided and paid for by the road contractor as incidental to road construction. No additional compensation will be paid the contractor for temporary work and materials to maintain existing utility services. No unauthorized discharge of sewage due to the road contractor's work will be allowed.

#### Damage to Utilities

Any intentional or accidental disruption of service due to damage to any utility service mains caused by any of the contractor's operations without three days advance notice to the utility owner shall be cause for the Cabinet to charge liquidated damages in the amount of five thousand dollars per day (\$5000/day) per occurrence against the contractor until such time as the utility main is restored.

Any intentional or accidental disruption of any individual utility service caused by any of the contractor's operations without three days advance notice to the utility owner shall be cause for the Cabinet to charge liquidated damages in the amount of five hundred dollars per day (\$500/day) per occurrence against the contractor until such time as the utility main is restored.

In the case of a main disruption, liquidated damages shall be charged at the main disruption rate only. Liquidated damages shall not be charged in addition for service disruptions when a main disruption is involved.

#### Abandoned Utilities

The contractor shall safeload the entire length of all abandoned pipes 6 inches in diameter and larger under proposed pavement and under any existing pavement that is to remain. The contractor shall safeload the entire length of all abandoned pipes 15 inches and larger which will be located outside of the proposed pavement but within project limits. Appropriate bid items have been included in the road

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contract. The safeloading criteria shall be observed unless otherwise directed by the Resident Engineer or his representative.

### External Utility Permits

The Kentucky Division of Water permit for water relocation has been improved and is to be included in the proposal.

### Utility Phasing

The contractor should be aware that some phases of the road construction will need to be completed first to accommodate the relocation of utilities and that some utilities need to be relocated first to accommodate the relocation of others. The contractor should review the plans and draw his own conclusions as to the phasing of the road work and of various utilities. The contractor should pay close attention to the proximity of construction of new facilities when working in the vicinity of existing water mains and sanitary sewers to prevent blow-outs.

### **NOTE: DO NOT DISTURB THE FOLLOWING UTILITIES LOCATED WITHIN THE PROJECT DISTURB LIMITS**

City of Cynthiana Water & Sewer, Kentucky Utilities, Bluegrass Energy, AT&T Kentucky, Charter Communications, and Columbia Gas of Kentucky all have facilities within the project area. Please see the notes below pertaining to their relocation work.

**\*The Contractor is fully responsible for protection of all utilities listed above\***

### **THE FOLLOWING COMPANIES ARE RELOCATING/ADJUSTING THEIR UTILITIES WITHIN THE PROJECT LIMITS AND WILL BE COMPLETE PRIOR TO CONSTRUCTION**

Kentucky Utilities and Columbia Gas of Kentucky have underground and overhead facilities to relocate. Kentucky Utilities completed their relocation work in July 2016. Columbia Gas of Kentucky will complete their relocation work before the letting.

### **THE FOLLOWING COMPANIES HAVE FACILITIES TO BE RELOCATED/ADJUSTED BY THE COMPANY OR THE COMPANY'S SUBCONTRACTOR AND IS TO BE COORDINATED WITH THE ROAD CONTRACT**

Bluegrass Energy, AT&T Kentucky, and Charter Communications have overhead and underground facilities to relocate. Relocation of these facilities has already begun. The contractor will be required to coordinate roadway construction with the ongoing utility relocations. AT&T Kentucky has already placed their new poles on the project, from the beginning of the project to in front of the hospital. Bluegrass Energy is to place their new poles at the end of the project along the County Club and install the electric lines. Charter

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Communications and AT&T Kentucky will then follow along installing line work. Relocation of these utilities should be completed by February 15, 2018.

The Department will consider submission of a bid as the Contractor's agreement to not make any claims for additional compensation due to delays or other conditions created by the operations of Bluegrass Energy, AT&T Kentucky, and Time Warner Cable & Fiber (Charter). Working days will not be charged for those days on which work on Bluegrass Energy, AT&T Kentucky, and Time Warner Cable & Fiber (Charter) facilities is delayed, as provided in the current edition of the KY Standard Specifications for Road and Bridge Construction. Should a difference of opinion arise as to the rights of the Contractor and others working within the limits of, or adjacent to the project, the KYTC Resident Engineer will decide as to the respective rights of the various parties involved in order to assure the completion of the Department's work in general harmony and in a satisfactory manner, and his decision shall be final and binding upon the Contractor.

**THE FOLLOWING COMPANIES HAVE FACILITIES TO BE RELOCATED/ADJUSTED BY THE ROAD CONTRACTOR AS INCLUDED IN THIS CONTRACT**

City of Cynthiana Water & Sanitary has facilities that will be relocated by the road contractor as shown on the City of Cynthiana Water & Sanitary Relocation Plans inserted in the roadway plans and specifications contained in the proposal.

**THE FOLLOWING RAIL COMPANIES HAVE FACILITIES IN CONJUNCTION WITH THIS PROJECT AS NOTED**

**No Rail Involved**       **Minimal Rail Involved (See Below)**       **Rail Involved (See Below)**

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### **UNDERGROUND FACILITY DAMAGE PROTECTION – BEFORE YOU DIG**

The contractor shall make every effort to protect underground facilities from damage as prescribed in the Underground Facility Damage Protection Act of 1994, Kentucky Revised Statute KRS 367.4901 to 367.4917. It is the contractor's responsibility to determine and take steps necessary to be in compliance with federal and state damage prevention directives. The contractor is instructed to contact KY 811 for the location of existing underground utilities. Contact shall be made a minimum of two (2) and no more than ten (10) business days prior to excavation.

The contractor shall submit Excavation Locate Requests to the Kentucky Contact Center (KY 811) via web ticket entry. The submission of this request does not relieve the contractor from the responsibility of contacting non-member facility owners, whom are to be contacted through their individual Protection Notification Center. It may be necessary for the contractor to contact the County Court Clerk to determine what utility companies have facilities in the area. Non-compliance with these directives can result in the enforcement of penalties.

### **SPECIAL CAUTION NOTE – PROTECTION OF UTILITIES**

The contractor will be responsible for contacting all utility facility owners on the subject project to coordinate his activities. The contractor will coordinate his activities to minimize and, where possible, avoid conflicts with utility facilities. Due to the nature of the work proposed, it is unlikely to conflict with the existing utilities beyond minor facility adjustments. Where conflicts with utility facilities are unavoidable, the contractor will coordinate any necessary relocation work with the facility owner and Resident Engineer. The Kentucky Transportation Cabinet maintains the right to remove or alter portions of this contract if a utility conflict occurs.

The utility facilities as noted in the previous section(s) have been determined using data garnered by varied means and with varying degrees of accuracy: from the facility owners, a result of S.U.E., field inspections, and/or reviews of record drawings. The facilities defined may not be inclusive of all utilities in the project scope and are not Level A quality, unless specified as such. It is the contractor's responsibility to verify all utilities and their respective locations before excavating.

***Please Note: The information presented in this Utility Note is informational in nature and the information contained herein is not guaranteed.***

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### AREA UTILITIES CONTACT LIST

Utility Company/Agency                      Contact Name                      Contact Information

**Utility contact information will be provided at the preconstruction meeting.**



# **GENERAL UTILITY NOTES AND INSTRUCTIONS APPLICABLE TO ALL UTILITY WORK MADE A PART OF THE ROAD CONSTRUCTION CONTRACT**

The contractor should be aware the following utility notes and KYTC Utility Bid Item Descriptions shall supersede, replace and take precedence over any and all conflicting information that may be contained in utility owner supplied specifications contained in the contract, on plans supplied by the utility owner, or any utility owner specifications or information externally referenced in this contract.

Where information may have been omitted from these notes, bid item descriptions, utility owner supplied specifications or plans; the KYTC Standard Specifications for Road and Bridge Construction shall be referenced.

## **PROTECTION OF EXISTING UTILITIES**

The existing utilities shown on the plans are shown as best known at the time the plans were developed and are to be used as a guide only by the Contractor. The Contractor shall use all means at his disposal to accurately locate all existing utilities, whether shown on the plans or not, prior to excavation. The contractor shall protect these utilities during construction. Any damage to existing utilities during construction that are shown or not shown on the plans shall be repaired at the Contractor's expense.

## **PREQUALIFIED UTILITY CONTRACTORS**

Some utility owners may require contractors that perform relocation work on their respective facilities as a part of the road contract be prequalified or preapproved by the utility owner. Those utility owners with a prequalification or preapproval requirement are as follows:

***No contractors are required to be prequalified or preapproved by the utility owner(s) to perform utility relocation work under this contract.***

The bidding contractor needs to review the above list and choose from the list of approved subcontractors at the end of these general notes as identified above before bidding. When the list of approved subcontractors is provided, only subcontractors shown on the following list(s) will be allowed to work on that utility as a part of this contract.

When the list of approved subcontractors for the utility work is not provided in these general notes, the utility work can be completed by the prime contractor. If the prime contractor chooses to subcontract the work, the subcontractor shall be prequalified with the KYTC Division of Construction Procurement in the

work type of “Utilities” (I33). Those who would like to become prequalified may contact the Division of Construction Procurement at (502) 564-3500. Please note: it could take up to 30 calendar days for prequalification to be approved. The prequalification does not have to be approved prior to the bid, but must be approved before the subcontract will be approved by KYTC and the work can be performed.

#### CONTRACT ADMINISTRATION RELATIVE TO UTILITY WORK

All utility work is being performed as a part of a contract administered by KYTC; there is not a direct contract between the utility contractor and utility owner. The KYTC Section Engineer is ultimately responsible for the administration of the road contract and any utility work included in the contract.

#### SUBMITTALS AND CORRESPONDENCE

All submittals and correspondence of any kind relative to utility work included in the road contract shall be directed to the KYTC Section Engineer, a copy of which may also be supplied to the utility owner by the contractor to expedite handling of items like material approvals and shop drawings. All approvals and correspondence generated by the utility owner shall be directed to the KYTC Section Engineer. The KYTC Section Engineer will relay any approvals or correspondence to the utility contractor as appropriate. At no time shall any direct communication between the utility owner and utility contractor without the communication flowing through the KYTC Section Engineer be considered official and binding under the contract.

#### ENGINEER

Where the word “Engineer” appears in any utility owner specifications included in this proposal, utility owner specifications included as a part of this contract by reference or on the utility relocation plans, it shall be understood the “Engineer” is the Kentucky Transportation Cabinet (KYTC) Section Engineer or designated representative and the utility owner engineer or designated representative jointly. Both engineers must mutually agree upon all decisions made with regard to the utility construction. The Transportation Cabinet, Section Engineer shall make all final decisions in all disputes.

#### INSPECTOR OR RESIDENT PROJECT REPRESENTATIVE

Where the word “Inspector” or “Resident Project Representative” appears in the utility specifications included in this proposal, utility owner specifications included as a part of this contract by reference or on the utility relocation plans, it shall be understood the “Inspector” or “Resident Project Representative” is the utility owner inspector and KYTC inspector jointly. The Transportation Cabinet, Section Engineer shall make all final decisions in all disputes.

### NOTICE TO UTILITY OWNERS OF THE START OF WORK

One month before construction is to start on a utility, the utility contractor shall make notice to the KYTC Section Engineer and the utility owner of when work on a utility is anticipated to start. The utility contractor shall again make confirmation notice to the KYTC Section Engineer and the utility owner one week before utility work is to actually start.

### UTILITY SHUTDOWNS

The Contractor shall not shut down any active and in-service mains, utility lines or services for any reason unless specifically given permission to do so by the utility owner. The opening and closing of valves and operating of other active utility facilities for main, utility line or utility service shut downs are to be performed by the utility owner unless specific permission is given to the contractor by the owner to make shutdowns. If and when the utility owner gives the contractor permission to shutdown mains, utility lines or utility services, the contractor shall do so following the rules, procedures and regulations of the utility owner. Any permission given by the utility owner to the contractor to shutdown active and in-service mains, utility lines or services shall be communicated to the KYTC Section Engineer by the utility owner that such permission has been given.

Notice to customers of utility shut downs is sometimes required to be performed by the utility contractor. The contractor may be required; but, is not limited to, making notice to utility customers in a certain minimum amount of time in advance of the shut down and by whatever means of communication specified by the utility owner. The means of communication to the customer may be; but is not limited to, a door hanger, notice by newspaper ad, telephone contact, or any combination of communication methods deemed necessary, customary and appropriate by the utility owner. The contractor should refer to the utility owner specifications for requirements on customer notice.

Any procedure the utility owner may require the contractor to perform by specification or plan note and any expense the contractor may incur to comply with the utility owner's shut down procedure and notice to customers shall be considered an incidental expense to the utility construction.

CUSTOMER SERVICE AND LATERAL ABANDONMENTS When temporary or permanent abandonment of customer water, gas, or sewer services or laterals are necessary during relocation of utilities included in the contract, the utility contractor shall perform these abandonments as part of the contract as incidental work. No separate payment will be made for service line and lateral abandonments. The contractor shall provide all labor, equipment and materials to accomplish the temporary or permanent abandonment in accordance with the plans, specifications and/or as directed by the engineer. Abandonment may include, but is not limited to, digging down on a water or gas main at the tap to turn off the tap valve or corporation stop and/or capping or plugging the tap, digging down on a sewer tap at the main and plugging or capping the tap, digging down on a service line or lateral at a location shown on the plans or agreeable to the engineer and capping or plugging, or performing any other work necessary to abandon the service or lateral to satisfactorily accomplish the final utility relocation.

### STATIONS AND DISTANCES

All stations and distances, when indicated for utility placement in utility relocation plans or specifications, are approximate; therefore, some minor adjustment may have to be made during construction to fit actual field conditions. Any changes in excess of 6 inches of plan location shall be reviewed and approved jointly by the KYTC Section Engineer or designated representative and utility owner engineer or designated representative. Changes in location without prior approval shall be remedied by the contractor at his own expense if the unauthorized change creates an unacceptable conflict or condition.

### RESTORATION

Temporary and permanent restoration of paved or stone areas due to utility construction shall be considered incidental to the utility work. No separate payment will be made for this work. Temporary restoration shall be as directed by the KYTC Section Engineer. Permanent restoration shall be "in-kind" as existing.

Restoration of seed and sod areas will be measured and paid under the appropriate seeding and sodding bid items established in the contract for roadway work.

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BELOW ARE NOTES FOR WHEN "INST" ITEMS ARE IN THE CONTRACT MEANING THE UTILITY COMPANY IS PROVIDING CERTAIN MATERIALS FOR UTILITY RELOCATION

### MATERIAL

Contrary to Utility Bid Item Descriptions, those bid items that have the text "**Inst**" at the end of the bid item will have the major components of the bid item provided by the utility owner. No direct payment will be made for the major material component(s) supplied by the utility company. All remaining materials required to construct the bid item as detailed in utility bid item descriptions, in utility specifications and utility plans that are made a part of this contract will be supplied by the contractor. The contractor's bid price should reflect the difference in cost due to the provided materials.

The following utility owners have elected to provide the following materials for work under this contract:

***No materials are being supplied by the utility owner(s). All materials are to be supplied by the contractor per bid item descriptions, utility specifications and utility plans.***

### SECURITY OF SUPPLIED MATERIALS

If any utility materials are to be supplied by the utility owner, it will be the responsibility of the utility contractor to secure all utility owner supplied materials after delivery to the project site. The utility contractor shall coordinate directly with the utility owner and their suppliers for delivery and security of the supplied materials. Any materials supplied by the utility owner and delivered to the construction site that are subsequently stolen, damaged or vandalized and deemed unusable shall be replaced with like materials at the contractor's expense.

# **SPECIAL UTILITY BID ITEM DESCRIPTIONS**

## **Sewer Special Bid Item Descriptions**

### **S MANHOLE SPECIAL – 5 FT. DIA.**

This bid item includes all labor, equipment and materials for the installation of a new 5-foot interior diameter sanitary sewer manhole. Payment for manholes will be made at the contract unit price each, in place complete and ready for use at the locations shown on plans in accordance with specifications and standard drawings. Manholes shall include concrete base, barrel sections, cone section or top slab, steps, excavation, backfill, air testing, restoration, and cleanup. All materials shall be new and unused. Anchoring of casting shall be considered incidental to this bid item. No additional compensation will be paid for manhole height variances. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

# Standard Water Bid Item Descriptions

**W AIR RELEASE VALVE** This bid item description shall apply to all air release valve installations of every size except those defined as “Special”. This item shall include the air release valve, main to valve connecting line or piping, manhole, vault, structure, access casting or doors, tapping the main, labor, equipment, excavation, proper backfill and restoration required to install the air release valve at the location shown on the plans or as directed in accordance with the specifications and standard drawings complete and ready for use. All air release/vacuum valves on a project shall be paid under one bid item regardless of size. No separate pay items will be established for size variations. Only in the case of the uniqueness of a particular air release valve would a separate bid item be established. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**BOLLARDS** This item is for payment for furnishing and installing protective guard posts at above ground utility installations. A bollard may consist of, but not limited to, a steel post set in concrete or any other substantial post material. This item shall include all labor, equipment, and materials needed for complete installation of the bollard as specified by the utility owner specifications and plans. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

*NOTE: A bid code for this item has been established in standard roadway bid items and shall be used for payment of this item. The bid code is 2134IND*

**W CAP EXISTING MAIN** This item shall include the specified cap, concrete blocking and/or mechanical anchoring, labor, equipment, excavation, backfill, and restoration required to install the cap at the location shown on the plans or as directed in accordance with the specifications. This item is not to be paid on new main installations. This pay item is only to be paid to cap existing mains. Caps on new mains are incidental to the new main. Any and all caps on existing mains shall be paid under one bid item included in the contract regardless of size. No separate bid items will be established for size variations. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W DIRECTIONAL BORE** Payment under this item is made whenever the plans or specifications specifically show directional boring is to be utilized in order to minimize the impact of open cut for the installation of water main under streets, creeks, and etc. Payment under this item shall include the specified bore pipe, labor, and equipment. No separate payment shall be made for bore pipe installed in the bore whether used as a carrier pipe or an encasement of a separate carrier pipe. This item shall also include pipe anchors at each end of the bore when specified to prevent the creep or contraction of the bore pipe. Carrier pipe installed within a bore pipe shall be paid separately under pipe items. Payment under this item shall not be size specific and no separate bid items will be established for size variations. The bore pipe sizes to be included under this item shall be as shown on the plans and/or in the specifications. Any and all directional bores in each contract shall be paid under one directional bore bid item included in the contract regardless of size. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

**W ENCASEMENT CONCRETE** Includes all labor, equipment, excavation, concrete, reinforcing steel, backfill, restoration, and etc., to construct the concrete encasement of the water main as shown on the plans, and in accordance with the specifications and standard drawings. Payment under this item shall be in addition to the carrier pipe as paid under separate bid items. Carrier pipe is not included in this bid item. Any and all concrete encasement shall be paid under one bid item included in the contract regardless of the size of the carrier pipe or the volume of concrete or steel reinforcement as specified in the plans and specifications. No separate bid items will be established for size variations. Measurement of pay quantity shall be from end of concrete to end of concrete. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

**W ENCASEMENT STEEL BORED** This item shall include the steel encasement pipe size as specified on the plans and in the specifications, casing spacers, end seals, labor, and equipment to bore and install the encasement in accordance with the plans and specifications, complete and ready for use. The size shall be the measured internal diameter of the encasement pipe. The sizes of encasement to be paid under the size ranges specified in the bid items shall be as follows:

- Range 1 = All encasement sizes greater than 2 inches to and including 6 inches
- Range 2 = All encasement sizes greater than 6 inches to and including 10 inches
- Range 3 = All encasement sizes greater than 10 inches to and including 14 inches
- Range 4 = All encasement sizes greater than 14 inches to and including 18 inches
- Range 5 = All encasement sizes greater than 18 inches to and including 24 inches
- Range 6 = All encasement sizes greater than 24 inches

*(Encasement sizes of 2 inches internal diameter or less shall not be paid separately; but, shall be considered incidental to the carrier pipe.)* Payment under this bid item shall not include the carrier pipe. Carrier pipe shall be paid under a separate bid item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

**W ENCASEMENT STEEL OPEN CUT** This item shall include the steel encasement pipe size as specified on the plans and in the specifications, casing spacers, end seals, labor, and equipment to open cut and install the encasement in accordance with the plans and specifications, complete and ready for use. The size shall be the measured internal diameter of the encasement pipe. The size encasement to be paid under the size ranges specified in the bid items shall be as follows:

- Range 1 = All encasement sizes greater than 2 inches to and including 6 inches
- Range 2 = All encasement sizes greater than 6 inches to and including 10 inches
- Range 3 = All encasement sizes greater than 10 inches to and including 14 inches
- Range 4 = All encasement sizes greater than 14 inches to and including 18 inches
- Range 5 = All encasement sizes greater than 18 inches to and including 24 inches
- Range 6 = All encasement sizes greater than 24 inches

*(Encasement sizes of 2 inches internal diameter or less shall not be paid separately; but, shall be considered incidental to the carrier pipe.)* Payment under this bid item shall not include the carrier pipe. Carrier pipe shall be paid under a separate bid item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

**W FIRE HYDRANT ADJUST** Includes all labor, equipment, excavation, materials, and backfill to adjust the existing fire hydrant using the fire hydrant manufacturer's extension kit for adjustments of 18" or less. Adjustments greater than 18" require anchoring couplings and vertical bends to adjust to grade. The Contractor will supply and install all anchor couplings, bends, fire hydrant extension, concrete blocking, restoration, granular drainage material, etc. needed to adjust the fire hydrant complete and ready for use as shown on the plans, and in accordance with the specifications and standard drawings. This also includes allowing for the utility owner inspector to inspect the existing fire hydrant prior to adjusting, contractor returning unusable fire hydrants to the utility owner warehouse and picking up a replacement hydrant. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete and ready for use.

**W FIRE HYDRANT ASSEMBLY** Includes all labor, equipment, new fire hydrant, isolating valve and valve box, concrete pad around valve box (when specified in specifications or plans), piping, anchoring tee, anchoring couplings, fire hydrant extension, excavation, concrete blocking, granular drainage material, backfill, and restoration, to install a new fire hydrant assembly as indicated on plans and on standard drawings complete and ready for use. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W FIRE HYDRANT RELOCATE** This item includes all labor and equipment to remove the existing fire hydrant from its existing location and reinstalling at a new location. This item shall include a new isolating valve and valve box, concrete pad around valve box (when required in specifications or plans), new piping, new anchoring tee, anchoring couplings, fire hydrant extensions, concrete blocking, restoration, granular drainage material, excavation, and backfill as indicated on plans, specifications, and on standard drawings complete and ready for use. This item shall also include allowing for utility owner inspector to inspect the existing fire hydrant prior to reuse, contractor returning unusable fire hydrants to the utility owner warehouse and picking up a replacement hydrant for use, if the existing fire hydrant is determined unfit for reuse. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W FIRE HYDRANT REMOVE** This bid item includes removal of an abandoned fire hydrant, isolating valve, and valve box to the satisfaction of the engineer. The removed fire hydrant, isolating valve and valve box shall become the property of the contractor for his disposal as salvage or scrap. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W FLUSH HYDRANT ASSEMBLY** This item shall include the flushing hydrant assembly, service line, tapping the main, labor, equipment, excavation, backfill, and restoration required to install the flush hydrant at the location shown on the plans and in accordance with the specifications and standard drawings, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W FLUSHING ASSEMBLY** This item shall include the flushing device assembly, service line, meter box and lid, tapping the main, labor, equipment, excavation, backfill, and restoration required to install the



flushing device at the location shown on the plans and in accordance with the specifications and standard drawings, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W LEAK DETECTION METER** This item is for payment for installation of a water meter at main valve locations where shown on the plans for detection of water main leaks. The meter shall be of the size and type specified in the plans or specifications. This item shall include all labor, equipment, meter, meter box or vault, connecting pipes between main and meter, main taps, tapping saddles, casting, yoke, and any other associated material needed for installation of a functioning water meter in accordance with the plans and specifications, complete and ready for use. No separate payment will be made under any other contract item for connecting pipe or main taps. Any and all leak detection meters shall be paid under one bid item included in the contract regardless of size. No separate bid items will be established for size variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete and ready for use.

**W LINE MARKER** This item is for payment for furnishing and installing a water utility line marker as specified by the utility owner specifications and plans. A line marker may consist of a post or monument of whatever materials specified and shall include markings and/or signage on same as specified by plans or specifications. This item shall include all labor, equipment, and materials needed for complete installation of the marker. This item shall be paid EACH (EA) when complete.

**W MAIN POINT RELOCATE** This item is intended for payment for horizontal and/or vertical relocation of a short length of an existing main at the locations shown on the plans. This bid item is to be used to relocate an existing water main at point locations such as to clear a conflict at a proposed drainage structure, pipe or any other similar short relocation situation, and where the existing pipe material is to be reused. The contractor shall provide any additional pipe or fitting material needed to complete the work as shown on the plans and specifications. The materials provided shall be of the same type and specification as those that exist. Substitution of alternative materials shall be approved by the engineer in advance on a case by case basis. New polyethylene wrap is to be provided (if wrap exists or is specified in the specifications to be used). If it is necessary that the pipe be disassembled for relay, payment under this item shall also include replacement of joint gaskets as needed. Bedding and backfill shall be provided and performed the same as with any other pipe installation as detailed in the plans and specifications. Payment under this item shall be for each location requiring an existing main to be relocated horizontally or vertically regardless of pipe size or relocation length. No separate pay items will be established for pipe size variations or relocation segment length variations. Water Main Relocate shall not be paid on a linear feet basis; but, shall be Paid EACH (EA) at each location when complete and placed in service. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced.

**W METER** This item is for payment for installation of all standard water meters of all sizes 2 inches ID or less as specified on the plans. This item shall include all labor, equipment, meter, meter box, casting, yoke, and any other associated material needed for installation of a functioning water meter in accordance with the plans and specifications, complete and ready for use. This item shall include connections to the new or existing water service line. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W METER ADJUST** This item includes all labor, equipment, excavation, materials, backfill, restoration, and etc., to adjust the meter casting to finished grade (whatever size exists) at the location shown on the plans or as directed in accordance with the specifications and standard drawings complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W METER RELOCATE** This item includes all labor, equipment, excavation, additional fittings, disinfection, testing, restoration, and etc., to relocate the existing water meter (whatever size exists), meter yoke, meter box, casting, and etc., from its old location to the location shown on the plans or as directed, in accordance with the specifications and standard drawings complete and ready for use. The new service pipe (if required) will be paid under short side or long side service bid items. Any and all meter relocations of 2 inches or less shall be paid under one bid item included in the contract regardless of size. Each individual relocation shall be paid individually under this item; however, no separate bid items will be established for meter size variations of 2 inches ID or less. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W METER VAULT SIZE RANGE 1 OR 2** This item is for payment for installation of an underground structure for housing of a larger water meter, fittings, and valves as required by the plans and specifications. This item shall include all labor, equipment, excavation, concrete, manhole castings or access doors, the specified meter(s) valve(s), all piping, and fitting materials associated with installing a functioning meter and vault in accordance with the plans, standard drawings, and specifications, complete and ready for use. The size shall be the measured internal diameter of the meter and piping to be installed. The size meter vault to be paid under size 1 or 2 shall be as follows:

Size Range 1 = All meter and piping sizes greater than 2 inches up to and including 6 inches  
Size Range 2 = All meter and piping sizes greater than 6 inches

This item shall be paid EACH (EA) when complete. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced.

**W METER/FIRE SERVICE COMBO VAULT** This item is for payment for installation of an underground structure for housing of a water meter and fire service piping, fittings, and valves as required by the plans and specifications. This item shall include all labor, equipment, excavation, concrete, manhole castings or access doors, the specified meter(s), valve(s), all piping, and fitting materials associated with installing a functioning meter and fire service vault in accordance with the plans and specifications, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W METER WITH PRESSURE REDUCING VALVE (PRV)** This item is for payment for installation of all standard water meters with pressure reducing valves (PRV) of all sizes 2 inches ID or less as specified on the plans. This item shall include all labor, equipment, meter, PRV, meter box, casting, yoke, and any other associated material needed for installation of a functioning water meter with PRV in accordance with the plans and specifications, complete and ready for use. This item shall include connections to the new or existing water service line. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced.

This item shall be paid EACH (EA) when complete.

**W PIPE** This description shall apply to all PVC, ductile iron, and polyethylene/plastic pipe bid items of every size and type to be used as water main, except those bid items defined as “Special”. This item includes the pipe specified by the plans and specifications, all fittings (including, but not limited to, bends, tees, reducers, plugs, and caps), tracing wire with test boxes (if required by specification), polyethylene wrap (when specified), labor, equipment, excavation, bedding, restoration, testing, sanitizing, backfill, and etc., required to install the specified new pipe and new fittings at the locations shown on the plans, or as directed, in accordance with the specifications and standard drawings complete and ready for use. No additional payment will be made for rock excavation. This bid item includes material and placement of flowable fill under existing and proposed pavement, and wherever else specified on the plans or in the specifications. **This item shall include all temporary and permanent materials and equipment required to pressure test and sanitize mains including, but not limited to, pressurization pumps, hoses, tubing, gauges, main taps, saddles, temporary main end caps or plugs and blocking, main end taps for flushing, chlorine liquids or tablets for sanitizing, water for testing/sanitizing and flushing (when not supplied by the utility), chlorine neutralization equipment and materials, and any other items needed to accomplish pressure testing and sanitizing the main installation.** This item shall also include pipe anchors, at each end of polyethylene pipe runs when specified to prevent the creep or contraction of the pipe. Measurement of quantities under this item shall be through fittings, encasements, and directional bores (only when a separate carrier pipe is specified within the directional bore pipe). Measurements shall be further defined to be to the center of tie-in where new pipe contacts existing pipe at the center of connecting fittings, to the outside face of vault or structure walls, or to the point of main termination at dead ends. No separate payment will be made under pipe items when the directional bore pipe is the carrier pipe. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

**W PLUG EXISTING MAIN** This item shall include the specified plug, concrete blocking and/or anchoring, labor, equipment, excavation, backfill, and restoration required to install the plug in an existing in-service main that is to remain at the location shown on the plans or as directed in accordance with the specifications. Any and all plugs on all existing in-service mains shall be paid under one bid item included in the contract regardless of size. No separate bid items will be established for size variations. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

*NOTE: This utility bid item is not to be paid on new main installations or abandoned mains. This pay item is to plug existing in-service mains only. Plugs on new mains are incidental to the new main just like all other fittings.*

*NOTE: Plugging of existing abandon mains shall be performed and paid in accordance with Section 708.03.05 of KYTC Standard Specifications For Road And Bridge Construction and paid using Bid Code 01314 Plug Pipe.*

**W PRESSURE REDUCING VALVE** This description shall apply to all pressure reducing valves (PRV) of every size required in the plans and specifications except those bid items defined as “Special”. Payment under this description is to be for PRVs being installed with new main. This item includes the PRV as specified in the plans and specifications, polyethylene wrap (if required by specification), labor, equipment, excavation, anchoring (if any), pit or vault, backfill, restoration, testing, disinfection, and etc., required to install the specified PRV at the location shown on the plans in accordance with the specifications and standard drawings complete and ready for use. If required on plans and/or proposed adjoining DIP is restrained, PRVs shall be restrained. PRV restraint shall be considered incidental to the

PRV and adjoining pipe. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W PUMP STATION** This item is for payment for installation of pumps and an above or below ground structure for housing of the pumps. This item shall include all pumps, piping, fittings, valves, electrical components, building materials, concrete, any other appurtenances, labor, equipment, excavation, and backfill, to complete the pump station installation as required by the plans, standard drawings, and specifications, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LUMP SUM (LS) when complete.

**W REMOVE TRANSITE (AC) PIPE** This item shall include all labor, equipment, and materials needed for removal and disposal of the pipe as hazardous material. All work shall be performed by trained and certified personnel in accordance with all environmental laws and regulations. Any and all transite AC pipe removed shall be paid under one bid item included in the contract regardless of size. No separate bid items will be established for size variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

**W SERVICE LONG SIDE** This bid item description shall apply to all service line installations of every size bid up to and including 2 inch inside diameter, except those service bid items defined as "Special". This item includes the specified piping material, main tap, tapping saddle (if required), and corporation stop materials, coupling for connecting the new piping to the surviving existing piping, encasement of 2 inches or less internal diameter (if required by plan or specification), labor, equipment, excavation, backfill, testing, disinfection, and restoration, at the locations shown on the plans or as directed, in accordance with the specifications and standard drawings, complete and ready for use. This bid item is to pay for service installations where the ends of the service connection are on opposite sides of the public roadway and the service line crosses the centerline of the public roadway as shown on the plans. The length of the service line is not to be specified. Payment under this item shall not be restricted by a minimum or maximum length. The contractor shall draw his own conclusions as to the length of piping that may be needed. Payment under this item shall include boring, jacking, or excavating across the public roadway for placement. Placement of a service across a private residential or commercial entrance alone shall not be reason to make payment under this item. Private or commercial entrances shall not be considered a public roadway in defining payment under this item. This pay item does not include installation or relocation of meters. Meters will be paid separately. No additional payment will be made for rock excavation or for special bedding required in rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W SERVICE SHORT SIDE** This bid item description shall apply to all service line installations of every size up to and including 2 inch internal diameter, except those service bid items defined as "Special". This item includes installation of the specified piping material of the size specified on plans, encasement of 2 inches or less internal diameter (if required by plan or specification), main tap, tapping saddle (if required), corporation stop, coupling for connecting the new piping to the surviving existing piping, labor, equipment, excavation, backfill, testing, disinfection, and restoration, at the locations shown on the plans or as directed, in accordance with the specifications and standard drawings, complete and

ready for use. This bid item is to pay for service installations where both ends of the service connection are on the same side of the public roadway, or when an existing service crossing a public roadway will remain and is being extended, reconnected, or relocated with all work on one side of the public roadway centerline as shown on the plans. The length of the service line is not to be specified and shall not be restricted to any minimum or maximum length. Payment shall be made under this item even if the service crosses a private residential or commercial entrance; but, not a public roadway. Private or commercial entrances shall not be considered a public roadway in defining payment under this item. The contractor shall draw his own conclusions as to the length of piping that may be needed. This pay item does not include installation or relocation of meters. Meters will be paid separately. No additional payment will be made for rock excavation or for bedding required in rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W SERVICE RELOCATE** This item is for the relocation of an existing water service line where a meter is not involved, and where an existing service line can easily be adjusted by excavating alongside and moving the line horizontally and/or vertically a short distance without cutting the service line to avoid conflicts with road construction. This item shall include excavation, labor, equipment, bedding, and backfill to relocate the line in accordance with the plans and specifications complete and ready for use. Payment under this item shall be for each location requiring relocation. Payment shall be made under this item regardless of service size or relocation length. No separate pay items will be established for size or length variation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W STRUCTURE ABANDONMENT** This item is to be used to pay for abandonment of larger above or below ground water structures such as meter vaults, fire pits, pump stations, tanks, and etc. Payment under this item shall not be limited to size or scope; however structures with connecting pipes of 2 inches or less shall not be paid under this item; but, shall be considered incidental to water construction, (i.e., abandonment of standard water meters up to and including 2 inches would not be paid under this item). Payment under this item shall include all labor, equipment, and compacted fill or flowable fill for abandonment of the structure in place and restoration complete. No separate bid items will be established for size or structure variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W STRUCTURE REMOVAL** This item is to be used to pay for removal of larger above or below ground water structures such as meter vaults, fire pits, pump stations, tanks, and etc. Payment under this item shall not be limited to size or scope; however structures with connecting pipes of 2 inches or less shall not be paid under this item; but, shall be considered incidental to water construction, (i.e., removal of standard water meters up to and including 2 inches would not be paid under this item). Payment under this item shall include all labor, equipment, and compacted backfill for removal of the structure and restoration complete. No separate bid items will be established for size or structure variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W TAPPING SLEVE AND VALVE SIZE 1 OR 2** This item shall include the specified tapping sleeve, valve, valve box, concrete pad around valve box (when required in specifications or plans), labor, and equipment to install the specified tapping sleeve and valve, complete and ready for use in accordance with

the plans and specifications. The size shall be the measured internal diameter of the live pipe to be tapped. The size tapping sleeve and valve to be paid under sizes 1 or 2 shall be as follows:

Size 1 = All live tapped main sizes up to and including 8 inches

Size 2 = All live tapped main sizes greater than 8 inches

Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W TIE-IN** This bid description shall be used for all main tie-in bid items of every size except those defined as "Special". This item includes all labor, equipment, excavation, fittings, sleeves, reducers, couplings, blocking, anchoring, restoration, disinfection, testing and backfill required to make the water main tie-in as shown on the plans, and in accordance with the specifications complete and ready for use. Pipe for tie-ins shall be paid under separate bid items. This item shall be paid EACH (EA) when complete.

**W VALVE** This description shall apply to all valves of every size required in the plans and specifications except those bid items defined as "Special". Payment under this description is to be for gate or butterfly valves being installed with new main. This item includes the valve as specified in the plans and specifications, polyethylene wrap (if required by specification), labor, equipment, excavation, anchoring (if any), valve box and valve stem extensions, backfill, concrete pad around valve box (if required by specification), restoration, testing, disinfection, and etc., required to install the specified valve at the location shown on the plans in accordance with the specifications and standard drawings complete and ready for use. If required on plans and/or proposed adjoining DIP is restrained, valves shall be restrained. Valve restraint shall be considered incidental to the valve and adjoining pipe. This description does not apply to cut-in valves. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W VALVE ANCHOR EXISTING** This bid item is intended to pay for installation of restraint hardware on an existing valve where no restraint exists to hold the valve in place to facilitate tie-ins and other procedures where restraint is prudent. This work shall be performed in accordance with water specifications and plans. This bid item shall include all labor equipment, excavation, materials and backfill to complete restraint of the designated valve, regardless of size, at the location shown on the plans, complete and ready for use. Materials to be provided may include, but is not limited to, retainer glands, lugs, threaded rod, concrete, reinforcing steel or any other material needed to complete the restraint. Should the associated valve box require removal to complete the restraint, the contractor shall reinstall the existing valve box, the cost of which shall be considered incidental to this bid item. No separate bid items are being provided for size variations. All sizes shall be paid under one bid item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W VALVE BOX ADJUST** Includes all labor, equipment, valve box and valve stem extensions (if required), excavation, backfill, concrete pad around valve box (when specified in specifications or plans), restoration, and etc., to adjust the top of the box to finished grade complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W VALVE CUT-IN** This bid description is for new cut-in valve installations of all sizes where installation is accomplished by cutting out a section of existing main. This item shall include cutting the existing pipe, supplying the specified valve, couplings or sleeves, valve box, concrete pad around valve box (when required in specifications or plans), labor, equipment, and materials to install the valve at the locations shown on the plans, or as directed by the engineer, complete and ready for use. Any pipe required for installation shall be cut from that pipe removed or supplied new by the contractor. No separate payment will be made for pipe required for cut-in valve installation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**W VALVE VAULT** This item is for payment for installation of an underground structure for housing of specific valve(s) as required by the plans and specifications. This item shall include all labor, equipment, excavation, concrete, manhole castings or doors, the specified valve(s), all piping, and fitting materials associated with installing a functioning valve vault in accordance with the plans, standard drawing, and specifications, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

# Technical Specifications

for

## KY 32 Intersection Improvements at Hospital Utility Relocation

FD04 049 0032 010-011

Item No. 06-0908.00

Harrison County, Kentucky

City of Cynthiana

March 2016

*Prepared by:*

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CON0104746





**CITY OF CYNTHIANA  
KY 32 INTERSECTION IMPROVEMENTS AT HOSPITAL  
UTILITY RELOCATION**

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## **SECTION 02225**

### **EXCAVATING, BACKFILLING, AND COMPACTING FOR UTILITIES**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. The Contractor shall make excavations in such widths and depths as will give suitable room for laying pipe to the lines, grades and elevations shown, and shall furnish, place and compact all backfill materials specified herein or denoted on the Drawings. The materials, equipment, labor, etc., required herein are to be considered as part of the requirements and costs for installing the various pipes, structures and other items they are incidental to.

##### **1.2 RELATED WORK**

- A. Section 02610 - Water Pipe and Fittings.
- B. Section 02732 – Sewage Force Mains.

#### **PART 2 - PRODUCTS**

##### **2.1 MATERIALS**

- A. Crushed stone material shall conform with the requirements of the applicable sections of the Kentucky Bureau of Highways Standard Specifications and shall consist of clean, hard, and durable particles or fragments, free from dirt, vegetation or objectionable materials.
- B. Two classes of crushed stone material are used in this Section. The type of material in each class is as follows:
  - 1. Class I - No. 9 Aggregate.
  - 2. Class II - Dense Graded Aggregate (DGA).

#### **PART 3 - EXECUTION**

##### **3.1 EXCAVATION OF TRENCHES**

- A. Unless otherwise directed by the Engineer, trenches are to be excavated in open cuts.
  - 1. 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.
  - 2. 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.
- B. Trenches shall be sufficient width to provide working space on each side of the pipe and to permit proper backfilling around the pipe.
  - 1. The Contractor shall remove only as much of any existing pavement as is necessary for the prosecution of the Work. The pavement shall be cut with pneumatic tools, without extra compensation to the Contractor, to prevent damage to the remaining road surface. Where pavement is removed in large pieces, it shall be disposed of before proceeding with the excavation.

- C. All excavated materials shall be placed a safe distance back from the edge of the trench.
- D. Unless specifically directed otherwise by the Engineer, not more than 500 feet of trench shall be opened ahead of the pipe laying work of any one crew, and not more than 500 feet of open ditch shall be left behind the pipe laying work of any one crew. Watchmen or barricades, lanterns and other such signs and signals as may be necessary to warn the public of the dangers in connection with open trenches, excavations and other obstructions, shall be provided by and at the expense of the Contractor.
- E. When so required, or when directed by the Engineer, only one-half of street crossings and road crossings shall be excavated before placing temporary bridges over the side excavated, for the convenience of the traveling public. All backfilled ditches shall be maintained in such manner that they will offer no hazard to the passage of traffic. The convenience of the traveling public and the property owners abutting the improvements shall be taken into consideration. All public or private drives shall be promptly backfilled or bridged at the direction of the Engineer.
- F. Trench excavation shall include the removal of earth, rock, or other materials encountered in the excavation to the depth and extent shown or indicated on the Drawings.

### **3.2 WATER PIPE AND FORCE MAIN PIPE BEDDING**

- A. Piping for water mains and sanitary force mains shall be supported as follows:
  - 1. The trench bottom for water main and force main piping shall be stable, continuous, relatively smooth and free of frozen material, clodded dirt, foreign material and rock or granular material larger than 1/2 inch in diameter. The foundation for water main and force main piping shall be prepared so that the entire load of the backfill on top of the pipe will be carried uniformly on the barrel of the pipe. Any uneven areas in the trench bottom shall be shaved-off or filled-in with Class I granular bedding. When the trench is made through rock, the bottom shall be lowered to provide 6 inches of clearance around the pipe. Class I granular bedding shall be used to bring the trench bottom to grade.
- B. After each pipe has been brought to grade, aligned, and placed in final position, earth material for water main and force main piping in areas not subject to vehicular traffic and Class I material for water mains and force mains in paved areas, shall be deposited and densified under the pipe haunches and on each side of the pipe up to the spring line of the pipe to prevent lateral displacement and hold the pipe in proper position during subsequent pipe jointing, bedding, and backfilling operations.
- C. 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.
- D. 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.
- E. 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 Class I bedding material can be placed.
- F. It should be noted that no pipe shall be laid on solid or blasted rock.
- G. Pipe bedding as required in this Section is **not** considered a separate pay item.

### **3.3 WATER PIPE AND FORCE MAIN PIPE BACKFILLING**

- A. Initial Backfill:

1. This backfill is defined as that material which is placed over the pipe from the spring line to a point 6 inches above the top of the pipe. For water main and force main piping in areas not subject to vehicular traffic, initial backfill material shall be earth material free of rocks, acceptable to the Engineer or with Class I material when a condition exists mentioned in Paragraph A, 3. below. For water main and force main piping in paved areas, initial backfill shall be Class I material.
  2. Material used, whether earth or Class I, in the initial backfilling is **not** a separate pay item. Payment for the material is included in the unit price per linear foot of water main or force main.
  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 as set forth in Paragraph A.1, 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.
- B. Final Backfill:
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, parking areas, and walks.
  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 6 inches above the top of the pipe. The method of final backfilling for each of the above cases is as follows:
    - a. Case I - The trench shall be backfilled from a point 6 inches above the top of the pipe to a point 8 inches below the surface of the ground with earth material free from large rock (greater than 6 inches in the longest dimension), acceptable to the Engineer. The remainder of the trench shall be backfilled with earth material reasonably free of any rocks.
    - b. Case II - The trench shall be backfilled from a point 6 inches above the top of the pipe to a point 12 inches below the existing pavement surface with Class I (No. 9 crushed stone aggregate) material. The backfill shall be mechanically tamped in approximately 6-inch layers to obtain the maximum possible compaction. The remaining backfill shall be as follows:
      - c. For gravel surfaces - Class II (dense graded aggregate) material mechanically tamped to maximum possible compaction. The trench may be left with a slight mound if permitted by the Engineer.
      - d. For bituminous and concrete surfaces - Bituminous and concrete pavement sections as detailed on the Drawings and as specified for Bituminous Pavement Replacement and Concrete Pavement Replacement.
  3. Earth and Class I material used in final backfill is not a separate pay item. Payment shall be included in the price of water main.
  4. Class II material used in final backfill shall be included in the unit price of the pipe.
- C. A sufficient amount of Class II material shall be stockpiled to ensure immediate replacement by the Contractor of any settled areas. No extra payment will be made for the filling in of settled or washed areas by the Contractor.
- D. Excavated materials from trenches, in excess of 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 Drawings or noted in these Specifications. The cost of disposal of excess excavated materials, as set forth herein, no additional compensation being allowed for hauling or overhaul.

### 3.4 GRAVITY SEWER PIPE BEDDING

- A. Piping for gravity sewers shall be supported as follows: All gravity sewer piping shall be laid on a bed of granular material except when a concrete encasement situation occurs. All pipe bedding material shall be Class I (No. 9 crushed stone aggregate) and shall be placed to a depth of 4 inches in an earth trench and 6 inches in a rock trench. Aggregate bedding shall be graded to provide for a uniform and continuous support beneath the pipe at all points.
- B. After each pipe has been brought to grade, aligned, and placed in final position, Class I material for gravity sewer piping shall be deposited and densified under the pipe haunches and on each side of the pipe up to the spring line of the pipe to prevent lateral displacement and hold the pipe in proper position during subsequent pipe jointing, bedding, and backfilling operations.
- C. 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.
- D. 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.
- E. 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 Class I bedding material can be placed.
- F. It should be noted that no pipe shall be laid on solid or blasted rock.
- G. Pipe bedding, as required in this Section, is **not** considered a separate pay item.

### 3.5 GRAVITY SEWER BACKFILL

- A. Initial Backfill:
  - 1. This backfill is defined as that material which is placed over the pipe from the spring line to a point 6 inches above the top of the pipe. For gravity sewer piping the material shall be Class I (No. 9 crushed stone aggregate) and may be machine placed without compaction. Uneven places in the backfill shall be leveled by hand.
  - 2. Material used, whether earth or Class I, in the initial backfilling is **not** a separate pay item. Payment for the material is included in the unit price per linear foot of gravity sewer.
  - 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 as set forth in Paragraph A.1, 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.
- B. Final Backfill:
  - 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, parking areas, and walks.
  - 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 6 inches above the top of the pipe. The method of final backfilling for each of the above cases is as follows:

- a. Case I - The trench shall be backfilled from a point 6 inches above the top of the pipe to a point 8 inches below the surface of the ground with earth material free from large rock (greater than 6 inches in the longest dimension), acceptable to the Engineer. The remainder of the trench shall be backfilled with earth material reasonably free of any rocks.
  - b. Case II - The trench shall be backfilled from a point 6 inches above the top of the pipe to a point 12 inches below the existing pavement surface with Class I (No. 9 crushed stone aggregate) material. The backfill shall be mechanically tamped in approximately 6-inch layers to obtain maximum possible compaction. The remaining backfill shall be as follows:
    - c. For gravel surfaces - Class II (dense graded aggregate) material mechanically tamped to maximum possible compaction. The trench may be left with a slight mound if permitted by the Engineer.
    - d. For bituminous and concrete surfaces - Bituminous and concrete pavement sections as detailed on the Drawings and as specified for Bituminous Pavement Replacement and Concrete Pavement Replacement.
  3. Earth and Class I material used in final backfill is not a separate pay item. Payment shall be included in the price of gravity sewer.
  4. Class II material used in final backfill shall be included in the unit price for gravity sewer.
- C. A sufficient amount of Class II material shall be stockpiled to insure immediate replacement by the Contractor of any settled areas. No extra payment will be made for the filling in of settled or washed areas by the Contractor.
- D. Excavated materials from trenches, in excess of 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 Drawings or noted in these Specifications. The cost of disposal of excess excavated materials, as set forth herein, no additional compensation being allowed for hauling or overhaul.

### **3.6 PLACEMENT OF IDENTIFICATION TAPE**

- A. Detectable underground marking tape shall be placed over all utility lines. Care shall be taken to insure that the buried marking tape is not broken when installed and shall be Lineguard brand encased aluminum foil, Type III. The identification tape is manufactured by Lineguard, Inc., P.O. Box 426, Wheaton, IL 60187.
- B. The identification tape shall bear the printed identification of the utility line below it, such as "Caution - Buried Below". Tape shall be reverse printed; surface printing will not be acceptable. The tape shall be visible in all types and colors of soil and provide maximum color contrast to the soil. The tape shall meet the APWA color code, and shall be 2 inches in width. Colors are: yellow - gas, green - sewer, red - electric, blue - water, orange - telephone, brown - force main.
- C. The tape shall be the last equipment installed in the trench so as to be first out. The tape shall be buried 4 to 6 inches below top of grade. After trench backfilling, the tape shall be placed in the backfill and allowed to settle into place with the backfill. The tape may be plowed in after final settlement, installed with a tool during the trench backfilling process, unrolled before final restoration or installed in any other way acceptable to the Owner or Engineer.

### **3.7 PLACEMENT OF LOCATION WIRE**

- A. Detectable underground location wire shall be placed above all non-metallic water mains and force mains. Care shall be taken to insure that the buried wire is not broken.
- B. The location wire shall be no smaller than #10 AWG solid copper-coated steel wire with minimum 550 lb. tensile strength or #12 AWG stranded wire, either copper-coated steel or solid copper with minimum 300 lb. tensile strength; each with HDPE insulating jacket. Wire requirements are based on electrical resistance per 1000 foot length. Copper-coated steel wire is preferred to reduce the likelihood of vandalism theft.

- C. The location wire shall be continuous from valve box to valve box and shall be terminated (unconnected) with a wire nut and enough “loose” wire to extend 24 inches outside the valve box.

**END OF SECTION**

## **SECTION 02610**

### **WATER PIPE AND FITTINGS**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. The Contractor shall furnish all labor, material, and equipment necessary to install water main piping together with all appurtenances as shown and detailed on the Drawings and specified herein.

##### **1.2 RELATED WORK**

- A. Section 02225 - Excavating, Backfilling and Compacting for Utilities.
- B. Section 02630 - Encasement Pipe.
- C. Section 02640 - Water Valves and Gates.
- D. Section 02675 - Disinfection of Potable Water Pipe.

#### **PART 2 - PRODUCTS**

##### **2.1 DUCTILE IRON PIPE (DIP) AND FITTINGS**

- A. Ductile iron pipe (DIP) shall conform to ANSI/AWWA C150/A21.50, ANSI/AWWA C151/A21.51 Standard. The pipe shall conform to pressure class 350 minimum unless noted otherwise. All fittings and joints should be capable of accommodating pressure of not less than 250 psi.
- B. Fittings shall be ductile iron in accordance with AWWA C153 and have a body thickness and radii of curvature conforming to ANSI A21.10 or ANSI A21.53 for compact fittings and shall conform to the details and dimensions shown therein. Fittings shall have rubber gasket joints meeting the requirements of AWWA C111. Fittings shall be cement-mortar lined and bituminous coated to conform to the latest revision of ANSI/AWWA standards.
- C. Ductile iron mechanical joint fittings shall be in accordance with AWWA C153 and have a body thickness and radii of curvature conforming to ANSI A21.10 (or A21.53 for compact fittings) and have joints in accordance with ANSI/AWWA C111/A21.11. Fittings and joints shall be supplied with all accessories.
- D. Restrained joint pipe and fittings shall be a boltless system equal to "Field- Lok" restraining gaskets or "TRFLEX Joint" as manufactured by US Pipe & Foundry Company.
- E. All ductile fittings shall be rated at 250 psi water working pressure plus water hammer. Ductile iron fittings shall be ductile cast-iron grade 70-50-05 per ASTM Specification A339-55.
- F. Cement mortar lining and seal coating for pipe and fittings, where applicable shall be in accordance with ANSI/AWWA C104/A21.4. Bituminous outside coating shall be in accordance with ANSI/AWWA C151/A21.51 for pipe and ANSI/AWWA C110/A21.10 for fittings.
- G. No separate pay item has been established for fittings and no determination of the number of fittings required on the job has been made. The Contractor, during the bidding phase, shall determine the number of fittings required on the job and include the cost of the fittings and installation in the unit price for pipe.
- H. Ductile iron pipe and fittings shall be as manufactured by U.S. Pipe & Foundry Company, American Cast Iron Pipe Company, or approved equivalent.



## **2.2 POLYVINYL CHLORIDE (PVC) WATER PIPE - C.I. PIPE SIZE**

- A. This pipe shall meet the requirements of AWWA C900 for Polyvinyl Chloride (PVC) Pressure Pipe, with cast iron pipe equivalent ODs. All pipe shall be made from quality PVC resin, compounded to provide physical and mechanical properties that equal or exceed cell class 12454 as defined in ASTM D1784. Pressure classes shall be as follows, per AWWA C900-07:
  - 1. DR 25, 165 psi
  - 2. DR 18, 235 psi
- B. Provisions must be made for expansion and contraction at each joint with a rubber ring. The bell shall consist of an integral wall section with a solid cross-section rubber ring which meets the laboratory performance of ASTM D3139. The bell section shall be designed to be at least as strong as the pipe wall.
- C. Standard laying lengths shall be 20 feet  $\pm$  for all sizes. At least 85 percent of the total footage of pipe of any class and size shall be furnished in standard lengths, the remaining 15% in random lengths. Random lengths shall not be less than 10 feet long. Each standard and random length of pipe shall be tested to four times the class pressure of the pipe for a minimum of 5 seconds. The integral bell shall be tested with the pipe.
- D. Fittings for all lines 4 inches in diameter or larger shall be ductile iron and in accordance with AWWA C153 and have a body thickness and radii of curvature conforming to ANSI A21.10 or ANSI A21.53 for compact fittings. Cement mortar lining and seal coating shall be in accordance with ANSI/AWWA C104/A21.4. Bituminous outside coating shall be in accordance with ANSI/AWWA C110/A21.10. All fittings shall be rated at 250 psi water working pressure plus water hammer and be ductile cast-iron grade 70-50-05 per ASTM Specification A339.
- E. Fittings for all lines less than 4 inches in diameter shall be PVC gasketed push-on type or socket glue-type manufactured specifically for the pipe class being utilized. All socket-glue type connections shall be joined with PVC solvent cement conforming to ASTM D2564. Product and viscosity shall be as recommended by the pipe and fitting manufacturer to assure compatibility. Solvent cement joints shall be made up in accordance with the requirements of ASTM D2855. Appropriate thrust blocks shall be provided for the fittings.
- F. No separate pay item has been established for fittings and no determination of the number of fittings required on the job has been made. The Contractor during the bidding phase shall determine the number of fittings required and include the cost of the fittings and installation in the unit price for pipe.
- G. Pipe shall be as manufactured by JM Eagle or approved equivalent. Water pipe shall be blue or white in color.

## **PART 3 - EXECUTION**

### **3.1 LAYING DEPTHS**

- A. In general, water mains shall be laid with a minimum cover of 30 inches, except as otherwise indicated on the Drawings.

### **3.2 SEWER/CONTAMINANT PIPE CROSSING CONCRETE ENCASEMENT**

- A. At locations shown on the Drawings, required by the Specifications, or as directed by the Engineer, concrete encasement shall be used when the clearance between the proposed water pipe and any existing sewer or contaminant carrying pipe is 18 inches or less.

- B. Whether the proposed water pipe is above or below the existing sewer/contaminant pipe, the concrete shall fully encase the sewer/contaminant pipe and extend to the spring line of the water pipe. Encasement shall extend in each direction along the sewer/contaminant pipe until the encased sewer/contaminant pipe is 10 feet from the proposed water main, measured perpendicular to the water main.
- C. Concrete shall be 3,000 psi and shall be mixed sufficiently wet to permit it to flow between and under the pipes to form a continuous bridge. In tamping the concrete, care shall be taken not to disturb the grade or line of either pipe or damage the joints.
- D. Concrete for this Work is not a separate pay item and will be considered incidental to water pipe installation.

### 3.3 PIPE LAYING

- A. Slip Jointed and Heat-Fusion Welded Pipe:
  - 1. All pipe shall be laid with ends abutting and true to the lines and grades indicated on the plans. Pipe shall be fitted and matched so that when laid in the Work, it will provide a smooth and uniform invert. Supporting of pipe shall be as set out in Section 02225 and in no case shall the supporting of pipe on blocks be permitted.
  - 2. Before each piece of pipe is lowered into the trench, it shall be thoroughly swabbed out to ensure it is clean. Any piece of pipe or fitting which is known to be defective shall not be laid or placed in the lines. If any defective pipe or fittings shall be discovered after the pipe is laid, it shall be removed and replaced with a satisfactory pipe or fitting without additional charge. 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. Bevel can be made with hand or power tools.
  - 3. The interior of the pipe, as the Work progresses, shall be cleaned of dirt, jointing materials, and superfluous materials of every description. When laying of pipe is stopped for any reason, the exposed end of such pipe shall be closed with a plywood plug fitted so as to exclude earth or other material and precautions taken to prevent floatation of pipe by runoff into trench.
  - 4. Anchorage of Bends:
    - a. At all tees, plugs, caps and bends of 11-1/4 degrees and over, and at reducers or in fittings where changes in pipe diameter occur, movement shall be prevented by using suitable harness, thrust blocks or ballast. Thrust blocks shall be as shown on the Drawings, with sufficient volumes of concrete being provided; however, care shall be taken to leave weep holes unobstructed and allow for future tightening of all nearby joints. Unless otherwise directed by the Engineer, thrust blocks shall be placed so that pipe and fitting joints will be accessible for repair.
    - b. Bridles, harness or pipe ballasting shall meet with the approval of the Engineer. Steel rods and clamps shall be galvanized or otherwise rust-proofed or painted.
    - c. No extra pay shall be allowed for work on proper anchorage of pipe, fittings or other appurtenances. Such items shall be included in the price bid for the supported item.
  - 5. No backfilling (except for securing pipe in place) over pipe will be allowed until the Engineer has the opportunity to make an inspection of the joints, alignment and grade in the section laid, but such inspection shall not relieve the Contractor of further liability in case of defective joints, misalignment caused by backfilling and other such deficiencies that are noted later.
  - 6. All joint surfaces shall be cleaned immediately before jointing the pipe. The joint shall be lubricated in accordance with the pipe manufacturer's recommendations. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket. All pipe shall be provided with home marks to insure proper gasket seating. Details of gasket installation and joint assembly shall follow the manufacturer's direction for the joint type and material of the pipe. The resulting joints shall be watertight and flexible.
- B. Solvent Welded Pipe:

1. All rigid plastic pipe shall be cut, made up, and installed in accordance with the pipe manufacturer's recommendations. When installed exposed, the pipe shall be supported or hung in accordance with the manufacturer's recommendations.
2. Containers of solvent cement shall be completely closed except when cement is being applied to pipe components. Should the solvent cement become lumpy or thickened, it shall be discarded, and a new container opened.
3. Schedule 80 threaded adapters shall be used where necessary to connect to a threaded valve or fitting.
4. Only strap wrenches shall be used for tightening threaded plastic joints, and care shall be taken not to overtighten those joints.
5. Solvent welded pipe shall not be laid or installed when the ambient temperature is below 40 degrees F, nor above 90 degrees F when exposed to direct sunlight. Ends to be joined shall be shielded from direct sunlight prior to and during the laying operation.
6. Provide adequate ventilation when working with pipe joint solvent cement.

### 3.4 TESTING OF WATER PIPE

- A. The completed work shall comply with the provisions listed herein, or similar requirements which will ensure equal or better results. Suitable test plugs, water pump or other equipment and apparatus, and all labor required to properly conduct the tests shall be furnished by the Contractor at no expense to the Owner.
- B. Water main piping shall be pressure tested to 250 percent of the normal system operating pressure or to 100 percent of the rated working pressure of the pipe, whichever is less. At no time shall the test pressure exceed 100 percent of the pipe's rated working pressure. A pipe section shall be accepted if the test pressure does not fall more than 5 psi during the minimum 2-hour test period. The pipe shall be tested for allowable leakage according to AWWA C-600 or C-605, as applicable, concurrently with the pressure test.
- C. Where practicable, pipelines shall be tested between line valves or plugs in lengths of not more than 6,000 feet. Testing shall proceed from the source of water toward the termination of the line. The line shall be tested upon the completion of the first 6,000 feet. After the completion of two (2) consecutive tests without failure, the Contractor, at his option and with the Engineer's approval, may discontinue testing until the system is complete.
- D. All pipe, fittings and other materials found to be defective under test shall be removed and replaced at the Contractor's expense.
- E. Before applying the specified test pressure, air shall be expelled completely from the pipe, valves and hydrants. If permanent air vents are not located at high points within the test section, the Contractor shall install corporation cocks at such points so that the air can be expelled as the line is filled with water.
- F. All piping shall be tested for leakage at a pressure no less than that specified for the pressure test. The leakage shall be defined as the quantity of water that must be supplied to the tested section to maintain pressure within 5 psi of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water. The leakage shall be less than an allowable amount determined by the following equation:

$$L = \frac{SD (P)^{1/2}}{133,200}$$

- Where: L = allowable leakage (gallons/hour)  
S = length of pipe tested, in feet  
D = nominal diameter of pipe (inches)  
P = test pressure (psig)

- G. Should the sections under test fail to meet the requirements, the Contractor shall do all work of locating and repairing the leaks and retesting as the Engineer may require without additional compensation. All visible leaks are to be repaired regardless of the amount of leakage.

- H. If in the judgment of the Engineer, 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 Engineer, but in any event, the Contractor shall be responsible for the ultimate tightness of the line within the above test requirements.

**3.5 PLACEMENT OF IDENTIFICATION TAPE**

- A. The placement of detectable underground marking tape shall be installed over all water mains as specified in Section 02225.

**3.6 PLACEMENT OF LOCATION WIRE**

- A. The placement of detectable underground location wire shall be installed above all non-metallic water main as specified in Section 02225.

**END OF SECTION**

**SECTION 02630**  
**ENCASEMENT PIPE**

**PART 1 - GENERAL**

**1.1 WORK INCLUDED**

- A. The Contractor shall furnish all labor, material, and equipment necessary to install encasement pipe together with all appurtenances as shown and detailed on the Drawings and specified herein.

**1.2 RELATED WORK**

- A. Section 02225 - Excavating, Backfilling and Compacting for Utilities.
- B. Section 02610 - Water Pipe and Fittings.
- C. Section 02731 – Gravity Sewers.
- D. Section 02732 - Sewage Force Mains.

**PART 2 - PRODUCTS**

**2.1 STEEL PIPE**

- A. Steel seamless pipe shall be new Grade B steel material, with a minimum yield of 35,000 psi and a wall thickness as shown below unless otherwise required by a permitting authority. The material shall conform to the chemical and mechanical requirements of the latest revision of ASTM A139 "Electric-Fusion (ARC) - Welded Steel Pipe (NPS 4 and Over)," unless otherwise stated herein.
- B. The minimum wall thickness shall be in accordance with the following table:

**Steel Casing Pipe Wall Thickness**

<b>Casing Diameter (inches)</b>	<b>(Minimum Wall Thickness Under Railroads (inches)</b>	<b>Minimum Wall Thickness All Other Uses (inches)</b>
16 and under	0.250	0.250
18	0.281	0.250
20 and 22	0.312	0.281
24	0.344	0.312

- C. Welds of the steel casing pipe shall be solid butt-welds with a smooth non-obstructing joint inside and conform to all specifications as required by American Welding Society (AWS). The casing pipe shall be installed without bends. All welders and welding operators shall be qualified as prescribed by AWS requirements.
- D. The wall thickness at any point shall be within 12.5% inches of the nominal metal thickness specified.
- E. Hydrostatic testing shall not be necessary.
- F. A protective coating shall be applied to each length of pipe. Following an SSPC SP-7 "Brush-Off Blast Cleaning" surface preparation, 3 (dry) mils of Tnemec-Primer 10-99 (red), or Porter International Primer 260FD (red), or an equivalent thickness of an approved equivalent paint shall be applied in the manner recommended by the respective paint manufacturer.

- G. Each length of pipe shall be legibly marked, stating: manufacturer, diameter, wall thickness and primer.
- H. Precaution shall be taken to avoid deforming the pipe and damaging the primer during shipping.

**2.2 CARRIER PIPE SPACERS**

- A. Carrier pipes installed inside encasement pipes shall be centered throughout the length of encasement pipe. Centering shall be accomplished by the installation of polyethylene pipeline spacers attached to the carrier pipe in such manner as to prevent the dislodgement of the spacers as the carrier pipe is pulled or pushed through the encasement pipe. Spacers shall be of such dimensions to provide: full supportive load capacity of the pipe and contents; of such thickness to allow installation and/or removal of the pipe; and to allow no greater than 1/2 inch movement of the carrier pipe within the cover pipe after carrier pipe is installed.
- B. Spacers shall be located immediately behind each bell and at a maximum spacing distance as follows:

Carrier Pipe Diameter (inches)	Maximum Spacing (feet)
2 - 2-1/2	4
3 - 8	7
10 - 26	10

- C. The materials and spacing to be used shall be accepted by the Engineer prior to installation. The polyethylene pipeline spacers shall be manufactured by Pipeline Seal and Insulator, Inc. (PSI), Raci Spacers, Inc., or equivalent. Installation shall be in accordance with manufacturer’s recommendations.

**2.3 ENCASEMENT PIPE END SEALS**

After installation of the carrier pipe within the encasement pipe, the ends of the casing shall be sealed with either a wraparound or a pull-on casing end seals fabricated of minimum 1/8-inch thick neoprene rubber. The seals shall be attached to the encasement pipe and the carrier pipe by 304 stainless steel band clamps not less than 1/2-inch wide. The casing end seals shall be as manufactured by Advance Products & Systems, Inc., or approved equivalent.

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

- A. Where shown on the Drawings, the Contractor shall install encasement pipe. Install encasement pipe to maintain alignment, grade and the circular shape of the encasement pipe. The encasement pipe shall be straight and true in alignment; and any significant deviation from line or grade, in the opinion of the Engineer or permitting authority, shall be sufficient cause for disapproving or rejecting the installation.
- B. Two methods of installation are designated, the open-cut method and the boring method.
  - 1. The open-cut method shall consist of placing the encasement pipe in the excavated trench, then installing the carrier pipe inside the encasement pipe. Excavation, bedding and backfilling shall be in accordance with Section 02225.

2. The boring and jacking method consists of pushing or jacking the encasement pipe into the subsurface material as an auger cuts out the material or after the auger has completed the bore. Where designated on the drawings, crossings beneath state maintained roads or other surfaces not to be disturbed, shall be installed by boring and jacking of steel casing pipe followed by installation of the carrier pipe within the casing pipe. The Contractor shall provide a jacking pit, bore through the earth and/or rock, jack the casing pipe into proper line and grade and then install the carrier pipe within the casing pipe. The approach trench shall be large enough to accommodate one section of casing pipe, the jacks and blocking. The Contractor shall furnish and use adequate equipment to maintain the line and grade.
- C. The carrier pipe shall be ductile iron, polyvinyl chloride, or polyethylene pipe as designated on the Drawings. The carrier pipe shall be installed using pipe spacers as described in this Section. Carrier pipe will not be permitted to rest on bells or couplings.
- D. Following installation of the carrier pipe, the ends of the encasement pipe shall be sealed with products of the type described in this Section.

### **3.2 DAMAGE**

- A. The cost of repairing damage to the highway which is caused by a boring and jacking installation shall be borne by the Contractor.

## **END OF SECTION**

## **SECTION 02640**

### **WATER VALVES AND GATES**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. The Contractor shall furnish all labor, material, and equipment necessary to install valves together with all appurtenances as shown and detailed on the Drawings and specified herein.

##### **1.2 RELATED WORK**

- A. Section 02225 - Excavating, Backfilling and Compacting for Utilities.
- B. Section 02610 - Water Pipe and Fittings.
- C. Section 02645 - Hydrants.

##### **1.3 SUBMITTALS**

- A. Complete shop drawings of all valves and appurtenances shall be submitted to the Engineer in accordance with the requirements of Section 01300.
- B. The manufacturer shall furnish the Engineer two (2) copies of an affidavit stating that the valve and all materials used in its construction conform to the applicable requirements of the latest revision of the applicable AWWA Standard, and that all tests specified therein have been performed and that all test requirements have been met.
- C. The Engineer shall be furnished two (2) copies of an affidavit that the "Valve Protection Testing" has been done and that all test requirements have been met.
- D. The Engineer shall be furnished with two (2) copies of an affidavit that inspection, testing and rejection are in accordance with the latest revision of the applicable AWWA Standard.

#### **PART 2 - PRODUCTS**

##### **2.1 GATE VALVES**

- A. All gate valves shall be of the resilient seat type in accordance with the latest revision of AWWA C509 Standard. The valve body, bonnet and gate castings shall be ductile iron or cast iron. The valve shall have a non-rising stem (NRS), fully bronze mounted or stainless steel with o-ring seals. Valve body and bonnet, inside and out, shall be fully coated with fusion bonded epoxy coating in accordance with AWWA C550 Standard. Valves shall have a rated working pressure of 200 psi.
- B. Gate valves for buried service shall be furnished with mechanical joint end connections, unless otherwise shown on the Drawings or specified herein. The end connection shall be suitable to receive ductile iron or PVC pipe.
- C. All gate valves shall have the name or monogram of the manufacturer, the year the valve casting was made, the size of the valve, and the working pressure cast on the body of the valve.
- D. Buried service gate valves shall be provided with a 2-inch square operating nut and shall be opened by turning to the left (counterclockwise).
- E. Buried service gate valves shall be installed in a vertical position with valve box as detailed on the Drawings. They shall be set vertically and properly adjusted so that the cover will be in the same plane as the finished surface of the ground or street.



- F. Valves shall be those manufactured by Mueller, M & H Valve Company, American or approved equivalent.

## 2.2 TAPPING VALVES

- A. All tapping valves shall be of the resilient seat, gate valve type in accordance with the latest revision of AWWA C509 Standard. The valve body, bonnet and gate castings shall be cast iron. The valve shall have a non-rising stem (NRS), fully bronze mounted with o-ring seals. Valve body and bonnet, inside and out, shall be fully coated with fusion bonded epoxy coating in accordance with AWWA C550 Standard. Valves shall have a rated working pressure of 200 psi.
- B. Valve shall be furnished with ANSI B16.1 flanged end with centering ring on tapping side. Outlet side shall be mechanical joint. All valves through 12 inches shall mate all sleeves through 12-inch outlet regardless of manufacturer.
- C. All cast iron shall conform to ASTM A126, Class B. Castings shall be clean and sound without defects that will impair their service. No plugging or welding of such defects will be allowed. Bolts shall be electric-zinc plated steel with hex heads and hex nuts in accordance with ASTM A-307 and A-563.
- D. Stems shall be manganese bronze having a minimum tensile strength of 60,000 psi, a minimum yield of 20,000 psi. NRS stem collars shall be cast integral with them and machined to size. The housing for the valve stem collar shall be machined. All thrust bearing shall be incorporated as required, to optimize operating torques. NRS valves shall be furnished with two (2) o-ring stem seals located above the thrust collar and one (1) below. O-rings shall be set in grooves in the stem. The o-ring grooves shall not be less than the root diameter of the stem threads.
- E. Gates for valve shall be totally encapsulated in rubber, be field replaceable, and provide a dual seal on the mating body seat. Valve shall be capable of installation in any position with rated sealing in both directions. Rubber sets of specially compounded SBR materials shall be utilized and be capable of sealing even under conditions of normal wear. The valve body shall have integral guide engaging lugs in the gate in a tongue-and-groove manner, supporting the gate throughout the entire open/close travel.
- F. Tapping valves shall be capable of making taps by using a cutter not less than 1/4-inch smaller than nominal pipe size.
- G. All tapping valves shall have the name or monogram of the manufacturer, the year the valve casting was made, the size of the valve, and the working pressure cast on the body of the valve.
- H. Tapping valves shall be provided with a 2-inch square operating nut and shall be opened by turning to the left counterclockwise).
- I. Tapping valves shall be installed in a vertical position with valve box as detailed on the Drawings. They shall be set vertically and properly adjusted so that the cover will be in the same plane as the finished surface of the ground or street.
- J. Valves shall be those manufactured by Mueller, M & H Valve Company, American or approved equivalent.

## 2.3 TAPPING SLEEVES

- A. Tapping sleeves shall be cast iron and capable of containing pressure within the full volume of the sleeve. Sleeve shall be mechanical joint suitable for use with ductile iron or PVC pipe.
- B. Sleeve shall be rated at 200 psi working pressure through 12-inch size and 150 psi for sleeves 14-inch through 24-inch.
- C. Flanged throat section of mechanical joint sleeves through 12-inch size shall conform to MSS SP60 Standard. For throat sections larger than 12 inches, flanged section shall mate valves of same manufacture as sleeves.

- D. All cast iron shall conform to ASTM A126, Class B. Castings shall be cleaned and sound without defects that will impair their service. No plugging or welding of such defects will be allowed. Bolts, nuts, and gaskets shall be in accordance with mechanical joint requirements of AWWA C111.
- E. Tapping sleeves shall be capable of withstanding their rated pressure without leakage past the side gaskets and end gaskets of the sleeve. Sleeves shall be supplied with split end gaskets and two-piece glands. Side flange rubber gaskets shall butt against the rubber end gaskets to make a watertight seal. Side and end bolts shall be of a T-head design. The throat flange shall be designed to center the tapping valve to the sleeve. Tapping sleeve shall be equipped with a test plug.
- F. Tapping sleeves shall be fully coated with fusion bonded epoxy coating in accordance with AWWA C550 Standard.
- G. Sleeves shall be marked with the name of the manufacturer and size (run x branch).
- H. Tapping sleeve shall be manufactured by Mueller, M & H Valve Company, or approved equivalent.

#### **2.4 INSERTION VALVE SLEEVE AND VALVE ASSEMBLY**

- A. Sleeve
  - 1. Insertion valve sleeve shall provide attachment to C900 PVC pipe for drilling and final assembly of insertion valve.
  - 2. Fabricated sleeve shall assure a 360 degree seal around the pipe under working pressures up to 150 psi. It shall accommodate the equipment and fixtures necessary to drill the pipe and install the valve assembly without any interruption in water service.
  - 3. Materials shall be ASTM A-36 steel, epoxy coated to 10 to 12 mils. A special flange shall mate with the installation equipment and valve assembly. The manufacturing tolerances of the neck shall assure proper alignment, and support, of the valve assembly. The neck shall incorporate a slide gate body that provides a connecting flange and sealing surface for the slide gate housing. The slide gate body shall provide a sealing surface for the slide gate disk o-ring.
  - 4. High strength low alloy steel bolts and nuts shall meet AWWA Standard C-111. Sleeve sidebar lugs shall properly align the sleeve halves during installation, provide a bolting surface, and assure a 360 degree seal. The lugs shall prevent excessive stress on the pipe and minimize distortion of PVC pipe.
  - 5. Mat gaskets shall be made of styrene butadiene rubber (SBR) compounded for potable water service in accordance with ASTM D2000 3 BA715. The gaskets shall provide a positive 360 degree seal on the pipe and assure a tight, durable, and resilient seal.
  - 6. The sleeve shall be lined and coated with fusion bonded epoxy. Heavy gauge type 304 stainless steel armor plates shall bridge the gap between the sleeve halves.
- B. Valve Assembly
  - 1. Insertion valve assembly shall be designed to be inserted into the sleeve after the drilling procedure is performed. The valve assembly shall perform as a water control device giving an effective shutoff of the flow of water. The valve shall be installed in the open position, under pressure and under flow conditions without any interruption of water service. The valve shall give a full flow waterway after installation.
  - 2. Plug shall be constructed of urethane rubber, with a durometer of 65 Shore A. The plug shall seal on the inside diameter of the pipe and inside diameter to the drilled hole.
  - 3. Valve stem and stem nut shall be manufactured of high strength bronze. The gearbox shall provide the force necessary to compress the plug to shut off the flow of water in the pipeline.
  - 4. Gaskets shall be made of SBR rubber, compounded for potable water service in accordance with ASTM D-2000 3 BA715, with a durometer of 70 Shore A. The gasket shall act as the sealing interface between the valve flange and the sleeve flange.
  - 5. Bolts and nuts shall be Grade 3 or better alloy steel, zinc plated for corrosion protection.

- C. Insertion Sleeve and Valve Assembly shall be Romac Series 311 and 358 or approved equivalent.

## **2.5 VALVE BOXES**

- A. Each buried stop and valve shall be provided with a suitable valve box. Boxes shall be of the adjustable, telescoping, heavy-pattern type with the lower part of cast iron and the upper part of steel or cast iron. They shall be so designed and constructed as to prevent the direct transmission of traffic loads to the pipe or valve.
- B. The upper or sliding section of the box shall be provided with a flange having sufficient bearing area to prevent undue settlement. The lower section of the box shall be designed to enclose the operating nut and stuffing box of the valve and rest on the valve bonnet.
- C. The boxes shall be adjustable through at least 6 inches vertically without reduction of the lap between sections to less than 4 inches.
- D. The inside diameter of boxes for valves shall be at least 4-1/2 inches, and the lengths shall be as necessary for the depths of the valves or stops with which the boxes are to be used.
- E. Covers for valves shall be close fitting and substantially dirt-tight.
- F. The top of the cover shall be flush with the top of the box rim. An arrow and the word OPEN to indicate the direction of turning to open the valve shall be cast in the top of the valve covers.

## **2.6 COUPLING ADAPTER**

- A. The pipe couplings shall be of a gasketed, sleeve-type with diameter to properly fit the pipe. Each coupling shall consist of one (1) steel middle ring, of thickness and length specified, two (2) steel followers, two (2) rubber-compounded wedge section gaskets and sufficient track-head steel bolts to properly compress the gaskets. Field joints shall be made with this type of coupling. The middle ring and followers of the coupling shall be true circular sections free from irregularities, flat spots, or surface defects. They shall be formed from mill sections with the follower-ring section of such design as to provide confinement of the gasket. After welding, they shall be tested by cold expanding a minimum of 1 percent beyond the yield point. The coupling bolts shall be of the elliptic-neck, track-head design with rolled threads. The manufacturer shall supply information as to the recommended torque to which the bolts shall be tightened. All bolt holes in the followers shall be oval for greater strength. The gaskets of the coupling shall be composed of a crude or synthetic rubber base compounded with other products to produce a material which will not deteriorate from age, from heat, or exposure to air under normal storage conditions. It shall also possess the quality of resilience and ability to resist cold flow of the material so that the joint will remain sealed and tight indefinitely when subjected to shock, vibration, pulsation and temperature or other adjustments of the pipe line. The couplings shall be assembled on the job in a manner to insure permanently tight joints under all reasonable conditions of expansion, contraction, shifting and settlement, unavoidable variations in trench gradient, etc.
- B. Nuts and bolts shall be in accordance with AWWA C111.
- C. Couplings shall be shop primed and field painted in accordance with Division 9 (or one coat of coal tar epoxy if not specified in Division 9).
- D. Compression couplings shall be equivalent to Style 38 manufactured by Dresser.

## **2.7 FIBERGLASS LINE MARKER FOR BURIED VALVES**

- A. General:
  - 1. Design: The continuous fiberglass reinforced composite line marker shall be a single piece marker capable of simple, permanent installation by one person using a manual driving tool. The marker, upon proper installation, shall resist displacement from wind and vehicle impact forces. The marker shall be of a constant flat "T" cross-sectional design with

reinforcing support ribs incorporated longitudinally along each edge to provide sheeting protection and structural rigidity. The bottom end of the marker shall be pointed for ease of ground penetration.

2. **Material:** The marker shall be constructed of a durable, UV resistant, continuous glass fiber and marble reinforced, thermosetting composite material which is resistant to impact, ozone, and hydrocarbons within a service temperature range of -40<sup>0</sup> F to +140<sup>0</sup> F.
3. **Workmanship:** The marker shall exhibit good workmanship and shall be free of burns, discoloration, cracks, bulges or other objectionable marks which would adversely affect the marker's performance or serviceability.
4. **Marking:** Each marker shall be permanently marked "Water Line Below." The letters shall be a minimum of 2 inches in height. A black line shall be stamped horizontally across the front of the marker near the bottom to indicate proper burial depth as shown in the standard detail. The marker shall be a CRM-375 as manufactured by Carsonite International, or approved equivalent.

**B. Physical and Mechanical Requirements:**

1. **Dimensions:** The marker shall conform to the shape and overall dimensions shown in the standard detail.
2. **Mechanical Properties:** The marker shall have the minimum mechanical properties as follows:

<b>Property</b>	<b>ASTM Test Method</b>	<b>Minimum Value</b>
Ultimate Tensile Strength	D-638	50,000 psi
Ultimate Compressive Strength	D-638	45,000 psi
Specific Gravity	D-792	1.7
Weight % Glass Reinforcement	D-2584	50%
Barcol Hardness	D-2583	47

3. **Color Fastness:** The marker shall be pigmented throughout the entire cross-section so as to produce a uniform color which is an integral part of the material. Ultraviolet resistant materials shall be incorporated in the construction to inhibit fading or cracking of the delineator upon field exposure.
4. **Vehicle Impact Resistance:** The marker shall be capable of self-erecting and remain functional after being subjected to a series of ten head on impacts by a typical passenger sedan at 35 miles per hour. The marker shall retain a minimum of 60 percent of its sheeting.

**C. Reflectors:**

1. The reflector shall be of impact resistant, pressure sensitive retro-reflective sheeting which shall be subject to approval by the Engineer. The sheeting shall be of appropriate color to meet MUTCD requirements.
2. **Mounting:** The retro-reflective sheeting shall consist of a minimum of a 3-inch wide strip placed a maximum of 2 inches from the top of the post unless otherwise specified.

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

- A. Valves shall be installed as nearly as possible in the positions indicated on the Drawings consistent with conveniences 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 which do not operate easily or are otherwise defective shall be repaired or replaced at the Contractor's expense.
- 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.
- F. 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 6 feet in length.

### **3.2 PAINTING**

- A. Valves shall be factory primed and fully coated, inside and out, with fusion bonded epoxy in accordance with the latest revision of AWWA C550 Standard.

**END OF SECTION**

## **SECTION 02642**

### **SEWAGE VALVES AND GATES**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. The Contractor shall furnish and install valves and miscellaneous piping appurtenances, as indicated on the Drawings and as herein specified.
- B. Sizes and capacities not specified herein are indicated on the Drawings.

##### **1.2 RELATED WORK**

- A. Section 02225 - Excavating, Backfilling and Compacting for Utilities.
- B. Section 02732 - Sewage Force Mains.

#### **PART 2 - PRODUCTS**

##### **2.1 COMBINATION AIR VALVES (SEWAGE)**

- A. The combination air valves shall be the size appropriate to the pipe size on which they are mounted and equivalent to A.R.I. D-025 combination air valve as manufactured by A.R.I. Flow Control Accessories.
- B. The valves shall be of the type that automatically exhausts large quantities of air during the filling of a system and allows air to re-enter during draining or when a vacuum occurs. The valves shall also release small pockets of air as they may accumulate within the piping system under operating pressure. The overall height shall not exceed 21 inches. Valves shall be constructed of high strength plastic, stainless steel, and other non-corrosive materials.
- C. The valves shall be rated for not less than 150 psi operating pressure.

##### **2.2 FIBERGLASS LINE AND VALVE MARKER**

- A. General:
  - 1. Design: The continuous fiberglass reinforced composite line marker shall be a single piece marker capable of simple, permanent installation by one person using a manual driving tool. The marker, upon proper installation, shall resist displacement from wind and vehicle impact forces. The marker shall be of a constant flat "T" cross-sectional design with reinforcing support ribs incorporated longitudinally along each edge to provide sheeting protection and structural rigidity. The bottom end of the marker shall be pointed for ease of ground penetration.
  - 2. Material: The marker shall be constructed of a durable, UV resistant, continuous glass fiber and marble reinforced, thermosetting composite material which is resistant to impact, ozone, and hydrocarbons within a service temperature range of -40<sup>0</sup> F to +140<sup>0</sup> F.
  - 3. Workmanship: The marker shall exhibit good workmanship and shall be free of burns, discoloration, cracks, bulges or other objectionable marks which would adversely affect the marker's performance or serviceability.
  - 4. Marking: Each marker shall be permanently marked "Sewer Line Below." The letters shall be a minimum of 2 inches in height. A black line shall be stamped horizontally across the front of the marker near the bottom to indicate proper burial depth as shown in the standard detail. The marker shall be a CRM-375 as manufactured by Carsonite International, or approved equivalent.
- B. Physical and Mechanical Requirements:

1. Dimensions: The marker shall conform to the shape and overall dimensions shown in the standard detail.
2. Mechanical Properties: The marker shall have the minimum mechanical properties as follows:

Property	ASTM Test Method	Minimum Value
Ultimate Tensile Strength	D-638	50,000 psi
Ultimate Compressive Strength	D-638	45,000 psi
Specific Gravity	D-792	1.7
Weight % Glass Reinforcement	D-2584	50%
Barcol Hardness	D-2583	47

3. Color Fastness: The marker shall be pigmented throughout the entire cross-section so as to produce a uniform color which is an integral part of the material. Ultraviolet resistant materials shall be incorporated in the construction to inhibit fading or cracking of the delineator upon field exposure.
  4. Vehicle Impact Resistance: The marker shall be capable of self-erecting and remain functional after being subjected to a series of ten head on impacts by a typical passenger sedan at 35 miles per hour. The marker shall retain a minimum of 60 percent of its sheeting.
- C. Reflectors:
1. The reflector shall be of impact resistant, pressure sensitive retro-reflective sheeting which shall be subject to approval by the Engineer. The sheeting shall be of appropriate color to meet MUTCD requirements.
  2. Mounting: The retro-reflective sheeting shall consist of a minimum of a 3-inch wide strip placed a maximum of 2 inches from the top of the post unless otherwise specified.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Valves shall be installed as nearly as possible in the positions indicated on the Drawings consistent with conveniences of operation. 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 which do not operate easily or are otherwise defective shall be repaired or replaced at the Contractor's expense.

**END OF SECTION**

## **SECTION 02645**

### **HYDRANTS**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. The Contractor shall furnish all labor, materials, and equipment required to complete the work of installing fire hydrants with all appurtenances as shown on the Drawings and specified herein.

#### **PART 2 - PRODUCTS**

##### **2.1 FIRE HYDRANTS**

- A. Fire hydrants shall be improved AWWA compression model with 5-1/4 inch hydrant valve, two (2) 2-1/2 inch hose outlets, one (1) 4-1/2 inch pumper nozzle, national standard threads, national standard pentagon operating nut opening left. Fire hydrant shall be equipped with safety flanges designed to prevent barrel breakage when struck by a vehicle, flanged inlets and auxiliary gate valves. Fire hydrants connected to mains 4 inches and larger shall have 6-inch inlets. Fire hydrants shall be Mueller Super Centurion 200 as manufactured by Mueller Company, or approved equivalent.
- B. Each fire hydrant shall be installed with an auxiliary gate valve and valve box; valve box cover shall be marked "water" as required.
- C. Inlet cover depth shall be minimum of 30 inches and the minimum dimension from ground to centerline of lowest opening shall be 18 inches. Fire hydrants shall be supported on a poured-in-place concrete thrust block and provided with a drainage pit as indicated on Standard Detail Sheet.
- D. All fire hydrants shall be fully coated, inside and out, with fusion bonded epoxy coating in accordance with AWWA C550 Standard and color shall be as selected by the Owner.

##### **2.2 SPARE PARTS**

- A. The Owner shall be furnished with two (2) hydrant barrel wrenches, four (4) spanner wrenches and two (2) operating nut wrenches.

#### **PART 3 - EXECUTION**

##### **3.1 INSTALLATION**

- A. Fire hydrants shall be installed in accordance with the manufacturer's directions and as detailed on the Drawings.

**END OF SECTION**



## **SECTION 02660**

### **DOMESTIC WATER DISTRIBUTION CONNECTIONS**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

The Contractor shall furnish all labor and equipment necessary to install water service piping together with tapping saddle, corporation stop, ball valve curb stop and curb box as shown and detailed on the Drawings and specified herein.

##### **1.2 RELATED WORK**

- A. Section 02225 - Excavating, Backfilling and Compacting for Utilities.
- B. Section 02640 - Water Valves and Gates.
- C. Section 02675 - Disinfection of Potable Water Pipe.

#### **PART 2 - PRODUCTS**

##### **2.1 SADDLES**

Saddles shall be brass for PVC pipe equal to the Ford S70 Series or Mueller H13000 Series.

##### **2.2 CORPORATION STOP**

- A. Corporation stops to be used with copper pipe (or polyethylene service pipe in copper pipe sizes) with compression type connections, where connected into PVC pipe, shall be the same, except with compression type outlet connections. Stops shall be Mueller Model H15008, Ford F-1000, or equal.
- B. Corporation stops shall be factory tested to 150 psi to be compatible with the pipes in which they are installed.

##### **2.3 BALL VALVE CURB STOP**

Ball valve curb stops shall be furnished for flare copper on both ends, Ford Series B22 or equivalent.

##### **2.4 CURB BOX**

Curb boxes shall be Ford Arch Pattern or equivalent to fit over the ball valve curb stop.

##### **2.5 COPPER SERVICE PIPE AND FITTINGS**

- A. Copper pipe for water service piping shall be Type K, seamless, annealed tubing, meeting latest edition of ASTM Specification B-88.
- B. Pipe shall meet all applicable provisions of the Commercial Standards and shall bear the National Sanitation Foundation (NSF) seal of approval.
- C. Fittings shall be standard wrought copper meeting ANSI B16.29 and manufactured by Ford, Mueller or equal.

#### **PART 3 - EXECUTION**

##### **3.1 INSTALLATION**

- A. All service connections shall be installed in the locations shown, rigidly supported.

- B. After installation, all service connections shall be tested at least one hour at the working pressure corresponding to the class of pipe, unless a different test pressure is specified. If any joint proves to be defective, it shall be repaired to the satisfaction of the Engineer.
- C. All materials shall be carefully inspected for defects in workmanship and materials; all debris and foreign material cleaned out of valve openings, etc.; all operating mechanisms operated to check their proper functioning, and all fittings checked for tightness. All materials which do not operate easily, or are otherwise defective, shall be repaired or replaced at no additional cost to the Owner.

### **3.2 INSPECTION AND TESTING**

- A. All service connections shall be tested to demonstrate their conformance with the specified operational capabilities and any deficiencies shall be corrected, device replaced or otherwise made acceptable to the Engineer.

**END OF SECTION**

## **SECTION 02675**

### **DISINFECTION OF POTABLE WATER PIPE**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. The Contractor shall furnish all labor, material and water necessary to disinfect the potable water pipe as shown on the Drawings and specified herein.

##### **1.2 RELATED WORK**

- A. Section 02225 - Excavating, Backfilling and Compacting for Utilities.
- B. Section 02610 - Water Pipe and Fittings.
- C. Section 02640 - Water Valves and Gates
- D. Section 02660 - Domestic Water Distribution Connections

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

#### **PART 3 - PART 3 - EXECUTION**

##### **3.1 DISINFECTION OF WATER LINES**

- A. Sterilization of pipe line shall be in accordance with the American Water Works Association Specification C651-05 using liquid chlorine. The pipe line shall be disinfected by using a 50 mg/l chlorine solution for a contact period of 24 hours. At the end of the 24 hour retention period, the required residual shall be 25 ppm. Pipes shall be thoroughly flushed upon meeting the chlorine residual requirements.
- B. Before the pipes are placed in service, samples of the water must be taken by the Contractor and submitted to the public health agency for testing. No pipes shall be placed in service until the samples have been approved by the agency. The Contractor shall bear all the cost of sampling, testing, and postage.
- C. Sampling locations shall be approved by the Engineer and the public health agency having jurisdiction.
- D. A satisfactory report for the section(s) under test must be submitted to the owner and the Engineer before authorizing domestic consumption of the water.
- E. Sterilization procedures shall be continued until approved samples have been obtained.

**END OF SECTION**

## SECTION 02731 GRAVITY SEWERS

### PART 1 - GENERAL

#### 1.1 WORK INCLUDED

- A. The Contractor shall furnish all labor, material, and equipment necessary to install gravity sewer piping together with all appurtenances as shown and detailed on the Drawings and specified herein.

#### 1.2 RELATED WORK

- A. Section 02225 - Excavating, Backfilling, and Compacting for Utilities.
- B. Section 02735 - Manholes and Precast Sewage Structures.

### PART 2 - PRODUCTS

#### 2.1 PIPE AND FITTINGS

- A. Polyvinyl Chloride (PVC) Pipe:
  - 1. Solid Wall PVC Pipe (SDR 35):
    - a. PVC pipe and fittings shall conform to the requirements of ASTM Standard Specifications for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings, Designation D 3034. Pipe and fittings shall have a minimum cell classification of 12454 as defined in ASTM D-1784. All pipe shall have a pipe diameter to wall thickness ratio (SDR) of a maximum of 35.
    - b. Joints shall be push-on bell and spigot type using elastomeric ring gaskets conforming to ASTM D 3212 and F 477. The gaskets shall be securely fixed into place in the bells so that they cannot be dislodged during joint assembly. The gaskets shall be of a composition and texture which is resistant to common ingredients of sewage and industrial wastes, including oils and groundwater, and which will endure permanently under the conditions of the proposed use.
    - c. Pipe shall be furnished in lengths of not more than 13 feet. The centerline of each pipe section shall not deviate from a straight line drawn between the centers of the openings at the ends by more than 1/16 inch per foot of length.
    - d. PVC pipe shall not have a filler content greater than ten percent (10%) by weight relative to PVC resin in the compound.
    - e. PVC pipe shall be clearly marked at intervals of 5 feet or less with the manufacturer's name or trademark, nominal pipe size, PVC cell classification, the legend "Type PSM SDR 35 PVC Sewer Pipe" and the designation "ASTM D 3034", or "ASTM F-679". Fittings shall be clearly marked with the manufacturer's name or trademark, nominal size, the material designation "PVC", "PSM" and the designation "ASTM D 3034", or "ASTM F-679".
    - f. PVC pipe shall have a minimum pipe stiffness of 46 psi for each diameter when measured at 5 percent vertical ring deflection and tested in accordance with ASTM D-2412.
    - g. Five (5) copies of directions for handling and installing the pipe shall be furnished to the Contractor by the manufacturer at the first delivery of pipe to the job. PVC pipe installation shall conform to ASTM D-2321 latest revision.
    - h. Pipe shall be as manufactured by JM Eagle Corp. or equivalent.

## **PART 3 - EXECUTION**

### **3.1 PIPE LAYING**

- A. All pipe shall be laid with ends abutting and true to the lines and grades indicated on the Drawings. The pipe shall be laid straight between changes in alignment and at uniform grade between changes in grade. Pipe shall be fitted and matched so that when laid in the trench, it will provide a smooth and uniform invert. Supporting of pipe shall be as set out in Section 02225 and in no case shall the supporting of pipe on blocks be permitted.
- B. Before each piece of pipe is lowered into the trench, it shall be thoroughly swabbed out to insure its being clean. Any piece of pipe or fitting which is known to be defective shall not 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 without additional charge. 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 and beveled to match the factory bevel for insertion into gasketed joints. Bevel can be made with hand or power tools.
- C. The interior of the pipe, as the work progresses, shall be cleaned of dirt, jointing materials, and superfluous materials of every description. When laying of pipe is stopped for any reason, the exposed end of such pipe shall be closed with a plywood plug fitted into the pipe bell so as to exclude earth or other material and precautions taken to prevent flotation of pipe by runoff into trench.
- D. All pipe shall be laid starting at the lowest point and installed so that the spigot ends point in the direction of flow.

### **3.2 JOINTING**

- A. All joint surfaces shall be cleaned immediately before jointing the pipe. The bell or groove shall be lubricated in accordance with the manufacturer's recommendation. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket. All pipe shall be provided with home marks to insure proper gasket seating. Details of gasket installation and joint assembly shall follow the direction of the manufacturer's of the joint material and of the pipe. The resulting joints shall be watertight and flexible. **No solvent cement joints shall be allowed.**

### **3.3 WATER PIPE CROSSING CONCRETE ENCASEMENT**

- A. At locations shown on the Drawings, required by the Specifications, or as directed by the Engineer, concrete encasement shall be used when the clearance between the proposed sewer pipe and any existing water pipe is 18 inches or less.
- B. Whether the proposed sewer pipe is above or below the existing water pipe, the concrete shall fully encase the sewer pipe and extend to the spring line of the water pipe. Encasement shall extend in each direction along the sewer pipe until the encased sewer pipe is 10 feet from the water pipe, measured perpendicular to the water pipe.
- C. Concrete shall be 3000 psi and shall be mixed sufficiently wet to permit it to flow between and under pipes to form a continuous bridge. In tamping the concrete, care shall be taken not to disturb the grade or line of either pipe or damage the joints.
- D. Concrete for this Work is not a separate pay item and will be considered incidental to sewer pipe installation.

### **3.4 TESTING OF GRAVITY SEWER LINES**

- A. After the gravity piping system has 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 line 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.

- B. During the final inspection, the Engineer will require all flexible sanitary sewer pipe to be mandrel deflection tested after installation.
1. The mandrel (go/no-go) device shall be cylindrical in shape and constructed with nine (9) evenly spaced arms of prongs. The mandrel dimension shall be 95 percent of the flexible pipe's published ASTM average inside diameter. Allowances for pipe wall thickness tolerances of ovality (from shipment, heat, shipping loads, poor production, etc.) shall not be deducted from the ASTM average inside diameter, but shall be counted as part of the 5 percent allowance. The contact length of the mandrel's arms shall equivalent or exceed the nominal diameter of the sewer to be inspected. Critical mandrel dimensions shall carry a tolerance  $\pm 0.001$  inch.
  2. The mandrel inspection shall be conducted no earlier than 30 days after reaching final trench backfill grade provided, in the opinion of the Engineer, sufficient water densification or rainfall has occurred to thoroughly settle the soil throughout the entire trench depth. Short-term (tested 30 days after installation) deflection shall not exceed 5 percent of the pipe's average inside diameter. The mandrel shall be hand pulled by the contractor through all sewer lines. Any sections of the sewer not passing the mandrel test shall be uncovered and the Contractor shall replace and recompact the embedment backfill material to the satisfaction of the Engineer. These repaired sections shall be retested with the go/no-go mandrel until passing.
  3. The Engineer shall be responsible for approving the mandrel. Proving rings may be used to assist in this. Drawings of the mandrel with complete dimensioning shall be furnished by the Contractor to the Engineer for each diameter and type of flexible pipe.
- C. The pipe line shall be made as nearly watertight as practicable, and leakage tests and measurements shall be made. All apparatus and equipment required for testing shall be furnished by the Contractor and the cost shall be included in the unit price bid for pipe and manholes.
1. The Engineer may require the Contractor to smoke test the first section (manhole to manhole) of each size of pipe and type of joint prior to backfilling, to establish and check laying and jointing procedures. The test shall consist of smoke blown into closed-off sections of sewer under pressure and observing any smoke coming from the pipe line indicating the presence of leaks. 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 Engineer.
  2. Where the groundwater level is more than 1 foot above the top of the pipe at its upper end, the Contractor shall conduct either infiltration tests or low pressure air tests on the completed pipeline.
  3. Where the groundwater level is less than 1 foot above the top of the pipe at its upper end, the Contractor shall conduct either exfiltration tests or low pressure air tests on the completed pipeline.
- D. Low pressure air tests shall be made using equipment specifically designed and manufactured for the purpose of testing sewer lines using low pressure air. The equipment shall be provided with an air regulator valve or air safety valve so set that the internal pressure in the pipeline cannot exceed 8 psig.
1. The test shall be made on each manhole-to-manhole section of pipeline after placement of the backfill. The Engineer or his designated representative must be present to witness each satisfactory air test before it will be accepted as fulfilling the requirements of these Specifications.
  2. Pneumatic plugs shall have a sealing length equivalent to or greater than the diameter of the pipe to be tested. Pneumatic plugs shall resist internal test pressures without requiring external bracing or blocking.

3. Low pressure air passing through a single control panel, shall be introduced into the sealed line until the internal air pressure reaches 4 psig greater than the maximum pressure exerted by groundwater that may be above the invert of the pipe at the time of test. However, the internal air pressure in the sealed line shall not be allowed to exceed 8 psig. When the maximum pressure exerted by the groundwater is greater than 4 psig, the Contractor shall conduct only an infiltration test.
4. At least two minutes shall be allowed for the air pressure to stabilize in the section under test. After the stabilization period, the low-pressure air supply hose shall be quickly disconnected from control panel. The time required in minutes for the pressure in the section under test to decrease from 3.5 to 2.5 psig (greater than the maximum pressure exerted by groundwater that may be above the invert of the pipe) shall not be less than that shown in the following table:

Pipe in Diameter in Inches	Minutes
4	2.0
6	3.0
8	4.0

5. 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.
  6. Reinforced concrete pipe shall be tested in accordance with ASTM C 924 (joint testing shall be in accordance with ASTM C 1103). Test time shall be a function of pipe diameter and the length of installed line to be tested as provided in ASTM C 924.
- E. Infiltration tests shall be made after underdrains, if present, have been plugged and other groundwater drainage has been stopped such that the groundwater is permitted to return to its normal level insofar as practicable.
1. Upon completion of a section of the pipeline, the line shall be dewatered and a satisfactory test conducted to measure infiltration for at least 24 hours. The amount of infiltration, including manholes, tees and connections, shall not exceed 100 gallons per nominal inch diameter per mile of sewer per 24 hours.
- F. Exfiltration tests which subject the pipeline to an internal pressure, shall be made by plugging the pipe at the lower end and then filling the line and manholes with clean water to a height of 2 feet above the top of the sewer at its upper end. Where conditions between manholes may result in test pressures which would cause leakage at the plugs or stoppers in branches, provisions shall be made by suitable ties, braces and wedges to secure the plugs against leakage resulting from the test pressure.
1. The rate of leakage from the sewers shall be determined by measuring the amount of water required to maintain the level 2 feet above the top of the pipe.
  2. Leakage from the sewers under test shall not exceed the requirements for leakage into sewers as hereinbefore specified.
- G. The Contractor shall furnish suitable test plugs, water pumps, and appurtenances, and all labor required to properly conduct the tests. Suitable bulkheads shall be installed, as required, to permit the test of the sewer. The Contractor shall construct weirs or other means of measurements as may be necessary.
- H. Should the sections under test fail to meet the requirements, the Contractor shall do all work of locating and repairing the leaks and retesting as the Engineer may require without additional compensation.

- I. If in the judgment of the Engineer, 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 Engineer, but in any event, the Contractor shall be responsible for the ultimate tightness of the line within the above test requirements.

**END OF SECTION**



## **SECTION 02732**

### **SEWAGE FORCE MAINS**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. The Contractor shall furnish all labor, material, and equipment necessary to install force main piping together with all appurtenances as shown and detailed on the Drawings and specified herein.

##### **1.2 RELATED WORK**

- A. Section 02225 - Excavating, Backfilling, and Compacting for Utilities.
- B. Section 02630 - Encasement Pipe

#### **PART 2 - PRODUCTS**

##### **2.1 POLYVINYL CHLORIDE (PVC) FORCE MAIN PIPE**

- A. Polyvinyl chloride (PVC) pipe for force mains shall be PVC pressure rated pipe with integral bell joints with rubber O-ring seals, pressure class 200, and dimension ratio SDR 21.
- B. All PVC pipe shall conform to the latest revisions of ASTM D-1784 (PVC Compounds), ASTM D-2241 (PVC Plastic Pipe, SDR) and ASTM D-2672 (Bell - End PVC Pipe). PVC pipe shall have a minimum cell classification of 12454B or 12454C as defined in ASTM D-1784. Rubber gasketed joints shall conform to ASTM D-3139. The gaskets for the PVC pipe joint shall conform to ASTM F-477 and D-1869.
- C. Fittings for all lines 4 inches in diameter or larger shall be ductile iron and in accordance with AWWA C153 and have a body thickness and radii of curvature conforming to ANSI A21.10 or ANSI A21.53 for compact fittings. Cement mortar lining and seal coating shall be in accordance with ANSI/AWWA C104/A21.4. Bituminous outside coating shall be in accordance with ANSI/AWWA C110/A21.10. All fittings shall be rated at 250 psi water working pressure plus water hammer and be ductile cast-iron grade 70-50-05 per ASTM Specification A339.
- D. Fittings for all lines less than 4 inches in diameter shall be PVC gasketed push-on type or socket glue-type manufactured specifically for the pipe class being utilized. All socket-glue type connections shall be joined with PVC solvent cement conforming to ASTM D2564. Product and viscosity shall be as recommended by the pipe and fitting manufacturer to assure compatibility. Solvent cement joints shall be made up in accordance with the requirements of ASTM D2855. Appropriate thrust blocks shall be provided for the fittings.
- E. No separate pay item has been established for fittings and no determination of the number of fittings required on the job has been made. The Contractor during the bidding phase shall determine the number of fittings required and include the cost of the fittings and installation in the unit price for pipe.
- F. Rubber gasket joints shall provide adequate expansion to allow for a 50 degree change in temperature on one length of pipe. Lubrication for rubber connected couplings shall be water soluble, non-toxic, be non-objectionable in taste and odor and have no deteriorating affect on the PVC or rubber gaskets and shall be as supplied by the pipe manufacturer.

- G. All pipe and couplings shall bear identification markings that will remain legible during normal handling, storage and installation, which have been applied in a manner what will not reduce the strength of the pipe or the coupling or otherwise damage them. Pipe and coupling markings shall include the nominal size and OD base, material code designation, dimension ratio number, ASTM Pressure Class, ASTM designation number for this standard, manufacturer's name or trademark, seal (mark) of the testing agency that verified the suitability of the pipe material for sanitary sewer service. Each marking shall be applied at intervals of not more than 5 feet for the pipe and shall be marked on each coupling.
- H. Pipe shall be as manufactured by JM Eagle or approved equivalent. Force main pip shall be green in color.

**2.2 FIBERGLASS LINE MARKER**

**A. General:**

- 1. Design: The continuous fiberglass reinforced composite line marker shall be a single piece marker capable of simple, permanent installation by one person using a manual driving tool. The marker, upon proper installation, shall resist displacement from wind and vehicle impact forces. The marker shall be of a constant flat "T" cross-sectional design with reinforcing support ribs incorporated longitudinally along each edge to provide sheeting protection and structural rigidity. The bottom end of the marker shall be pointed for ease of ground penetration.
- 2. Material: The marker shall be constructed of a durable, UV resistant, continuous glass fiber and marble reinforced, thermosetting composite material which is resistant to impact, ozone, and hydrocarbons within a service temperature range of -40<sup>0</sup> F to +140<sup>0</sup> F.
- 3. Workmanship: The marker shall exhibit good workmanship and shall be free of burns, discoloration, cracks, bulges or other objectionable marks which would adversely affect the marker's performance or serviceability.
- 4. Marking: Each marker shall be permanently marked "Water Line Below." The letters shall be a minimum of 2 inches in height. A black line shall be stamped horizontally across the front of the marker near the bottom to indicate proper burial depth as shown in the standard detail. The marker shall be a CRM-375 as manufactured by Carsonite International, or approved equivalent.

**B. Physical and Mechanical Requirements:**

- 1. Dimensions: The marker shall conform to the shape and overall dimensions shown in the standard detail.
- 2. Mechanical Properties: The marker shall have the minimum mechanical properties as follows:

<b>Property</b>	<b>ASTM Test Method</b>	<b>Minimum Value</b>
Ultimate Tensile Strength	D-638	50,000 psi
Ultimate Compressive Strength	D-638	45,000 psi
Specific Gravity	D-792	1.7
Weight % Glass Reinforcement	D-2584	50%
Barcol Hardness	D-2583	47

- 3. Color Fastness: The marker shall be pigmented throughout the entire cross-section so as to produce a uniform color which is an integral part of the material. Ultraviolet resistant materials shall be incorporated in the construction to inhibit fading or cracking of the delineator upon field exposure.
- 4. Vehicle Impact Resistance: The marker shall be capable of self-erecting and remain functional after being subjected to a series of ten head on impacts by a typical passenger sedan at 35 miles per hour. The marker shall retain a minimum of 60 percent of its sheeting.

**C. Reflectors:**

1. The reflector shall be of impact resistant, pressure sensitive retro-reflective sheeting which shall be subject to approval by the Engineer. The sheeting shall be of appropriate color to meet MUTCD requirements.
2. Mounting: The retro-reflective sheeting shall consist of a minimum of a 3-inch wide strip placed a maximum of 2 inches from the top of the post unless otherwise specified.

### **PART 3 - EXECUTION**

#### **3.1 LAYING DEPTHS**

- A. In general, force mains shall be laid with a minimum cover of 30 inches, except as otherwise indicated on the Drawings.

#### **3.2 WATER PIPE CROSSING CONCRETE ENCASEMENT**

- A. At locations shown on the Drawings, required by the Specifications, or as directed by the Engineer, steel encasement pipe or concrete encasement shall be used when the clearance between the proposed sewage force main and any existing water pipe is 18 inches or less.
- B. Whether the proposed sewage force main is above or below the existing water pipe, if concrete encasement is utilized, the concrete encasement shall fully encase the sewer pipe and extend to the spring line of the water pipe. Concrete encasement or steel encasement pipe shall extend in each direction along the sewer pipe until the encased sewer pipe is 10 feet from the water pipe, measured perpendicular to the water pipe.
- C. Concrete shall be 3000 psi and shall be mixed sufficiently wet to permit it to flow between and under pipes to form a continuous bridge. In tamping the concrete, care shall be taken not to disturb the grade or line of either pipe or damage the joints. Steel encasement pipe shall meet the requirements of Section 02630.
- D. Concrete or Steel Encasement Pipe for this Work is not a separate pay item and will be considered incidental to sewage force main installation.

#### **3.3 PIPE LAYING**

- A. All pipe shall be laid with ends abutting and true to the lines and grades indicated on the Drawings. Pipe shall be fitted and matched so that when laid in the Work, it will provide a smooth and uniform invert. Supporting of pipe shall be as set out in Section 02225 and in no case shall the supporting of pipe on blocks be permitted.
- B. Before each piece of pipe is lowered into the trench, it shall be thoroughly swabbed out to insure it being clean. Any piece of pipe or fitting which is known to be defective shall not be laid or placed in the lines. If any defective pipe or fittings shall be discovered after the pipe is laid, it shall be removed and replaced with a satisfactory pipe or fitting without additional charge. 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. Bevel can be made with hand or power tools.
- C. The interior of the pipe, as the Work progresses, shall be cleaned of dirt, jointing materials, and superfluous materials of every description. When laying of pipe is stopped for any reason, the exposed end of such pipe shall be closed with a plywood plug fitted so as to exclude earth or other material and precautions taken to prevent floatation of pipe by runoff into trench.
- D. Anchorage of Bends:

1. At all tees, plugs, caps and bends of 11-1/4 degrees and over, and at reducers or in fittings where changes in pipe diameter occur, movement shall be prevented by using suitable harness, thrust blocks or ballast. Thrust blocks shall be as shown on the Drawings, with sufficient volumes of concrete being provided; however care shall be taken to leave weep holes unobstructed and allow for future tightening of all nearby joints. Unless otherwise directed by the Engineer, thrust blocks shall be placed so that pipe and fitting joints will be accessible for repair.
2. Bridles, harness or pipe ballasting shall meet with the approval of the Engineer. Steel rods and clamps shall be galvanized or otherwise rust-proofed or painted.
3. No extra pay shall be allowed for work on proper anchorage of pipe, fittings or other appurtenances. Such items shall be included in the price bid for the supported item.

### 3.4 JOINTING

#### A. Slip Jointed and Heat-Fusion Welded Pipe:

1. All pipe shall be laid with ends abutting and true to the lines and grades indicated on the plans. Pipe shall be fitted and matched so that when laid in the Work, it will provide a smooth and uniform invert. Supporting of pipe shall be as set out in Section 02225 and in no case shall the supporting of pipe on blocks be permitted.
  2. Before each piece of pipe is lowered into the trench, it shall be thoroughly swabbed out to insure it being clean. Any piece of pipe or fitting which is known to be defective shall not be laid or placed in the lines. If any defective pipe or fittings shall be discovered after the pipe is laid, it shall be removed and replaced with a satisfactory pipe or fitting without additional charge. 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. Bevel can be made with hand or power tools.
  3. The interior of the pipe, as the Work progresses, shall be cleaned of dirt, jointing materials, and superfluous materials of every description. When laying of pipe is stopped for any reason, the exposed end of such pipe shall be closed with a plywood plug fitted so as to exclude earth or other material and precautions taken to prevent floatation of pipe by runoff into trench.
  4. Anchorage of Bends:
    - a. At all tees, plugs, caps and bends of 11-1/4 degrees and over, and at reducers or in fittings where changes in pipe diameter occur, movement shall be prevented by using suitable harness, thrust blocks or ballast. Thrust blocks shall be as shown on the Drawings, with sufficient volumes of concrete being provided; however, care shall be taken to leave weep holes unobstructed and allow for future tightening of all nearby joints. Unless otherwise directed by the Engineer, thrust blocks shall be placed so that pipe and fitting joints will be accessible for repair.
    - b. Bridles, harness or pipe ballasting shall meet with the approval of the Engineer. Steel rods and clamps shall be galvanized or otherwise rust-proofed or painted.
    - c. No extra pay shall be allowed for work on proper anchorage of pipe, fittings or other appurtenances. Such items shall be included in the price bid for the supported item.
- B. No backfilling (except for securing pipe in place) over pipe will be allowed until the Engineer has the opportunity to make an inspection of the joints, alignment and grade in the section laid, but such inspection shall not relieve the Contractor of further liability in case of defective joints, misalignment caused by backfilling and other such deficiencies that are noted later.
- C. All joint surfaces shall be cleaned immediately before jointing the pipe. The joint shall be lubricated in accordance with the pipe manufacturer's recommendations. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket. All pipe shall be provided with home marks to insure proper gasket seating. Details of gasket installation and joint assembly shall follow the manufacturer's direction for the joint type and material of the pipe. The resulting joints shall be watertight and flexible.

#### D. Solvent Welded Pipe:

1. All rigid plastic pipe shall be cut, made up, and installed in accordance with the pipe manufacturer's recommendations. When installed exposed, the pipe shall be supported or hung in accordance with the manufacturer's recommendations.
2. Containers of solvent cement shall be completely closed except when cement is being applied to pipe components. Should the solvent cement become lumpy or thickened, it shall be discarded, and a new container opened.
3. Schedule 80 threaded adapters shall be used where necessary to connect to a threaded valve or fitting.
4. Only strap wrenches shall be used for tightening threaded plastic joints, and care shall be taken not to overtighten those joints.
5. Solvent welded pipe shall not be laid or installed when the ambient temperature is below 40 degrees F, nor above 90 degrees F when exposed to direct sunlight. Ends to be joined shall be shielded from direct sunlight prior to and during the laying operation.
6. Provide adequate ventilation when working with pipe joint solvent cement.

### 3.5 TESTING OF FORCE MAINS

- A. The completed work shall comply with the provisions listed herein, or similar requirements which will insure equal or better results. Suitable test plugs, water pump or other equipment and apparatus, and all labor required to properly conduct the tests shall be furnished by the Contractor at no expense to the Owner.
- B. Force main piping shall be pressure tested to 250 percent of the normal system operating pressure or to 100 percent of the rated pressure of the pipe, whichever is less. At no time shall the test pressure exceed 100 percent of the pipe's rated pressure. A pipe section shall be accepted if the test pressure does not fall more than 5 percent during the 4-hour period.
- C. All piping shall be tested for leakage at a pressure no less than that specified for the pressure test. The leakage shall be less than an allowable amount determined by the following equation:

$$L = \frac{ND(P)^{1/2}}{7,400}$$

Where: L = allowable leakage (gallon/hour)  
N = number of joints in length of pipeline tested  
D = nominal diameter of pipe (inches)  
P = test pressure (psig)

- D. Should the sections under test fail to meet the requirements, the Contractor shall do all work locating and repairing the leaks and retesting as the Engineer may require without additional compensation.
- E. If in the judgment of the Engineer, 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 Engineer, but in any event, the Contractor shall be responsible for the ultimate tightness of the line within the above test requirements.

### END OF SECTION

## **SECTION 02735**

### **MANHOLES AND PRECAST SEWAGE STRUCTURES**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. The Contractor shall furnish all labor, material, and equipment necessary to construct manholes for sanitary sewers, including steps, frames and covers, together with all appurtenances as shown and detailed on the Drawings and specified herein. Manhole materials shall be precast concrete as detailed on the Contract Drawings.

##### **1.2 RELATED WORK**

- A. Section 02731 - Gravity Sewers.
- B. Section 02732 - Sewage Force Mains
- C. Section 03300 – Cast-in-Place Concrete

##### **1.3 DEFINITIONS**

- A. **Standard Manhole:** Any manhole that is greater than 4 feet in depth, as measured from the invert of the manhole base at its center to the bottom of the manhole frame. A standard manhole will terminate with a manhole cone with ring and lid.
- B. **Shallow Manhole:** Any manhole that is 4 feet or less in depth, as measured in the preceding sentence. A shallow manhole will terminate in a flat top with ring and lid.
- C. **Manhole Chimney:** The cylindrical variable height portion of a manhole structure used to support and adjust the finished grade of the manhole frame. The chimney extends from the top of the cone to the base of the manhole frame.
- D. **Manhole Cone:** That portion of a manhole structure which slopes upward and inward from the barrel of the manhole to the required chimney or frame diameter.

#### **PART 2 - PRODUCTS**

##### **2.1 CONCRETE MANHOLES - GENERAL**

- A. Manholes shall conform, in shape, size, dimensions, materials, and other respects, to the details indicated on the Drawings.
  - 1. All 4-foot diameter concrete manholes shall have precast reinforced concrete developed bases. Invert channels shall be factory constructed when the base is made. Sloping invert channels shall be constructed whenever the difference between the inlet and outlet elevation is 2 feet or less. 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. Concrete Manholes with diameters greater than 4 feet shall have cast-in-place or plastic formed inverts which shall be installed after construction of the manhole.
  - 2. The concrete manhole walls (barrels and cones) shall be precast concrete sections. The top of the cone shall be built of reinforced concrete adjustment rings to permit adjustment of the frame to meet the finished surface. Minimum strength of the concrete for the precast sections shall be 4,000 psi at the time of shipment.
  - 3. The base section shall be monolithic for 4-foot diameter manholes. Manholes with a diameter of 5 feet or larger shall have a base slab.

4. Manhole frames and covers shall be the standard frame and cover as indicated on the Drawings and specified hereinafter in this Section.

B. Manholes shall be manufactured by Sherman Dixie Concrete Industries, or approved equivalent.

## **2.2 PRECAST CONCRETE SECTIONS**

A. Precast concrete sections and appurtenances shall conform to the ASTM Standard Specifications for Precast Reinforced Concrete Manhole Sections, Designation C478, latest revision, with the following exceptions and additional requirements.

1. The wall sections shall be not less than 5 inches thick.
2. Only Type II cement shall be used except as otherwise specified.

B. Joints between sections shall be made watertight through the use of rubber O-ring gaskets or rubber profile gaskets such as Forsheda 138. Gaskets shall conform to the ASTM Standard C-443, latest revision. Rope mastic or butyl mastic sealant shall not be allowed except as sealant between the cone section, any adjusting sections or rings, and the frame casting.

## **2.3 MANHOLE FRAMES AND COVERS**

A. The Contractor shall furnish all cast-iron manhole frames and covers conforming to the details shown on the Drawings, or as specified.

1. 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.
2. All castings shall be thoroughly cleaned and subject to a careful hammer inspection.
3. Castings shall be at least Class 25 conforming to the ASTM Standard Specifications for Gray Iron Casting, Designation A48, latest revision.
4. Unless otherwise specified or detailed, manhole covers shall be 22-3/4 inches in diameter, weighing not less than 350 pounds per frame and cover. Manhole covers shall set neatly in the rings, with contact edges machined for even bearing and tops flush with ring edge. They shall have sufficient corrugations to prevent slipperiness. The covers shall have two (2) pick holes about 1-1/4 inches wide and 2 inches deep with 3/8-inch undercut all around. Covers shall not be perforated.
5. All covers shall be marked in large letters "SANITARY SEWER" in the center.

B. Frames and covers shall be J.R. Hoe and Sons, Mc-350, or approved equivalent.

## **2.4 MANHOLE STEPS (CONCRETE MANHOLES)**

A. Manholes steps shall be the polypropylene plastic type reinforced with a deformed steel rod. The steps shall be of the size and configuration as shown on the Drawings. Steps shall line up over the downstream invert of the manhole. The steps shall be embedded into the manhole wall a minimum of 3-3/8 inches. Steps shall be uniformly spaced at 12-inch to 16-inch intervals.

## **2.5 PIPE CONNECTOR SYSTEM**

A. All holes for pipe connections in manhole and wetwell barrels and bases shall have a factory-installed flexible rubber pipe connector system to prevent infiltration. The pipe connector system shall conform to the latest revision of ASTM-C923.

B. For manholes of 12 feet or less in depth, without the presence of ground water, the pipe connector system shall be A-Lok Manhole Pipe Seal as manufactured by A-Lok Corporation, Trenton, NJ; Contour Seal or Kor-N-Seal as manufactured by National Pollution Control Systems, Inc., Nashua, NH; PSX as manufactured by Press-Seal Gasket Corporation, or an approved equivalent.

C. For manholes of 12 feet or greater in depth, or when ground water is present, the pipe connector system shall be A-Lok Manhole Pipe Seal as manufactured by A-Lok Corporation, Trenton, NJ, or an approved equivalent.

## 2.6 CLEANOUTS

- A. Cleanouts shall be extended to finish grade and capped with a clean-out plug in accordance with details and at locations shown on the Drawings.
  - 1. Pipe shall be the same as the gravity sewer line in which the cleanout is located.
  - 2. A 4-inch thick concrete pad, 2 feet 0-inches square, with the cleanout lid section, shall be provided around each cleanout.

## PART 3 - EXECUTION

### 3.1 FABRICATION - PRECAST SECTIONS

- A. Manholes shall contain steps accurately positioned and embedded in the concrete when the section is cast.
- B. Sections shall be cured in an enclosed curing area and shall attain a strength of 4,000 psi prior to shipment.
- C. No more than two (2) lift holes or inserts may be cast or drilled in each section.
- D. Flat slab tops shall have a minimum thickness of 6 inches and reinforcement in accordance with ASTM C478.
- E. The date of manufacture and the name or trademark of the manufacturer shall be clearly marked on the precast sections.
- F. Acceptance of the sections will be on the basis of material tests and inspection of the completed product and test cylinders if requested by the Engineer.
- G. Cones shall be precast sections of similar construction.

### 3.2 SETTING PRECAST SECTIONS

- A. Precast reinforced concrete sections shall be set so as to be vertical and with sections and steps, where required, in true alignment.
- B. Rubber gaskets shall be installed in all section joints in accordance with the manufacturer's recommendations.
- C. All holes in sections used for their handling shall be thoroughly plugged with rubber plugs made specifically for this purpose.

### 3.3 SETTING MANHOLE FRAMES AND COVERS

- A. Manhole frames shall be set with the tops conforming to the required elevations set forth hereinbefore. Frames shall be set concentric with the top of the concrete and in a full bead of butyl mastic sealant so that the space between the top of the manhole and the bottom flange of the frame shall be completely watertight.
- B. Manhole covers shall be left in place in the frames on completion of other work at the manholes.

### 3.4 ADJUSTING MANHOLE FRAMES AND COVERS TO GRADE

- A. Unless otherwise shown on the Drawings, the top of the precast concrete eccentric cone of a standard manhole or the top of the flat slab of a shallow manhole shall terminate not less than 4 inches below existing grade in an unpaved non-traffic area (except in a residential yard) and not less than 13 inches below existing grade in a paved or unpaved traffic area and in a residential yard. The frame and lid shall be adjusted to the required final grade as described hereinafter.
- B. Only clean adjusting sections shall be used. Each adjusting section shall be laid in a bead of butyl mastic sealant and shall be thoroughly bonded.



- C. When a manhole is located in an unpaved non-traffic area (other than a residential yard), the frame and cover shall be adjusted to a final elevation of 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 being lower than the invert elevation shown on the Drawings, the adjustment to the required final elevation of 3 inches to 5 inches above existing grade shall be accomplished by the use of precast concrete adjusting rings. If field changes have resulted in the completed manhole invert being higher than the invert shown on the Drawings and the top of the frame and cover being higher than 5 inches above the existing grade, then the Contractor shall substitute, at no additional cost to the Owner, a shorter barrel section on the manhole so that the frame and lid may be adjusted to the proper final elevation through the use of precast concrete adjusting rings.
- D. 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. The adjusted frame and lid shall conform to the elevation and slope of the surrounding area. If field changes have resulted in the completed manhole invert being higher than the invert shown on the Drawings and the top of the eccentric cone, when used, or the top of the flat slab, when used, being less than the height of the frame and lid below the grade of the surrounding area, then the Contractor shall substitute, at no additional cost to the Owner, a shorter barrel section on the manhole so that the frame and lid may be adjusted to the proper final elevation through the use of precast concrete adjusting rings.
- E. The Contractor shall coordinate elevations of manhole covers in paved streets with the Owner. If resurfacing of the street in which sewers are laid is expected within twelve (12) months, covers shall be set 1-1/2 inches above the existing pavement surface in anticipation of the resurfacing operations.

### 3.5 VACUUM TESTING OF MANHOLES

- A. Manholes shall be tested in accordance with ASTM 1244, after installation with all connections in place. The vacuum test method is intended to demonstrate the condition of manholes prior to backfill. It may also be used to test manholes after backfilling; however, testing should be correlated with the connector supplier.
- B. Where groundwater is present in the excavation and trenches, the Contractor shall take any necessary steps (including construction of a piezometric tube adjacent to the manhole) to determine the depth of groundwater above the invert of the manhole at the time of testing, at no additional cost to the Owner. Information concerning groundwater levels above the invert shall be used to determine the amount of vacuum applied during the test.
- C. A vacuum test for manholes **shall** include testing of the joint seal between the cast iron frame and the concrete cone, top slab, and any grade rings. Where a hatch and cover are provided in the top of a precast sewage structure, the Contractor shall provide a means of establishing a seal over the hatch, unless the Drawings and notes indicate that the hatch is to be tested for vacuum.
- D. Prior to the test, the following items shall be complete:
  - 1. Lift holes, if any, shall be plugged with an approved, non-shrink grout prior to testing.
  - 2. Drop connections, if any, shall be installed prior to testing.
- E. Testing Procedure:
  - 1. Temporarily plug, with the plugs being braced to prevent the plugs or pipes from being drawn into the manhole, all pipes entering the manhole at least eight inches into the sewer pipe(s). The plug must be inflated at a location past the manhole/pipe gasket.
  - 2. The test head shall be placed on the top of the conical, over the manway opening in a flat top, or (in the case of a wetwell or valve vault) over such adapter as may be required, and inflated in accordance with the manufacturer's recommendations.

3. A vacuum of 10 inches of mercury shall be drawn on the manhole, or such lesser amount of vacuum that the combined vacuum and positive external head pressure from groundwater does not exceed the recommended pressure ratings for the pipe connector system. The vacuum shall be measured by a test gauge which shall be liquid filled, having a 3.5 inch diameter face, reading from zero to thirty inches of mercury.
4. The indicated vacuum (as determined under the preceding paragraph) shall be drawn on the manhole, the valve on the vacuum line of the test head closed, and the vacuum pump shut off. The time shall be measured for the vacuum to drop 1 inch of mercury.
5. The manhole shall be considered to pass the vacuum test if the time for the vacuum reading to drop 1 inch of mercury meets or exceeds the values indicated in the following table:

<b>Minimum Test times for Various Manhole Diameters (seconds)</b>									
<b>Depth (ft.)</b>	<b>Diameter (inches)</b>								
	<b>30</b>	<b>33</b>	<b>36</b>	<b>42</b>	<b>48</b>	<b>54</b>	<b>60</b>	<b>66</b>	<b>72</b>
<b>8</b>	11	12	14	17	20	23	26	29	33
<b>10</b>	14	15	18	21	25	29	33	36	41
<b>12</b>	17	18	21	25	30	35	39	43	49
<b>14</b>	20	21	25	30	35	41	46	51	57
<b>16</b>	22	24	28	34	40	46	52	58	67
<b>18</b>	25	27	32	38	45	52	59	65	73
<b>20</b>	28	30	35	42	50	58	65	72	81
<b>22</b>	31	33	39	46	55	64	72	79	89
<b>24</b>	33	36	42	51	59	69	78	87	97
<b>26</b>	36	39	46	55	64	75	85	94	105
<b>28</b>	39	42	49	59	69	81	91	101	113
<b>30</b>	42	45	53	63	74	87	98	108	121

6. If a manhole fails the vacuum test, the manhole shall be repaired with a non-shrinkable grout or other suitable material based on the material of which the manhole is constructed and retested, as stated above.
7. Failure of this vacuum test shall not preclude acceptance by appropriate water infiltration or exfiltration testing, or such other means as may be accepted by the Engineer.
8. All temporary plugs and braces shall be removed after each test.

**END OF SECTION**

## **SECTION 03300**

### **CAST-IN-PLACE CONCRETE**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. Formwork.
- B. Reinforcing Steel.
- C. Expansion and Contraction Joints.
- D. Waterstops
- E. Concrete.

##### **1.2 REFERENCES**

- A. ACI 350R Environmental Engineering Concrete Structures.
- B. ACI318 - Building Code Requirements for Reinforced Concrete.
- C. ACI347 - Recommended Practice for Concrete Formwork.
- D. CRSI - Manual of Standard Practice.
- E. CRSI - Placing Reinforcing Bars.
- F. ASTM - A-615, A-120, A-185, C-31, C-39

##### **1.3 SUBMITTALS**

- A. The Contractor shall submit the following data to the Engineer for review:
  - 1. Mix designs for all mixes proposed or required to be used, including all mixes containing admixtures.
  - 2. Certification by the manufacturer that cement meets the Specification contained herein.
  - 3. Shop drawing for reinforcing steel showing bar schedules, location, and splices.
  - 4. Reports on laboratory compression tests of cylinders taken during concrete placement.
  - 5. Manufacturer's cut sheets for all other concrete related products.

#### **PART 2 - PRODUCTS**

##### **2.1 CLASSES OF CONCRETE AND USAGE**

- A. Structural concrete of the various classes required shall be proportioned to produce the following 28-day compressive strengths:
  - 1. Selection of Proportions for 4,500 psi Concrete:
    - a. 4,500 psi compressive for strength at 28 days.
    - b. Type I/II cement plus air.
    - c. Maximum water/cement ratio - 0.42.
    - d. Minimum cement content - 564 lbs. (6.0 bags)/cubic yard concrete.
    - e. Nominal maximum size coarse aggregate - No. 67 (3/4-inch maximum) or No. 57 (1-inch maximum).
    - f. Air content - 5% plus or minus 1% by volume.
    - g. Slump - 4 inches in accordance with ASTM C-143, when measured with only an air entraining admixture. Additional slump is allowed by use of water reducing or superplasticizing admixtures.

2. Selection of Proportions for 3,000 psi Concrete:
  - a. 3,000 psi compressive strength at 28 days.
  - b. Type I/II cement plus air.
  - c. Maximum water/cement ratio - 0.56.
  - d. Minimum cement content - 470 lbs. (5.0 bags)/cubic yard concrete.
  - e. Nominal maximum size coarse aggregate - No. 67 (3/4-inch maximum) or No. 57 (1-inch maximum).
  - f. Air content - 5% plus or minus 1% by volume.
  - g. Slump - 4 inches in accordance with ASTM C-143, when measured with only an air entraining admixture.
- B. Concrete shall be used as follows:
  1. 4,500 psi concrete for all concrete work except as noted below.
  2. 3,000 psi concrete for encasement of piping where indicated, and thrust blocking.
- C. All testing of aggregates and determination of proportions shall be or have been performed by a recognized independent testing laboratory.
- D. Cement for exposed concrete shall have a uniform color classification.
- E. Type I/II cement conforming to ASTM C-150 shall be used in all concrete.
- F. Coarse aggregate shall be crushed stone having clean, hard, uncoated particles, and shall be free from injurious amount of soft, friable, thin, elongated or laminated pieces. Coarse aggregates shall conform to all requirements of ASTM C-33.
- G. Fine aggregates shall be natural sand having clean, hard, uncoated grains, free from injurious amounts of clay, dust, organic matter or other deleterious substances, and shall conform to ASTM C-33.
- H. Water for concrete shall be clean, fresh, and free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances.

## **2.2 ADMIXTURES**

- A. An air entraining admixture shall be used on all concrete and shall be the neutralized vinsol resin type such as Master Builders MB-VR, Euclid Chemical Company AIR-MIX or equivalent. The admixture shall meet the requirements of ASTM C-260.
- B. Other admixtures (water reducing agents, accelerating agents, retarding agents, superplasticizing agents) shall be considered where necessary to meet the needs of construction.
- C. Admixtures shall be used in concrete design mixes in the same manner and proportions as in the field so that the effects of the admixtures are included in preliminary test submitted to the Engineer for review prior to the start of construction.

## **2.3 REINFORCEMENT**

- A. The minimum yield strength of the reinforcement shall be 60,000 pounds per square inch. Bar reinforcement shall conform to the requirements of ASTM A-615. All bar reinforcement shall be deformed.
- B. Welded wire fabric shall conform to ASTM A-185 and shall be of weight and gauge as indicated on the Drawings.
- C. Reinforcement supports and other accessories in contact with the forms for members which will be exposed to view in the finished work shall be of stainless steel or shall have approved high-density polyethylene tips so that the metal portion shall be at least one-quarter of an inch from the form or surface. Supports for reinforcement, when in contact with the ground or stone fill, shall be precast stone concrete blocks.

## 2.4 FORMS

- A. Forms shall be of suitable material, design, and construction so as to be rigid, tight enough to prevent the passage of mortar, and plane surfaces with a tolerance of 1/16-inch in 4 feet.
- B. For surfaces to be given burlap-rubbed finish, the form surface in contact with the concrete shall be made of heavy gauge metal, new plywood (used plywood which, in the opinion of the Engineer, is substantially equal to new plywood may be used), tempered wood fiberboards with smooth surface, or similar materials. Metal forms or form linings shall have square edges so that the concrete will not have fins or fluting. Forms shall not be pieced out by use of materials different from those in the adjacent form or in such manner as will detract from the uniformity of the finished surface.
- C. For surfaces other than those to be given burlap-rubbed finish, forms shall be made of wood, metal, or other acceptable material. Wooden forms shall be constructed of sound lumber or plywood of suitable dimensions, free from knotholes and loose knots. Plywood shall be reasonable good, as accepted. Metal forms shall be of an acceptable type for the work involved. Edges of forms in contact with concrete shall be flush within 1/16-inch.
- D. Form for walls, columns, or piers shall have removable panels at the bottom for cleaning, inspection, and scrubbing-in of bonding grout. Forms for thin sections (such as walls or columns) of considerable height shall be arranged with suitable openings so that the concrete can be placed in a manner that will prevent segregation and accumulations of hardened concrete on the forms or reinforcement above the fresh concrete, unless special spouts are used to place concrete, and so that construction joints can be properly keyed and treated.
- E. Forms for exposed surfaces shall be built with 3/4-inch chamfer strips attached to produce smooth, straight chamfers at all sharp edges of concrete.
- F. Form ties to be encased in concrete shall not be made of through-bolts or common wire, but shall be of a well-established type, so made and installed as to embody the following features:
  - 1. After removal of the protruding part of the tie, there shall be no metal nearer than 1 inch to the face of the concrete.
  - 2. That part of the tie which is to be removed shall be at least 1/2-inch in diameter, or if smaller, it shall be provided with a wood or metal cone 1 inch long placed against the inside of the forms. Cones shall be carefully removed from the concrete after the forms have been stripped.
  - 3. Ties which pass through walls subject to hydrostatic pressure shall be provided with acceptable water stops, such as washers, securely fastened to the ties.

## 2.5 OTHER MATERIALS

- A. Anchorage items shall be of standard manufacture and of type required to engage with the anchors to be installed therein under other sections of the Specifications and shall be subject to approval by the Engineer.
- B. Premolded expansion-joint filler strips shall conform to ASTM D-1752 and shall be 3/8-inch thick unless otherwise shown.
- C. Joint sealants shall conform to ANSI 116.1. The following joint sealants are acceptable:
  - 1. Colma by Sika Corporation.
  - 2. Hornflex by A. C. Horn, Inc.
  - 3. Sonolastic by Sonneborn Division of Contech, Inc.
- D. Grout:
  - 1. Precision-support grout shall consist of a non-shrink, ready-to-use, precision grout material; proportioned, pre-mixed and packaged at the factory; delivered to the job site to place with only the addition of water; forming, placing and curing as stipulated by the manufacturer.
  - 2. Grouts which depend upon aluminum powders, chemicals, or other agents which produce gas for expansion are not acceptable.

3. Precision-support grout shall also meet the following requirements:
  - a. Free of gas producing agents.
  - b. Free of oxidizing catalysts.
  - c. Free of inorganic accelerators, including chlorides.
- E. Construction Joint Waterstops:
  1. Polyvinylchloride (PVC) Waterstops:
    - a. Provide PVC waterstops complying with Corps of Engineers CRD-C572.
    - b. Provide serrated type with a minimum thickness of 3/8 inch by a minimum width of 6 inches may be provided in specific applications as approved by the ENGINEER.
    - c. Provide PVC waterstops as manufactured by Greenstreak Plastic Products company; Vinylex Corporation, or equivalent product.
  2. Adhesive Waterstop:
    - a. Provide pre-formed adhesive waterstop in construction joint locations where shown, or as alternative to PVC waterstop where appropriate.
    - b. The preformed waterstop shall meet or exceed all requirements of Federal Specifications SS-S-210A, "Sealing Compounds for Expansion Joints".
    - c. Provide adhesive waterstops as manufactured by Synko-Flex Products, Division of Henry Products, Inc.; or equivalent product.
  3. Hydrophilic Waterstops:
    - a. Hydrophilic waterstop may be used as an alternate to the adhesive waterstop.
    - b. Provide waterstops as manufactured by Greenstreak Plastic Products Company; Adeka, Inc.; or equivalent product.
- F. Membrane Forming Curing compound: ASTM C 309, Type I-D.
  1. Provide without fugitive dye when requested by Engineer.
- G. Epoxy Bonding Agent: Provide two-component epoxy resin bonding agent as manufactured by Sika Chemical Corporation; A.C. Horn, Incorporated; or equivalent product.
- H. Adhesive Dowels:
  1. Drilling equipment used and installation of adhesive dowels shall be in accordance with manufacturer's instructions.
  2. Assure that embedded items are protected from damage and are not filled in with concrete.
  3. Unless otherwise shown or approved by Engineer, embedment depths shall be based on a compressive strength of 2,500 psi when embedded into existing concrete.)
  4. The Contractor shall comply with the adhesive material manufacturer's installation instructions on the hole diameter. The Contractor shall properly clean out the hole utilizing a synthetic brush and compressed air to remove all loose material from the hole, prior to installing adhesive capsules or material. Proper mixing of the two-component system shall be done to the manufacturer's recommendations.
  5. Adhesive material manufacturer's representative shall observe and demonstrate the proper installation procedures for the adhesive dowels and adhesive material at no additional expense to the Owner. Each installer shall be certified in writing by the manufacturer to be qualified to install the adhesive dowels.
  6. Provide two-component dowel installation adhesive as manufactured by Hilti Corporation, or approved equivalent product.

## **PART 3 - EXECUTION**

### **3.1 FORMING**

- A. Forms shall be so constructed and placed that the resulting concrete will be of the shape, lines, dimensions and to the elevations indicated on the Drawings or specified, and exposed concrete will be substantially free from board or grain marks, poorly matched joints, and other irregularities or defects.

- B. Forms shall be sufficiently rigid to prevent displacement or sagging between supports, and so constructed that the concrete will not be damaged by their removal. The Contractor shall be entirely responsible for their adequacy.
- C. All falsework to support structural slabs, beams, girders, etc., shall be designed to safely and adequately support the concrete and forms during placement and curing. The adequacy and safety of the falsework shall be the sole responsibility of the Contractor.
- D. All forms shall be oiled with an acceptable nonstaining oil or liquid form coating before reinforcement is placed.
- E. Before form material is reused, all surfaces that are in contact with the concrete shall be thoroughly cleaned, all damaged places repaired, and all projecting nails withdrawn.
- F. Except as otherwise specifically authorized by the Engineer, forms shall not be removed until the concrete has aged for the following number of days-degrees\*:
  - 1. Beams and slabs: 500 day-degrees.
  - 2. Walls and vertical surfaces: 100 day-degrees.
  - 3. \*Day-degree: Total number of days times average daily air temperature at surface of concrete. For example, 5 days at a daily average temperature of 60 degrees F, equals 300 day-degrees.
- G. Shores under beams and slabs shall not be removed until the concrete has attained at least 60 percent of the specified compressive strength and also sufficient strength to support safely its own weight and the construction live loads upon it.

### **3.2 PLACING REINFORCEMENT**

- A. Reinforcement shall be bent cold to the dimensions and shapes shown on the Drawings and within tolerances specified in the CRSI Manual of Standard Practice.
- B. Before being placed in position, reinforcement shall be cleaned of loose mill and rust scale, dirt and other coatings that will interfere with development of proper bond.
- C. Reinforcement shall be accurately placed in positions shown on the Drawings and firmly held in place during placement and hardening of concrete by using annealed wire ties. Bars shall be tied at all intersections except where spacing is less than one foot in both directions, then alternate intersections may be tied.
- D. Distance from the forms shall be maintained by means of stays, blocks, ties, hangers or other approved supports. Blocks for holding the reinforcement from contact with the forms shall be precast mortar blocks or approved metal chairs. Layers of bars will be separated by precast mortar blocks or other equally suitable devices; the use of pebbles, pieces of broken stone or brick, metal pipe and other such blocks will not be permitted. If fabric reinforcement is shipped in rolls, it shall be straightened into flat sheets before being placed.
- E. Before any concrete is placed, the Engineer shall have inspected the placing of the steel reinforcement and given permission to deposit the concrete. Concrete placed in violation of this provision will be rejected and thereupon shall be removed.
- F. Unless otherwise specified, reinforcement shall be furnished in the full lengths indicated on the plans. Splicing of bars, except where shown on the plans, will not be permitted without the approval of the Engineer. Where splices are made, they shall be staggered insofar as possible.

### **3.3 TESTING AGGREGATES AND DETERMINING PROPORTIONS**

- A. No concrete shall be used in the work until the materials and mix design have been accepted by the Engineer.
- B. The conformity of aggregates to the Specifications hereinbefore given shall be demonstrated and determined by tests per ASTM C-33 made with representative samples of the materials to be used on the work.

- C. The actual proportions of cement, aggregates, admixtures and water necessary to produce concrete conforming to the requirements set forth herein shall be determined by making test cylinders using representative samples of the materials to be used in the work. A set of four standard 6-inch cylinders shall be made and cured per ASTM C-31. Two shall be tested at 7 days and two at 28 days per ASTM C-39. The slump shall not be less than the greatest slump expected to be used in the work.
- D. Reports on the tests and a statement of the proportions proposed for the concrete mixture, shall be submitted in triplicate to the Engineer for review as soon as possible, but not less than five days prior to the proposed beginning of the concrete work. If the Contractor furnishes in writing, similar, reliable detailed information from an acceptable source, and of date not more than four months prior to the time when concrete will be used on this project, the above requirements for laboratory test may be modified by the Engineer. Such data shall derive from mixtures containing constituents, including the admixtures where used, of the same types and from the same sources as will be used on this project.
- E. The Engineer shall have the right to make check tests of aggregates and concrete, using the same materials, and to order changes as may be necessary to meet the specified requirements.
- F. The Contractor may request permission to add water at the job site; and when the addition of water is permitted by the Engineer, the quantity added shall be the responsibility of the Contractor and in no case shall the total water per bag of cement exceed the ratio set forth herein.
- G. If concrete of the required characteristics is not being produced as the work progresses, the Engineer may order such changes in proportions or materials or both, as may be necessary to secure concrete of the specified quality. The Contractor shall make such changes at his own expense and no extra compensation will be allowed because of such changes.

### 3.4 MIXING

- A. All central-plant and rolling-stock equipment and methods shall conform to the Truck Mixer and Agitator Standards of the Truck Mixer Manufacturers' Bureau of the National Ready Mixed Concrete Association, as well as the ACI Standards for measuring, Mixing and Placing Concrete (ACI 614), and with the ASTM Standard Specification for Ready-Mixed Concrete, Designation C94, insofar as applicable.
- B. Ready-mixed concrete shall be transported to the site in watertight agitator or mixer trucks. The quantity of concrete to be mixed or delivered in any one batch shall not exceed the rated capacity of the mixer or agitator for the respective conditions as stated on the nameplates.
- C. Central-mixed concrete shall be plant-mixed a minimum of 1-1/2 minutes per batch, and then shall be truck-mixed or agitated a minimum of 8 minutes. Agitation shall begin immediately after the premixed concrete is placed in the truck and shall continue without interruption until discharge. For transit-mixed concrete the major portion of the mixing water shall be added and mixing started immediately after the truck is charged.
- D. The amount of water initially added shall be recorded on the delivery slip for the Engineer's information; no additional water shall be added, either in transit or at the site, except as directed. Mixing (at mixing speed) shall be continued for at least 10 minutes followed by agitation without interruption until discharge. Concrete shall be discharged at the site within 1-1/2 hours after water was first added to the mix, and shall be mixed at least 5 minutes after all water has been added.
- E. Concrete which has become compacted or segregated during transportation to or in the site of the work shall be satisfactorily remixed just prior to being placed in the forms.
- F. Partially hardened concrete shall not be deposited in the forms. The retempering of concrete which has partially hardened (that is, the remixing of concrete with or without additional cement, aggregate, or water) will not be permitted.



### 3.5 COMPRESSION TESTS

- A. During the progress of the work, at least one (1) set of four (4) compression test cylinders shall be made for each 50 cubic yards of concrete or major fraction thereof, and not less than one such set for each type of concrete for each day's pouring. Cylinders made in the field shall be made and cured in accordance with the ASTM Standard Method of Making and Curing Concrete Test Specimens in the Field, Designation C31, except that wherever possible molds shall be left on the cylinders until they have reached the laboratory. Testing services to satisfy the requirements of ACI shall be paid for by the Contractor at his expense. Testing lab must be approved by the Engineer.
- B. One cylinder of each set shall be broken in accordance with ASTM C-39 at seven (7) days and the other two at twenty-eight (28) days. Two copies of these test results shall be submitted to the Engineer on the same day of the tests.
- C. On evidence of these tests, any concrete that fails to meet the specified strength requirements shall be strengthened or replaced as directed by the Engineer at the Contractor's expense.

### 3.6 METALWORK IN CONCRETE

- A. All trades shall be notified, at the proper time, to install items to be embedded in concrete.
- B. All castings, inserts, conduits, and other metalwork shall be accurately built into or encased in the concrete by the Contractor as directed, and all necessary precautions shall be taken to prevent the metalwork from being displaced or deformed.
- C. Anchor bolts shall be set by means of substantial templates.

### 3.7 PLACING AND COMPACTING CONCRETE

- A. At least twenty-four (24) hours before the Contractor proposes to make any placement of concrete, he shall notify the Engineer of his intention and planned procedure. Unless otherwise permitted, the work shall be so executed that a section begun on any day shall be completed during daylight of the same day.
- B. No concrete shall be placed until the subgrade has been accepted in accordance with the requirements of Section 01400, Quality Control, nor shall it be placed on frozen subgrade or in water. Placement of concrete shall not be scheduled until the forms, , reinforcing, and preliminary work have been accepted. No concrete shall be placed until all materials to be built into the concrete have been set and have been accepted by the various trades and by the Engineer. All such materials shall be thoroughly clean and free from rust, scale, oil, or any other foreign matter.
- C. Forms and excavations shall be free from water and all dirt, debris, and foreign matter when concrete is placed. Except as otherwise directed, wood forms and embedded wood called for or allowed shall be thorough wetted just prior to placement of concrete.
- D. Concrete placed at air temperatures below 40 degrees shall have a minimum temperature of 50 degrees F. and a maximum of 70 degrees F. when placed.
- E. Concrete shall be transported from the mixer to the place of final deposit as rapidly as practicable and by methods which will prevent separation of ingredients and avoid rehandling.
- F. Chutes for conveying concrete shall be metal or metal-lined and of such size, design, and slope as to ensure a continuous flow of concrete without segregation. The slope of chutes shall be not flatter than 1 on 2 and all parts of a chute shall have approximately the same slope. The discharge end of the chute shall be provided with a baffle, or, if required, a spout; and the end of the chute or spout shall be kept as close as practicable to, but in no event more than 5 feet above the surface of the fresh concrete. When the operation is intermittent, the chute shall discharge into a hopper.

- G. In thin sections of considerable height (such as walls and columns), concrete shall be placed in such a manner as will prevent segregation and accumulations of hardened concrete on the forms or reinforcement above the mass of concrete being placed. To achieve this end, suitable hoppers, spouts with restricted outlets, etc., shall be used as required or permitted unless the forms are provided with suitable openings.
- H. Chutes, hoppers, spouts, etc., shall be thoroughly cleaned before and after each run and the water and debris shall not be discharge inside the form.
- I. For any one placement, concrete shall be deposited continuously in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause the formation of seams and planes of weakness within the section, and so as to maintain, until the completion of the unit, an approximately horizontal, plastic surface.
- J. No wooden spreaders shall be left in the concrete.
- K. During and immediately after being deposited, concrete shall be thoroughly compacted by means of suitable tools and methods, such as internal-type mechanical vibrators operating at not less than 5,000 rpm., or other tool spading, to produce the required density and quality of finish. Vibration shall be done only by experienced operators under close supervision and shall be carried on in such a manner and only long enough to produce homogeneity and optimum consolidation without permitting segregation of the solid constituents, "pumping" of air, or other objectionable results. All vibrators shall be supplemented by proper spade puddling approximately 2 to 3 inches away from forms to remove included bubbles and honeycomb. Excessive spading against the forms, causing the deposition of weak mortar at the surface, shall be avoided.
- L. The concrete shall be thoroughly rodded and tamped about embedded materials so as to secure perfect adhesion and prevent leakage. Care shall be taken to prevent the displacement of such materials during concreting.

### **3.8 BONDING CONCRETE AT CONSTRUCTION JOINTS**

- A. In order to secure full bond at construction joints, the surface of the concrete previously placed (including vertical, inclined, and substantially horizontal areas) shall be thoroughly cleaned of foreign materials and laitance, if any, and then roughened.
- B. The previously placed concrete at the joint shall be saturated with clean water and kept thoroughly wet overnight, after which all pools shall be removed. After free or glistening water disappears, the concrete shall be given a thorough coating of neat cement mixed to a suitable consistency. The coating shall be 1/8-inch thick on vertical surfaces and 1/4-inch thick on horizontal surfaces, and shall be well scrubbed in by means of stiff bristle brushes wherever possible. New concrete shall be deposited before the neat cement dries.

### **3.9 CURING AND PROTECTION**

- A. All concrete, particularly slabs and including finished surfaces, shall be treated immediately after concreting or cement finishing is completed, to provide continuous moist curing for at least seven days, regardless of the adjacent air temperature. Walls and vertical surfaces may be covered with continuously saturated burlap, or kept moist by other acceptable means. Horizontal surfaces, slab, etc., shall be ponded to a depth of 1/2-inch wherever practicable, or kept continuously wet by the use of lawn sprinklers, a complete covering of continuously saturated burlap, or by other acceptable means.
- B. For at least seven (7) days after having been placed, all concrete shall be so protected that the temperature at the surface will not fall below 45 degrees F.
  - 1. No manure, salt, or other chemicals shall be used for protection.
  - 2. Wherever practicable, finished slabs shall be protected form the direct rays of the sun to prevent checking and crazing.

### 3.10 TRIMMING AND REPAIRS

- A. The Contractor shall use suitable forms, mixture of concrete, and workmanship so that concrete surfaces, when exposed, will require no patching.
- B. As soon as the forms have been stripped and the concrete surfaces exposed, fins and other projections shall be removed, recesses left by the removal of form ties shall be filled, and surface defects which do not impair structural strength shall be repaired.
- C. Defective concrete shall be cut perpendicular to the surface until sound concrete is reached, but less than 1 inch deep. The remaining concrete shall be thoroughly roughened and cleaned. Concrete around the cavity or the form-tie recess shall be thoroughly wetted and promptly painted with a 1/16-inch brush coat of neat cement mixed to the consistency of lead paint. The hole shall then be filled with mortar.
  - 1. Mortar shall be 1:1-1/2 cement and sand mix with sufficient white cement, or fine limestone screenings in lieu of sand, to produce a surface matching the adjoining work. Cement and sand shall be from the same sources as in the parent concrete.
  - 2. For filling form-tie recesses, the mortar shall be mixed slightly damp to the touch (just short of "balling"), hammered into the recess until it is dense and an excess of paste appears on the surface, and then troweled smooth. Mortar in patches shall be applied so that after partial set it can be compressed and rubbed to produce a finish flush and uniform in texture with the adjoining work. All patches shall be warm-moist cured as above specified.
- D. The use of mortar patching as above specified shall be confined to the repair of small defects in relatively green concrete. If substantial repairs are required, the defective portions shall be cut out to sound concrete and the masonry replaced by means of a cement gun, or the masonry shall be taken down and rebuilt, all as the Engineer may decide or direct.

### 3.11 SURFACE FINISH

- A. Fins and irregularities on formed surfaces to receive no other finish shall be smoothed.
- B. The top of concrete on which other concrete or unit masonry will later be placed shall be struck off true at the surface indicated on the Drawings or as permitted by the Engineer, as the concrete is being placed. As soon thereafter as the condition of the concrete permits and before it has hardened appreciably (normally within 2 hours after being deposited), all water, scum, laitance, and loose aggregate shall be removed from the surface by means of wire or bristle brooms in such a manner as to leave the coarse aggregate slightly exposed and the surface clean.
- C. Concrete surfaces shall be finished as follows, except as otherwise required by various sections of the Specifications or shown on the Drawings.
  - 1. Wood-float finish shall be given to all top, substantially horizontal, exposed surfaces.
  - 2. Burlap-rubbed finish shall be given to all interior and exterior surfaces placed against forms which will be exposed to view on completion of the work. (Finish shall be to one foot below ground and below normal liquid surface elevations).
  - 3. All surfaces shaped without forms and over which liquids will flow shall be given a steel-trowel finish.
  - 4. Concrete surfaces to which roof insulation or roofing are to be applied shall be finished sufficiently smooth to receive the roofing material, as obtained by steel trowel or very smooth wood-float finish.

### 3.12 METHOD OF FINISHING

- A. Broomed Finish: Surfaces to be given broomed finish shall first be given a steel-trowel finish. Immediately after troweling, the surface shall be lightly brushed in one direction with a hair broom to produce a nonslip surface of uniformly good appearance.
- B. Wood-float Finish:

1. Surfaces to be given a wood-float finish shall be finished by tamping with special tools to force aggregates away from the surface, and screeding with straight edges to bring the surface to the required line.
  2. As soon after the condition of concrete permits and before it has hardened appreciably, all water, film, and foreign material which may work to the surface shall be removed. Rough finishing shall be done with straight edges and derbies. Machine floating if used, shall not be started until the surface will support the float adequately without digging in and bringing excess fines to the surface. At such time, a minimum of machine and hand floating with a wood float shall be employed to bring the finish to a true and uniform surface with no coarse aggregate visible.
  3. Under no circumstances will sprinkling with water or dusting with cement be permitted during finishing of the slab.
- C. Steel Trowel Finish: Surfaces to be given a steel-trowel finish shall first be given a wood-float finish. This shall be followed by hand troweling with steel trowels to bring the surface to a uniform, smooth, hard, impervious surface free from marks and blemishes. Troweling shall not be started until all water has disappeared from the surface. Over-troweling shall be avoided. Dusting with dry cement or other mixtures or sprinkling with water will not be permitted in finishing.
- D. Burlap Rubbed Finish:
1. Immediately after the forms have been stripped and before the concrete has changed in color, all fins and other projections shall be carefully removed by use of a hammer or other suitable means, and imperfections shall be repaired as hereinbefore specified under "Trimming and Repairs". While the surface is still damp, a thin coat of cement slurry of medium consistency shall be applied by means of bristle brushes to provide a bonding coat within pits and minor blemishes in the parent concrete; the coating of large areas of the surface with this slurry shall be avoided.
  2. Before the slurry has dried or changed color, a dry (almost crumbly) grout composed of 1 volume of cement to 1-1/2 volumes of masonry sand shall be applied. The sand shall have a fineness modulus of approximately 2.25 and comply with the gradation requirements of the ASTM Standard Specifications for Aggregate for Masonry Mortar, Designation C144-76.
  3. The grout shall be uniformly applied by means of damp (neither dripping wet nor dry) pads of burlap of convenient size (approximately 6 inches square) and shall be allowed to harden for one to two hours, depending on the weather. In hot, dry weather the surface shall be kept damp by means of a fine fog spray during the hardening period.
  4. When the grout has hardened sufficiently, but before it becomes so hard as to be difficult to remove, excess grout shall be scraped from the surface of the parent concrete by the edge of a steel trowel, without removing the grout from the imperfections. Thereafter, the surface shall be allowed to dry thoroughly and then be rubbed vigorously with burlap to remove all dried grout so that no visible film remains on the surface after the rubbing. The entire cleaning operation for any area shall be so planned that sufficient time is allowed for the grout to dry and be rubbed after it has been cut with the trowel.
  5. On the day following the grouting and burlap rubbing, the concrete surface shall again be rubbed clean with a dry burlap to remove inadvertent dust. If any built-up film remains on the parent surface, it shall be removed by being rubbed with a fine abrasive stone without breaking through the surface film of the original concrete. Such rubbing shall be light and sufficient only to remove excess material without working up a lather of mortar or changing the texture of the concrete. Following the final rubbing with burlap or abrasive stone, the surface shall be thoroughly washed with stiff bristle brushes (worked only along parallel lines) to remove extraneous materials from the surface. The surface shall then be sprayed with a fine fog spray to maintain a continually damp condition for at least three (3) days after application of the grout.
  6. When the burlap-rubbed finish has been completed, the concrete surface shall be smooth, free from discolorations and stains, and of uniformly good appearance.

**3.13 HOT WEATHER CONDITIONS**

- A. Placing of concrete under conditions of high temperature, low humidity or wind shall be done in accordance with the American Concrete Institute "Hot Weather Conditions" (latest edition).

**3.14 COLD WEATHER CONDITIONS**

- A. Cold weather concreting procedures precautions shall conform with American Concrete Institute "Cold Weather Concreting" (latest edition).

**END OF SECTION**

# Standard Sanitary Sewer Bid Item Descriptions

**S BYPASS PUMPING** This item shall include all labor, equipment, and materials needed to complete a bypass pumping and/or hauling operation for diversion of sewage during sanitary sewer construction. Examples of such operations when bypass pumping and/or hauling may be necessary is during force main tie-ins, manhole invert reconstruction, insertion of new manholes into existing mains, or other similar construction. There may be more than one bypass pumping/hauling operation on a project. This item shall be paid for each separate bypass pumping/hauling operation occurrence as called out on the plans or directed by the engineer and actually performed. There will be no separate bid items defined for length, duration, or volume of sewage pumped or hauled in each occurrence. If a bypass pumping/hauling operation is called out on the plans; but, conditions are such that the bypass pumping/hauling operation is not needed or utilized, no payment will be made under this item. The contractor shall draw his own conclusions as to what labor, equipment, and materials may be needed for each bypass pumping/hauling occurrence. The contractor should be prepared to handle the maximum volume of the sewer being bypassed, even during a storm event. This item shall not be paid separately, but shall be considered incidental, when bypass pumping and/or hauling is needed during cast-in-place-pipe (CIPP) and/or point repair operations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA).

**S CIPP LATERAL SERVICE INVESTIGATION** This item shall include all equipment, materials, labor and incidentals necessary to enter the sewer in compliance with all safety/confined space requirements and perform the identification, assessment and pre-measurement of all existing and abandoned laterals for the placement of Cured-In-Place-Pipe lining. This item shall be in payment for all lateral service investigation for all sewer segments to be lined as a part of this contract. This bid item shall include bypass pumping when required. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. Payment for this item shall be LUMP SUM (LS).

**S CIPP LATERAL REINSTATEMENT** This item is to pay for installing a Cured-In-Place-Pipe liner in service laterals and service/mainline connections to stabilize structural defects and construction inadequacies. This bid item shall include all labor, equipment, materials and incidentals necessary to perform the service lateral reinstatement in accordance with the plans and specifications. Work under this item shall include bypass pumping, sewer flow control, pre-installation cleaning, sealing connections to existing sewer main, pre- and post- construction CCTV inspection and final testing of the CIPP system. This item shall also include the "top hat" required by the specifications. All CIPP lateral reinstatements shall be paid under this item regardless of the size or length of reinstatement. No separate bid items of varying sizes or length of CIPP lateral reinstatement will be provided in the contract. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. Payment for this item shall be EACH (EA) for each CIPP lateral reinstatement complete and ready for use.

**S CIPP LINER** This bid Item is to pay for rehabilitation of existing sanitary sewers using the Cured-In-Place-Pipe method. This bid item description applies to all CIPP sizes included in the contract.

All CIPP Liner items of all varying sizes shall include all labor, materials, customer notification, testing, necessary permits, ingress and egress procedures, bypass pumping, pre-construction video, sediment and root removal, dewatering, traffic control, erosion and sediment control, excavation pits, removal and replacement of manhole frames and covers as necessary to facilitate the lining work, sealing at manholes and service connections, clearing and grubbing, pipeline cleaning, re-cleaning and video inspection as many times as necessary, debris collection and disposal, root removal, pre- and post-construction video inspection, all digital inspection footage, final report preparation and approval, the cost of potable water from the Owner, required compliance tests, site restoration, site cleanup, sealing of liner at manholes, acceptance testing and all other rehabilitation work and incidentals not included under other pay items necessary to complete the rehabilitation per the plans and specifications. There will be no separate payment for acceptance testing of the lined pipe; but shall be considered incidental to this item. Pay under this item shall be by each size bid in the contract. Pay measurement shall be from center of manhole to center of manhole. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

**S CIPP PROTRUDING LATERAL REMOVAL** This item includes all equipment, materials, labor and incidentals necessary to enter the sewer in compliance with all safety/confined space requirements, remove a sufficient amount of the protruding tap to insure a proper and safe Cured-In-Place-Pipe lining insertion and perform pre-installation CCTV. This bid item shall include bypass pumping when required. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. Payment for this item shall be EACH (EA) for each protruding lateral removed.

**S CONCRETE PIPE ANCHOR** This item shall be constructed on the sewer pipe at the locations shown on the plans in accordance with sanitary sewer specifications and standard drawings. Payment for concrete anchors will be made at the contract unit price each in place complete and ready for use. Each concrete anchor of sewer pipe or force main shall be paid under one bid item per contract regardless of the sizes of carrier pipe being anchored in the contract. No separate bid items will be established for size variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S DIRECTIONAL BORE** Payment under this item is made whenever the plans or specifications specifically show directional boring is to be utilized in order to minimize the impact of open cut for the installation of force main or gravity sewer under streets, creeks, and etc. Payment under this item shall include the specified bore pipe, labor, and equipment. No separate payment shall be made for bore pipe installed in the bore whether used as a carrier pipe or an encasement of a separate carrier pipe. This item shall also include pipe anchors at each end of the bore when specified to prevent the creep or contraction of the bore pipe. Carrier pipe installed within a bore pipe shall be paid separately under pipe items. Payment under this item shall not be size specific and no separate bid items will be established for size variations. The bore pipe sizes to be included under this item shall be as shown on the plans and/or in the specifications. Any and all directional bores in each contract shall be paid under one directional bore bid item included in the contract regardless of size. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

**S ENCASEMENT CONCRETE** Includes all labor, equipment, excavation, concrete, reinforcing

steel, backfill, restoration, and etc., to construct the concrete encasement of the sewer or force main as shown on the plans, and in accordance with the specifications and standard drawings. Payment under this item shall be in addition to the carrier pipe as paid under separate bid items. Carrier pipe is not included in this bid item. Any and all concrete encasement shall be paid under one bid item included in the contract regardless of the size of the carrier pipe or the volume of concrete or steel reinforcement as specified in the plans and specifications. No separate bid items will be established for size variations. Measurement of pay quantity shall be from end of concrete to end of concrete. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

**S ENCASEMENT STEEL BORED** This item shall include the steel encasement pipe size as specified on the plans and in the specifications, casing spacers, end seals, labor, and equipment to bore and install the encasement in accordance with the plans and specifications, complete and ready for use. The size shall be the measured internal diameter of the encasement pipe. The sizes of encasement to be paid under the size ranges specified in the bid items shall be as follows:

- Range 1 = All encasement sizes greater than 2 inches to and including 6 inches
- Range 2 = All encasement sizes greater than 6 inches to and including 10 inches
- Range 3 = All encasement sizes greater than 10 inches to and including 14 inches
- Range 4 = All encasement sizes greater than 14 inches to and including 18 inches
- Range 5 = All encasement sizes greater than 18 inches to and including 24 inches
- Range 6 = All encasement sizes greater than 24 inches

*(Encasement sizes of 2 inches internal diameter or less shall not be paid separately; but, shall be considered incidental to the carrier pipe.)* Payment under this bid item shall not include the carrier pipe. Carrier pipe shall be paid under a separate bid item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

**S ENCASEMENT STEEL OPEN CUT** This item shall include the steel encasement pipe size as specified on the plans and in the specifications, casing spacers, end seals, labor, and equipment to open cut install the encasement in accordance with the plans and specifications, complete and ready for use. The size shall be the measured internal diameter of the encasement pipe. The size encasement to be paid under the size ranges specified in the bid items shall be as follows:

- Range 1 = All encasement sizes greater than 2 inches to and including 6 inches
- Range 2 = All encasement sizes greater than 6 inches to and including 10 inches
- Range 3 = All encasement sizes greater than 10 inches to and including 14 inches
- Range 4 = All encasement sizes greater than 14 inches to and including 18 inches
- Range 5 = All encasement sizes greater than 18 inches to and including 24 inches
- Range 6 = All encasement sizes greater than 24 inches

*(Encasement sizes of 2 inches internal diameter or less shall not be paid separately; but, shall be considered incidental to the carrier pipe.)* Payment under this bid item shall not include the carrier pipe. Carrier pipe shall be paid under a separate bid item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).



**S FORCE MAIN** This description shall apply to all PVC and ductile iron and polyethylene/plastic pipe bid items of every size and type, except those bid items defined as “Special”. This item includes the pipe specified by the plans and specifications, all fittings (including, but not limited to, bends, tees, reducers, plugs, and caps), tracing wire with test boxes (if required by specification), polyethylene wrap (when specified), labor, equipment, excavation, bedding, restoration, testing, backfill, and etc., required to install the specified new pipe and new fittings at the locations shown on the plans, or as directed, in accordance with the specifications and standard drawings complete and ready for use. No additional payment will be made for rock excavation. This bid item includes material and placement of flowable fill under existing and proposed pavement, and wherever else specified on the plans or in the specifications. This item shall also include pipe anchors on polyethylene pipe runs as shown on the plans or required by the specifications to prevent the creep or contraction of the pipe. Measurement of quantities under this item shall be through fittings, encasements, and directional bores (only when a separate carrier pipe is specified within the directional bore pipe). No separate payment will be made under pipe items when the directional bore pipe is the carrier pipe. Measurements shall be further defined to be to the center of tie-in where new pipe contacts existing pipe at the center of connecting fittings, to the outside face of vault or structure walls, or to the point of main termination at dead ends. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

**S FORCE MAIN AIR RLS/VAC VLV** This bid item description shall apply to all force main air release/vacuum valve installations of every size except those defined as “Special”. This item shall include the air release/vacuum valve, main to valve connecting line or piping, manhole/vault/structure, access casting or doors, tapping the main, labor, equipment, excavation, proper backfill and restoration required to install the air release/vacuum valve at the location shown on the plans or as directed in accordance with the specifications and standard drawings complete and ready for use. All air release/vacuum valves on a project shall be paid under one bid item regardless of size. No separate pay items will be established for size variations. Only in the case of the uniqueness of a particular air release/vacuum valve would a separate bid item be established. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S FORCE MAIN DIRECTIONAL BORE** Payment under this item is made whenever the plans or specifications specifically show directional boring is to be utilized in order to minimize the impact of open cut for the installation of sewer or force main under streets, buildings, creeks, and etc. Payment under this item shall include the specified bore pipe, labor, and equipment. No separate payment shall be made for bore pipe installed in the bore whether used as a carrier pipe or an encasement of a separate carrier pipe. This item shall also include pipe anchors at each end of the bore when specified to prevent the creep or contraction of the bore pipe. Carrier pipe installed within a bore pipe shall be paid separately under pipe items. Payment under this item shall not be size specific and no separate bid items will be established for size variations. The bore pipe sizes to be included under this item shall be as shown on the plans and/or in the specifications. Any and all directional bores in each contract shall be paid under one directional bore bid item included in the contract regardless of size. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

**S FORCE MAIN POINT RELOCATE** This item is intended for payment for horizontal and/or vertical relocation of a short length of an existing main at the locations shown on the plans. This bid item is to be used to relocate an existing force main at point locations such as to clear a conflict at a

proposed drainage structure, pipe or any other similar short relocation situation, and where the existing pipe material is to be reused. The contractor shall provide any additional pipe or fitting material needed to complete the work as shown on the plans and specifications. The materials provided shall be of the same type and specification as those that exist. Substitution of alternative materials shall be approved by the engineer in advance on a case by case basis. New polyethylene wrap is to be provided (if wrap exists or is specified in the specifications to be used). If it is necessary that the pipe be disassembled for relay, payment under this item shall also include replacement of joint gaskets as needed. Bedding and backfill shall be provided and performed the same as with any other pipe installation as detailed in the plans and specifications. Payment under this item shall be for each location requiring an existing main to be relocated horizontally or vertically regardless of pipe size or relocation length. No separate pay items will be established for pipe size variations or relocation segment length variations. Force Main Relocate shall not be paid on a linear feet basis; but shall be shall be paid EACH (EA) at each location when complete and placed in service. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced.

**S FORCE MAIN TAP SLEVE/VALVE RANGE 1 OR 2** This item shall include the specified tapping sleeve, valve, valve box, concrete pad around valve box (when required in specifications or plans), labor, and equipment to install the specified tapping sleeve and valve, complete and ready for use in accordance with the plans and specifications. The size shall be the measured internal diameter of the live pipe to be tapped. The size tapping sleeve and valve to be paid under sizes 1 or 2 shall be as follows:

- Range 1 = All live tapped main sizes up to and including 8 inches
- Range 2 = All live tapped main sizes greater than 8 inches

Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S FORCE MAIN TIE-IN** This bid description shall be used for all force main tie-in bid items of every size except those defined as "Special". This item includes all labor, equipment, excavation, fittings, sleeves, reducers, couplings, blocking, anchoring, restoration, testing and backfill required to make the force main tie-in as shown on the plans and in accordance with the specifications complete and ready for use. This bid item shall include purge and sanitary disposal of any sewage from any abandoned segments of force main. Pipe for tie-ins shall be paid under separate bid items. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S FORCE MAIN VALVE** This description shall apply to all force main valves of every size required in the plans and specifications, except those bid items defined as "Special". Payment under this description is to be for gate or butterfly force main valves being installed with new force main. This item includes the valve as specified in the plans and specifications, polyethylene wrap (if required by specification), labor, equipment, excavation, anchoring (if any), valve box and valve stem extensions, backfill, concrete pad around valve box (if required by specification), restoration, testing, and etc., required to install the specified valve at the location shown on the plans in accordance with the specifications and standard drawings complete and ready for use. If required on plans and/or proposed adjoining DIP is restrained, force main valves shall be restrained. Force main valve restraint shall be considered incidental to the force main valve and adjoining pipe. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be

referenced. This item shall be paid EACH (EA) when complete.

**S FORCE MAIN VALVE BOX ADJUST** Includes all labor, equipment, valve box and valve stem extensions (if required), excavation, backfill, concrete pad around valve box (when specified in specifications or plans), restoration, and etc., to adjust the top of the force main valve box to finished grade complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S LATERAL CLEANOUT** This item shall be for payment for installation of a cleanout in a service lateral line. This item shall include furnishing and installation of a tee, vertical pipe of whatever length required, and threaded cap. The cleanout shall extend from the lateral to final grade elevation. The size of the cleanout shall be equivalent to the size of the lateral. The cleanout materials shall meet the same specification as those for the lateral. The cleanout shall be installed at the locations shown on the plans or as directed by the engineer. Only one pay item shall be established for cleanout installation. No separate pay items shall be established for size or height variances. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S LATERAL LOCATE** This bid item is to pay for all labor, equipment, and materials needed in locating an existing sanitary sewer service lateral for tie-in of the lateral to new mainline sewers and/or for the relocation of a lateral. This bid item shall be inclusive of any and all methods and efforts required to locate the lateral for tie-in or relocation of the lateral. Locating methods to be included under this items shall include, but are not limited to, those efforts employing the use of video cameras from within an existing sanitary sewer main or lateral, electronic locating beacons and/or tracers inserted into the sanitary sewer main or lateral, careful excavation as a separate operation from mainline sewer or lateral excavation, the use of dyes to trace the flow of a lateral, or any combination of methods required to accurately locate the lateral. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA).

**S LATERAL LONG SIDE** This bid item description shall apply to all service lateral installations of every size up to and including 6 inch internal diameter, except those lateral bid items defined as "Special". This item includes the specified piping material, main tap, bends, clean outs, labor, equipment, excavation, backfill, testing, and restoration, at the locations shown on the plans or as directed, in accordance with the specifications and standard drawings, complete and ready for use. This bid item is to pay for service lateral installations where the ends of the lateral connection are on opposite sides of the public roadway. The new lateral must cross the centerline of the public roadway to qualify for payment as a long side lateral. The length of the service lateral is not to be specified. Payment under this item shall not be restricted by a minimum or maximum length. The contractor shall draw his own conclusions as to the length of piping that may be needed. Payment under this item shall include boring, jacking, or excavating across the public roadway for placement. Placement of a service lateral across a private residential or commercial entrance alone shall not be reason to make payment under this item. Private or commercial entrances shall not be considered a public roadway in defining payment under this item. No additional payment will be made for rock excavation or for bedding required in rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S LATERAL SHORT SIDE** This bid item description shall apply to all service lateral installations of every size up to and including 6 inch, except those lateral bid items defined as “Special”. This item includes the specified piping material, main tap tee, bends, clean outs, labor, equipment, excavation, backfill, testing, and restoration, at the locations shown on the plans or as directed, in accordance with the specifications and standard drawings, complete and ready for use. This bid item is to pay for lateral installations where both ends of the lateral connection are on the same side of the public roadway, or when an existing lateral crossing a public roadway will remain and is being extended, reconnected, or relocated with all work on one side of the public roadway centerline as shown on the plans. The length of the service lateral is not to be specified and shall not be restricted to any minimum or maximum length. Payment shall be made under this item even if the lateral crosses a private residential or commercial entrance; but, not a public roadway. Private or commercial entrances shall not be considered a public roadway in defining payment under this item. The contractor shall draw his own conclusions as to the length of piping that may be needed. No additional payment will be made for rock excavation or for bedding required in rock excavation. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S LINE MARKER** This item is for payment for furnishing and installing a sewer utility line marker as specified by the utility owner specifications and plans. A line marker may consist of a post or monument of whatever materials specified and shall include markings and/or signage on same as specified by plans or specifications. This item shall include all labor, equipment, and materials needed for complete installation of the marker. This item shall be paid EACH (EA) when complete.

**S MANHOLE** Payment under this item is for the installation of new 4 foot interior diameter sanitary sewer manhole. Payment for manholes will be made at the contract unit price each in place complete and ready for use at the locations shown on plans in accordance with specifications and standard drawings. Manholes shall include concrete base, barrel sections, cone section or slab top, steps, excavation, backfilling, air testing, restoration, and cleanup in accordance with the specifications and standard drawings. Payment shall be made under this item regardless of whether the base is to be precast or cast-in-place (doghouse). All materials, except casting, shall be new and unused. An existing casting from an existing abandoned or removed manhole is to be reused and shall be considered incidental to this item. When a new casting is specified, or an existing casting is unavailable, it shall be paid as a separate bid item. Anchoring of casting, new or used, shall be considered incidental to this bid item. No additional compensation will be paid for manhole height variations. No additional payment will be made for rock excavation. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S MANHOLE ABANDON/REMOVE** Payment under this item is for the partial removal and/or filling of any sanitary sewer manhole regardless of size or depth that no longer serves any purpose. Payment shall be made regardless of whether the manhole is or is not in conflict with other work. Any manhole requiring partial removal, but not total removal, in order to clear a conflict with other work shall be paid under this item. All manholes partially removed shall be removed to a point at least one foot below final grade, one foot below roadway subgrade, or one foot clear of any other underground infrastructure, whichever is lowest. If partial removal of an abandoned manhole is elected by the contractor, the remaining manhole structure shall be refilled with flowable fill. Payment for disposal of a sanitary sewer manhole will be made under this item only. Please refer to the Utility Company’s

Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S MANHOLE ADJUST TO GRADE** Payment under this item is for the adjustment of sanitary sewer casting elevation on all sizes of existing sanitary manholes. This work shall be performed in accordance with the sanitary sewer specifications. Payment shall be made under this bid item regardless of the amount of adjustment necessary to a sanitary sewer manhole casting or diameter of the manhole. Work under this pay item may be as simple as placing a bed of mortar under a casting; but, shall also be inclusive of installation of adjusting rings, and /or addition, removal, or replacement of barrel sections. The existing casting is to be reused unless a new casting is specified on the plans. New casting, when specified, shall be paid as a separate bid item. Anchoring of the casting shall be incidental to this item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S MANHOLE CASTING STANDARD** Payment under this bid items is for furnishing of a new standard traffic baring casting for sanitary manholes meeting the requirements of the sanitary sewer specifications and standard drawings. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when installed.

**S MANHOLE CASTING WATERTIGHT** Payment under this bid item is for furnishing of a new watertight traffic baring casting for sanitary manholes meeting the requirements of the sanitary sewer specifications and standard drawings. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when installed.

**S MANHOLE RECONSTRUCT INVERT** This bid item is to pay for all labor, equipment, and material for rework of the manhole bench to redirect or eliminate flow, such as when the flow of a pipe or pipes are being removed or redirected. This work will be as specified in the plans, specifications, or directed by the engineer. This work may consist of, but is not limited to, removal of concrete and/or placement of concrete in elimination or redirect of flow. This item shall also include providing and placement of a rubber seal or boot as required by utility specification, standard drawing or plan. The contractor shall draw his own conclusions as to the effort and scope of work needed to comply with the specifications, standard drawings, and plans. No payment shall be made under this bid when MANHOLE TAP EXISTING, or MANHOLE TAP EXISTING ADD DROP are being paid at the same location, as this type of work is included in those items. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S MANHOLE TAP EXISTING** This bid item is to pay for all labor, equipment, and material for coring one opening in an existing manhole base, addition of a rubber seal as specified, and rework of the manhole bench to direct the additional pipe flow. The bid item shall be paid for each core opening added to a single manhole. This bid item shall also include any rework of the existing manhole bench due to the elimination of other existing pipes and flow. This work will be as specified in the plans, specifications, or directed by the engineer. This work may consist of, but is not limited to, removal of concrete and/or placement of concrete in the addition, elimination, or redirect of flow. The contractor shall draw his own conclusions as to the effort and scope of work needed to comply with the

specifications, standard drawings, and plans. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S MANHOLE TAP EXISTING ADD DROP** This bid item is to pay for all labor, equipment, and material for coring one opening in an existing manhole base, addition of a rubber seal as specified, addition of a vertical drop pipe to the outside of the manhole, placement of reinforcing steel and concrete to encase vertical pipe, and rework of the manhole bench to direct the additional pipe flow. The bid item shall be paid for each drop added to a single manhole. This bid item shall also include any rework of the existing manhole bench due to the elimination of other existing pipes and flow. This work will be as specified in the plans, specifications, or directed by the engineer. This work may consist of, but is not limited to, removal of concrete and/or placement of concrete in the addition, elimination, or redirect of flow. The contractor shall draw his own conclusions as to the effort and scope of work needed to comply with the specifications, standard drawings, and plans. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S MANHOLE WITH DROP** Payment under this item is for the installation of new 4 foot interior diameter sanitary sewer manhole with drop. Payment for drop manholes will be made at the contract unit price each in place complete and ready for use at the locations shown on plans in accordance with specifications and standard drawings. Drop manholes shall include concrete base, barrel sections, drop materials, cone section or slab top, steps, excavation, backfilling, air testing, restoration, and cleanup. Payment shall be made under this item regardless of whether the base is to be precast or cast-in-place (doghouse). All materials, except casting, shall be new and unused. An existing casting from an existing abandoned or removed manhole is to be reused and shall be considered incidental to this item. When a new casting is specified, or an existing casting is unavailable, it shall be paid as a separate bid item. Anchoring of casting, new or used, shall be considered incidental to this bid item. No additional compensation will be paid for manhole height variations. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S MANHOLE WITH LINING** Payment under this item is for the installation of new 4 foot interior diameter sanitary sewer manhole with corrosion resistant lining. Payment for manholes will be made at the contract unit price each in place complete and ready for use at the locations shown on plans in accordance with specifications and standard drawings. Manholes shall include concrete base, barrel sections, cone section or slab top, steps, lining, excavation, backfilling, air testing, restoration, and cleanup in accordance with the standard drawings. Payment shall be made under this item regardless of whether the base is to be precast or cast-in-place (doghouse). All materials, except casting, shall be new and unused. An existing casting from an existing abandoned or removed manhole is to be reused and shall be considered incidental to this item. When a new casting is specified, or an existing casting is unavailable, it shall be paid as a separate bid item. Anchoring of casting, new or used, shall be considered incidental to this bid item. No additional compensation will be paid for manhole height variations. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S MANHOLE WITH TRAP** Payment under this item is for the installation of a new manhole with

trap. Payment for trap manholes will be made at the contract unit price each in place complete and ready for use at the locations shown on plans in accordance with specifications and standard drawings. Trap manholes shall include concrete base, manhole structure and trap materials, cone section or slab top, steps, excavation, backfilling, air testing, restoration, and cleanup. All materials, except casting, shall be new and unused. Payment shall be made under this item regardless of whether the base is to be precast or cast-in-place (doghouse). An existing casting from an existing abandoned or removed manhole is to be reused and shall be considered incidental to this item. When a new casting is specified, or an existing casting is unavailable, it shall be paid as a separate bid item. Anchoring of casting, new or used, shall be considered incidental to this bid item. No additional compensation will be paid for manhole height variations. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S PIPE** This description shall apply to all PVC and ductile iron gravity sewer pipe bid items of every size and type 8 inches internal diameter and larger, except those bid items defined as "Special". This item includes the pipe specified by the plans and specifications, all fittings (including, but not limited to, tap tees and couplings for joining to existing similar or dissimilar pipes), polyethylene wrap (if required by specification), labor, equipment, excavation, bedding, restoration, pressure or vacuum testing, temporary testing materials, video inspection, backfill, and etc., required to install the specified new pipe and new fittings at the locations shown on the plans, or as directed, in accordance with the specifications and standard drawings complete and ready for use. This bid item shall include material and placement of flowable fill under existing and proposed pavement, and wherever specified on the plans or in the specifications. No additional payment will be made for rock excavation. Measurement of quantities under this item shall be through fittings and encasements to a point at the outside face of manhole barrels, or to the point of main termination at dead ends or lamp holes. Carrier pipe placed within an encasement shall be paid under this item and shall include casing spacers and end seals. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

**S PIPE POINT REPAIR** This item is to be used to pay for repair of short lengths of existing sanitary sewer pipe that, through prior video inspection or other means, are known to have pre-existing failure. Pipe Point Repair may be needed in preparation for installation of cured-in-place-pipe (CIPP) lining or other instances where failure is known and repair is prudent. The size of pipe shall not be defined in separate bid items. All diameter sizes of point repair shall be paid under this one item. The materials to be used to make the repair shall be as defined on the plans or in the specifications. This bid item shall include all excavation, pipe materials, joining materials to connect old and new pipe, bedding, and backfill to complete the repair at the locations shown on the plans or as directed by the engineer, complete and ready for use. This bid item shall include bypass pumping when required. Measurement shall be from contact point to contact point of old and new pipe. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

**S PUMP STATION** This item is for payment for installation of sanitary pump stations including above or below ground structure for housing of the pumps. This item shall include all pumps, piping, fittings, valves, electrical components, building materials, concrete, any other appurtenances, labor, equipment, excavation, and backfill, to complete the pump station installation as required by the plans, standard drawings, and specifications, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall

be referenced. This item shall be paid LUMP SUM (LS) for each when complete.

**S STRUCTURE ABANDON** This item is to be used to pay for abandonment of larger above or below ground sewer structures such as air release/vacuum valve vaults, pump stations, tanks, etc. Payment under this time shall not be limited to size or scope; however structures with connecting pipes of 2 inches or less shall not be paid under this item; but, shall be considered incidental to sewer construction, (i.e., abandonment of standard air release/vacuum valves up to and including 2 inches would not be paid under this item). Payment under this item shall include all labor, equipment, and compacted fill or flowable fill for abandonment of the structure in place and restoration complete. No separate bid items will be established for size or structure variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

**S STRUCTURE REMOVAL** This item is to be used to pay for removal of larger above or below ground sewer structures such as air release/vacuum valve vaults, pump stations, tanks, and etc. Payment under this time shall not be limited to size or scope; however, structures with connecting pipes of 2 inches or less shall not be paid under this item; but, shall be considered incidental to sewer construction, (i.e., removal of standard air release/vacuum valves and their structure up to and including 2 inches would not be paid under this item). Payment under this item shall include all labor, equipment, and compacted backfill for removal of the structure and restoration complete. No separate bid items will be established for size or structure variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.





MATTHEW G. BEVIN  
GOVERNOR

CHARLES G. SNAVELY  
SECRETARY

**ENERGY AND ENVIRONMENT CABINET**

DEPARTMENT FOR ENVIRONMENTAL PROTECTION  
DIVISION OF WATER  
200 FAIR OAKS LANE, 4TH FLOOR  
FRANKFORT, KENTUCKY 40601  
[www.kentucky.gov](http://www.kentucky.gov)

May 25, 2016

Gary N Royalty  
Cynthiana Municipal Water Works  
104 E Pleasant St  
Cynthiana, KY 41031

RE: Cynthiana Municipal Water Works  
AI # 1756, APE20160002  
PWSID # 0490096-16-002  
KY 32 Intersection Improvements at  
Memorial Hospital  
Harrison County, KY

Dear Mr. Royalty:

We have reviewed the plans and specifications for the above referenced project. The plans include the construction of approximately 1,432 LF of 12-inch PVC and 722 LF of 8-inch PVC waterline. This is to advise that plans and specifications for the above referenced project are APPROVED with respect to sanitary features of design, as of this date with the requirements contained in the attached construction permit.

If you have any questions concerning this project, please contact Mr. Fred Sarabi at 502-564-3410 extension 4825.

Sincerely,

A handwritten signature in black ink, appearing to read "T. Humphries".

Terry Humphries, P.E.  
Supervisor, Engineering Section  
Water Infrastructure Branch  
Division of Water

TH:FS

Enclosures

C: HDR Engineering  
Harrison County Health Department  
Division of Plumbing

**Distribution-Water Line Extension**  
Cynthiana Municipal Water Works  
Facility Requirements

Activity ID No.:APE20160002

**PORT0000000015 (WLR) 1,432 LF of 12-inch PVC, and 722 LF of 8-inch PVC waterline:**

**Narrative Requirements:**

Condition No.	Condition
T-1	Construction of this project shall not result in the water system's inability to supply consistent water service in compliance with 401 KAR 8:010 through 8:600. [401 KAR 8:100 Section 5]
T-2	The public water system shall not implement a change to the approved plans without the prior written approval of the cabinet. [401 KAR 8:100 Section 4(3)]
T-3	A proposed change to the approved plans affecting sanitary features of design shall be submitted to the cabinet for approval in accordance with Section 2 of this administrative regulation. [401 KAR 8:100 Section 4(2)]
T-4	During construction, a set of approved plans and specifications shall be available at the job site. Construction shall be performed in accordance with the approved plans and specifications. [401 KAR 8:100 Section 3(1)]
T-5	Unless construction begins within two (2) years from the date of approval of the final plans and specifications, the approval shall expire. [401 KAR 8:100 Section 3(3)]
T-6	Upon completion of construction, a professional engineer shall certify in writing that the project has been completed in accordance with the approved plans and specifications. [401 KAR 8:100 Section 4(1)]
T-7	The system shall be designed to maintain a minimum pressure of 20 psi at ground level at all points in the distribution system under all conditions of flow. [Recommended Standards for Water Works 8.2.1, Drinking Water General Design Criteria IV.1.a]
T-8	Water lines should be hydraulically capable of a flow velocity of 2.5 ft/s while maintaining a pressure of at least 20 psi. [Drinking Water General Design Criteria IV.1.b]
T-9	The normal working pressure in the distribution system at the service connection shall not be less than 30 psi under peak demand flow conditions. Peak demand is defined as the maximum customer water usage rate, expressed in gallons per minute (gpm), in the pressure zone of interest during a 24 hour (diurnal) time period. [Drinking Water General Design Criteria IV.1.d]
T-10	When static pressure exceeds 150 psi, pressure reducing devices shall be provided on mains or as part of the meter setting on individual service lines in the distribution system. [Drinking Water General Design Criteria IV.1.c]
T-11	The minimum size of water main in the distribution system where fire protection is not to be provided should be a minimum of three (3) inch diameter. Any departure from minimum requirements shall be justified by hydraulic analysis and future water use, and can be considered only in special circumstances. [Recommended Standards for Water Works 8.2.2, Drinking Water General Design Criteria IV.2.b]

**Distribution-Water Line Extension**  
Cynthiana Municipal Water Works  
Facility Requirements

Activity ID No.:APE20160002

**PORT0000000015 (WLR) 1,432 LF of 12-inch PVC, and 722 LF of 8-inch PVC waterline:**

**Narrative Requirements:**

Condition No.	Condition
T-12	Water mains not designed to carry fire-flows shall not have fire hydrants connected to them. [Recommended Standards for Water Works 8.4.1.b]
T-13	Flushing devices should be sized to provide flows which will give a velocity of at least 2.5 feet per second in the water main being flushed. [Recommended Standards for Water Works 8.2.4.b, Recommended Standards for Water Works 8.4.1.b]
T-14	No flushing device shall be directly connected to any sewer. [Recommended Standards for Water Works 8.2.4.b, Recommended Standards for Water Works 8.4.1.b]
T-15	Pipe shall be constructed to a depth providing a minimum cover of 30 inches to top of pipe. [Drinking Water General Design Criteria IV.3.a]
T-16	Water mains shall be covered with sufficient earth or other insulation to prevent freezing. [Recommended Standards for Water Works 8.7]
T-17	A continuous and uniform bedding shall be provided in the trench for all buried pipe. Backfill material shall be tamped in layers around the pipe and to a sufficient height above the pipe to adequately support and protect the pipe. Stones found in the trench shall be removed for a depth of at least six inches below the bottom of the pipe. [Recommended Standards for Water Works 8.7]
T-18	Water line installation shall incorporate the provisions of the AWWA standards and/or manufacturer's recommended installation procedures. [Recommended Standards for Water Works 8.7]
T-19	All materials used for the rehabilitation of water mains shall meet ANSI/NSF standards. [Recommended Standards for Water Works 8.1]
T-20	Packing and jointing materials used in the joints of pipe shall meet the standards of AWWA and the reviewing authority. [Recommended Standards for Water Works 8.1]
T-21	All tees, bends, plugs and hydrants shall be provided with reaction blocking, tie rods or joints designed to prevent movement. [Recommended Standards for Water Works 8.7]
T-22	All materials including pipe, fittings, valves and fire hydrants shall conform to the latest standards issued by the ASTM, AWWA and ANSI/NSF, where such standards exist, and be acceptable to the Division of Water. [Recommended Standards for Water Works 8.1]
T-23	Water mains which have been used previously for conveying potable water may be reused provided they meet the above standards and have been restored practically to their original condition. [Recommended Standards for Water Works 8.1]

**Distribution-Water Line Extension**  
Cynthiana Municipal Water Works  
Facility Requirements

Activity ID No.:APE20160002

**PORT0000000015 (WLR) 1,432 LF of 12-inch PVC, and 722 LF of 8-inch PVC waterline:**

**Narrative Requirements:**

Condition No.	Condition
T-24	Manufacturer approved transition joints shall be used between dissimilar piping materials. [Recommended Standards for Water Works 8.1]
T-25	Pipes and pipe fittings containing more than 8% lead shall not be used. All products shall comply with ANSI/NSF standards. [Recommended Standards for Water Works 8.1]
T-26	The minimum size of water main which provides for fire protection and serving fire hydrants shall be six-inch diameter. [Recommended Standards for Water Works 8.2, Drinking Water General Design Criteria IV.2.a]
T-27	Gaskets containing lead shall not be used. Repairs to lead-joint pipe shall be made using alternative methods. [Recommended Standards for Water Works 8.1]
T-28	Pipe materials shall be selected to protect against both internal and external pipe corrosion. [Recommended Standards for Water Works 8.1]
T-29	Dead end mains shall be equipped with a means to provide adequate flushing. [Recommended Standards for Water Works 8.2]
T-30	The hydrant lead shall be a minimum of six inches in diameter. Auxiliary valves shall be installed on all hydrant leads. [Recommended Standards for Water Works 8.4.3]
T-31	A sufficient number of valves shall be provided on water mains to minimize inconvenience and sanitary hazards during repairs. [Recommended Standards for Water Works 8.3]
T-32	Wherever possible, chambers, pits or manholes containing valves, blow-offs, meters, or other such appurtenances to a distribution system, shall not be located in areas subject to flooding or in areas of high groundwater. Such chambers or pits should drain to the ground surface, or to absorption pits underground. The chambers, pits and manholes shall not connect directly to any storm drain or sanitary sewer. Blow-offs shall not connect directly to any storm drain or sanitary sewer. [Recommended Standards for Water Works 8.6]
T-33	At high points in water mains where air can accumulate provisions shall be made to remove the air by means of air relief valves. [Recommended Standards for Water Works 8.5.1]
T-34	Automatic air relief valves shall not be used in situations where flooding of the manhole or chamber may occur. [Recommended Standards for Water Works 8.5.1]

**Distribution-Water Line Extension**  
Cynthiana Municipal Water Works  
Facility Requirements

Activity ID No.:APE20160002

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**PORT0000000015 (WLR) 1,432 LF of 12-inch PVC, and 722 LF of 8-inch PVC waterline:**

**Narrative Requirements:**

Condition No.	Condition
T-35	The open end of an air relief pipe from automatic valves shall be extended to at least one foot above grade and provided with a screened, downward-facing elbow. [Recommended Standards for Water Works 8.5.2.c]
T-36	Discharge piping from air relief valves shall not connect directly to any storm drain, storm sewer, or sanitary sewer. [Recommended Standards for Water Works 8.5.2.d]
T-37	Water pipe shall be constructed with a lateral separation of 10 feet or more from any gravity sanitary or combined sewer measured edge to edge where practical. If not practical a variance may be requested to allow the water pipe to be installed closer to the gravity sanitary or combined sewer provided the water pipe is laid in a separate trench or undisturbed shelf located on one side of the sewer with the bottom of the pipe at least 18 inches above the top of the gravity sanitary or combined sewer pipe. [Drinking Water General Design Criteria IV.3.b]
T-38	Water lines crossing sanitary, combined or storm sewers shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sanitary, combined or storm sewer with preference to the water main located above the sanitary, combined or storm sewer. [Drinking Water General Design Criteria IV.3.c]
T-39	At crossings, one full length of water pipe shall be located so both joints will be as far from the sewer as possible. [Recommended Standards for Water Works 8.8.3.b]
T-40	There shall be no connection between the distribution system and any pipes, pumps, hydrants, or tanks whereby unsafe water or other contaminating materials may be discharged or drawn into the system. [Recommended Standards for Water Works 8.10.1]
T-41	Water utilities shall have a cross connection program conforming to 401 KAR 8. [Recommended Standards for Water Works 8.10.1]
T-42	Installed pipe shall be pressure tested and leakage tested in accordance with the appropriate AWWA Standards. [Recommended Standards for Water Works 8.7.6]
T-43	New, cleaned and repaired water mains shall be disinfected in accordance with AWWA Standard C651. The specifications shall include detailed procedures for the adequate flushing, disinfection, and microbiological testing of all water mains. In an emergency or unusual situation, the disinfection procedure shall be discussed with the Division of Water. [Recommended Standards for Water Works 8.7.7]
T-44	A minimum cover of five feet shall be provided over pipe crossing underwater. [Recommended Standards for Water Works 8.9.2]
T-45	Valves shall be provided at both ends of water crossings so that the section can be isolated for testing or repair; the valves shall be easily accessible, and not subject to flooding for pipes crossing underwater. [Recommended Standards for Water Works 8.9.2.b]

**Distribution-Water Line Extension**  
Cynthiana Municipal Water Works  
Facility Requirements

Activity ID No.:APE20160002

Page 5 of 5

**PORT0000000015 (WLR) 1,432 LF of 12-inch PVC, and 722 LF of 8-inch PVC waterline:**

**Narrative Requirements:**

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Condition No.	Condition
T-46	Permanent taps or other provisions to allow insertion of a small meter to determine leakage and obtain water samples on each side of the valve closest to the supply source for pipes crossing. [Recommended Standards for Water Works 8.9.2.c]

## ***SPECIAL NOTE***

### **Filing of eNOI for KPDES Construction Stormwater Permit**

**County: Harrison**

**Route: KY 36**

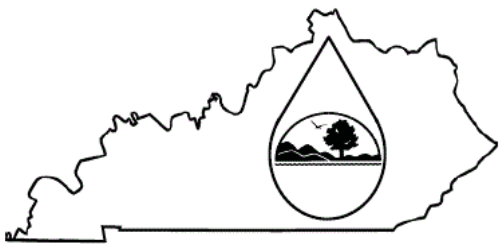
**Item No.: 6-908**

**KDOW Submittal ID:** 54c8f791-c21a-4152-af26-  
141e76de604f

**Project Description:** Construct Left Turn Lanes at Memorial Hospital

**A Notice of Intent for obtaining coverage under the Kentucky Pollutant Discharge Elimination System (KPDES) General Permit for Stormwater Discharges Associated with Construction Activities (KYR10) has been drafted, copy of which is attached. Upon award, the Contractor will be identified in Section III of the form as the “Building Contractor” and it will be submitted for approval to the Kentucky Division of Water. The Contractor shall be responsible for advancing the work in a manner that is compliant with all applicable and appropriate KYTC specifications for sediment and erosion control as well as meeting the requirements of the KYR10 permit and the KDOW.**

**If there are any questions regarding this note, please contact David Waldner, Director, Division of Environmental Analysis, TCOB, 200 Mero Street, Frankfort, KY 40622, Phone: (502) 564-7250.**

	<h2 style="margin: 0;">KENTUCKY POLLUTION DISCHARGE ELIMINATION SYSTEM (KPDES)</h2> <p style="margin: 5px 0;">Notice of Intent (NOI) for coverage of Storm Water Discharge Associated with Construction Activities Under the KPDES Storm Water General Permit KYR100000</p> <p style="margin: 5px 0;"><a href="#">Click here for Instructions (Controls/KPDES_FormKYR10_Instructions.htm)</a></p> <p style="margin: 5px 0;"><a href="http://dep.ky.gov/formslibrary/Documents/KYR10PermitPage.pdf">Click here to obtain information and a copy of the KPDES General Permit. (http://dep.ky.gov/formslibrary/Documents/KYR10PermitPage.pdf)</a></p> <p style="margin: 5px 0; font-size: small;">(*) indicates a required field; (✓) indicates a field may be required based on user input or is an optionally required field</p>
---	---

Reason for Submittal:(*) <input type="text" value="Application for New Permit Coverage"/>	Agency Interest ID: <input type="text" value="Agency Interest ID"/>	Permit Number:(✓) <input type="text" value="KPDES Permit Number"/>
--	--	---

If change to existing permit coverage is requested, describe the changes for which modification of coverage is being sought:(✓)

**ELIGIBILITY:**  
Stormwater discharges associated with construction activities disturbing individually one (1) acre or more, including, in the case of a common plan of development, contiguous construction activities that cumulatively equal one (1) acre or more of disturbance.

**EXCLUSIONS:**  
The following are excluded from coverage under this general permit:  
 1) Are conducted at or on properties that have obtained an individual KPDES permit for the discharge of other wastewaters which requires the development and implementation of a Best Management Practices (BMP) plan;  
 2) Any operation that the DOW determines an individual permit would better address the discharges from that operation;  
 3) Any project that discharges to an Impaired Water listed in the most recent Integrated Report, §305(b) as impaired for sediment and for which an approved TMDL has been developed.

**SECTION I -- FACILITY OPERATOR INFORMATION (PERMITTEE)**

Company Name:(✓) <input type="text" value="Kentucky Transportation Cabinet"/>	First Name:(✓) <input type="text" value="Robert"/>	M.I.: <input type="text" value="A"/>	Last Name:(✓) <input type="text" value="Yeager"/>
Mailing Address:(*) <input type="text" value="421 Buttermilk Pike"/>	City:(*) <input type="text" value="Covington"/>	State:(*) <input type="text" value="Kentucky"/>	Zip:(*) <input type="text" value="41017"/>
eMail Address:(*) <input type="text" value="Kevin.Rust@ky.gov"/>	Business Phone:(*) <input type="text" value="(859)341-2700"/>	Alternate Phone: <input type="text" value="Phone"/>	

**SECTION II -- GENERAL SITE LOCATION INFORMATION**

Project Name:(*) <input type="text" value="KY 36 at Memorial Hospital"/>	Status of Owner/Operator(*) <input type="text" value="State Government"/>	SIC Code(*) <input type="text" value="1611 Highway and Street Const"/>
Company Name:(✓) <input type="text" value="Company Name"/>	First Name:(✓) <input type="text" value="First Name"/>	M.I.: <input type="text" value="MI"/>
Last Name:(✓) <input type="text" value="Last Name"/>		
Site Physical Address:(*) <input type="text" value="1210 Kentucky 36 E"/>		
City:(*) <input type="text" value="Cynthiana"/>	State:(*) <input type="text" value="Kentucky"/>	Zip:(*) <input type="text" value="41031"/>
County:(*) <input type="text" value="Harrison"/>	Latitude(decimal degrees)(*)DMS to DD Converter ( <a href="https://www.fcc.gov/media/radio/dms-decimal">https://www.fcc.gov/media/radio/dms-decimal</a> ) <input type="text" value="38.385497"/>	Longitude(decimal degrees)(*) <input type="text" value="-84.277289"/>

**SECTION III -- SPECIFIC SITE ACTIVITY INFORMATION**

Project Description:(\*)

a. For single projects provide the following information



Total Number of Acres in Project:(√) <input style="width:95%;" type="text" value="2.0"/>	Total Number of Acres Disturbed:(√) <input style="width:95%;" type="text" value="2.0"/>
Anticipated Start Date:(√) <input style="width:95%;" type="text" value="8/28/2017"/>	Anticipated Completion Date:(√) <input style="width:95%;" type="text" value="9/3/2018"/>

b. For common plans of development provide the following information

Total Number of Acres in Project:(√) <input style="width:95%;" type="text" value="# Acre(s)"/>	Total Number of Acres Disturbed:(√) <input style="width:95%;" type="text" value="# Acre(s)"/>
Number of individual lots in development, if applicable:(√) <input style="width:95%;" type="text" value="# lot(s)"/>	Number of lots in development:(√) <input style="width:95%;" type="text" value="# lot(s)"/>
Total acreage of lots intended to be developed:(√) <input style="width:95%;" type="text" value="Project Acres"/>	Number of acres intended to be disturbed at any one time:(√) <input style="width:95%;" type="text" value="Disturbed Acres"/>
Anticipated Start Date:(√) <input style="width:95%;" type="text"/>	Anticipated Completion Date:(√) <input style="width:95%;" type="text"/>

List Building Contractor(s) at the time of Application:(\*)

	Company Name		
+			

SECTION IV -- IF THE PERMITTED SITE DISCHARGES TO A WATER BODY THE FOLLOWING INFORMATION IS REQUIRED

Discharge Point(s):

	Unnamed Tributary?	Latitude	Longitude	Receiving Water Name	
1	Yes	38.384475	-84.275672		Delete
2	Yes	38.3854972	-84.277289		Delete
3	Yes	38.3855944	-84.277658		Delete
+					

SECTION V -- IF THE PERMITTED SITE DISCHARGES TO A MS4 THE FOLLOWING INFORMATION IS REQUIRED

Name of MS4: <input style="width:95%;" type="text"/>											
Date of application/notification to the MS4 for construction site permit coverage: <input style="width:95%;" type="text" value="Date"/>	Discharge Point(s):(*) <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:5%;"></th> <th style="width:15%;">Latitude</th> <th style="width:15%;">Longitude</th> <th style="width:15%;"></th> <th style="width:15%;"></th> </tr> </thead> <tbody> <tr> <td style="text-align:center;">+</td> <td style="height: 50px;"></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Latitude	Longitude			+				
	Latitude	Longitude									
+											

SECTION VI -- WILL THE PROJECT REQUIRE CONSTRUCTION ACTIVITIES IN A WATER BODY OR THE RIPARIAN ZONE?

Will the project require construction activities in a water body or the riparian zone?: (*)	<input style="width:95%;" type="text" value="No"/>
If Yes, describe scope of activity: (√)	<input style="width:95%;" type="text" value="describe scope of activity"/>
Is a Clean Water Act 404 permit required?:(*)	<input style="width:95%;" type="text" value="No"/>

Is a Clean Water Act 401 Water Quality Certification required?:(*)	No <span style="float:right;">▼</span>
--	--

<b>SECTION VII -- NOI PREPARER INFORMATION</b>				
First Name:(*) <input type="text" value="First Name"/>	M.I.: <input type="text" value="MI"/>	Last Name:(*) <input type="text" value="Last Name"/>	Company Name:(*) <input type="text" value="Company Name"/>	
Mailing Address:(*) <input type="text" value="Mailing Address"/>	City:(*) <input type="text" value="City"/>	State:(*) <input type="text" value="State"/>	Zip:(*) <input type="text" value="Zip"/>	
eMail Address:(*) <input type="text" value="eMail Address"/>	Business Phone:(*) <input type="text" value="Phone"/>	Alternate Phone: <input type="text" value="Phone"/>		

<b>SECTION VIII -- ATTACHMENTS</b>	
Facility Location Map:(*)	<input type="button" value="Upload file"/>
Supplemental Information:	<input type="button" value="Upload file"/>

<b>SECTION IX -- CERTIFICATION</b>			
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.			
Signature:(*) <input type="text" value="Signature"/>	Title:(*) <input type="text" value="Title"/>		
First Name:(*) <input type="text" value="First Name"/>	M.I.: <input type="text" value="MI"/>	Last Name:(*) <input type="text" value="Last Name"/>	
eMail Address:(*) <input type="text" value="eMail Address"/>	Business Phone:(*) <input type="text" value="Phone"/>	Alternate Phone: <input type="text" value="Phone"/>	Signature Date:(*) <input type="text" value="Date"/>

<input type="button" value="Click to Save Values for Future Retrieval"/>	<input type="button" value="Click to Submit to DEP"/>
--	---

KyTC BMP Plan for Project PCN ## - #####



**Kentucky Transportation Cabinet**

**Highway District 6**

**And**

\_\_\_\_\_ **(2), Construction**

**Kentucky Pollutant Discharge Elimination System**

**Permit KYR10**

**Best Management Practices (BMP) plan**

**Groundwater protection plan**

**For Highway Construction Activities**

**For**

**Memorial Hospital Turn Lane**

**Project: PCN ## - #####**

**Item 06-908.00**

## KyTC BMP Plan for Project PCN ## - ####

### Project information

Note – (1) = Design (2) = Construction (3) = Contractor

1. Owner – Kentucky Transportation Cabinet, District 6
2. Resident Engineer: (2)
3. Contractor name: (2)  
Address: (2)  
  
Phone number: (2)  
Contact: (2)  
Contractors agent responsible for compliance with the KPDES permit requirements (3):
4. Project Control Number (2)
5. Route (Address) KY 32
6. Latitude/Longitude (project mid-point) dd/mm/ss, dd/mm/ss 38^23'05" north, 84^16'36" west
7. County (project mid-point) Harrison County
8. Project start date (date work will begin): (2)
9. Projected completion date: (2)

## KyTC BMP Plan for Project PCN ## - #####

### A. Site description:

1. Nature of Construction Activity (from letting project description) **Roadway reconstruction**
2. Order of major soil disturbing activities **(2) and (3)**
3. Projected volume of material to be moved **44,101 CY**
4. Estimate of total project area (acres) **2 Acres**
5. Estimate of area to be disturbed (acres) **2 Acres**
6. Post construction runoff coefficient will be included in the project drainage folder. Persons needing information pertaining to the runoff coefficient will contact the resident engineer to request this information. **0.9**
7. Data describing existing soil condition **(2)**
8. Data describing existing discharge water quality (if any) **(2)**
9. Receiving water name, **Flat Run**
10. TMDLs and Pollutants of Concern in Receiving Waters: **(1 DEA)**
11. Site map – Project layout sheet plus the erosion control sheets in the project plans that depict Disturbed Drainage Areas (DDAs) and related information. These sheets depict the existing project conditions with areas delineated by DDA (drainage area bounded by watershed breaks and right of way limits), the storm water discharge locations (either as a point discharge or as overland flow) and the areas that drain to each discharge point. These plans define the limits of areas to be disturbed and the location of control measures. Controls will be either site specific as designated by the designer or will be annotated by the contractor and resident engineer before disturbance commences. The project layout sheet shows the surface waters and wetlands.
12. Potential sources of pollutants:  
  
The primary source of pollutants is solids that are mobilized during storm events. Other sources of pollutants include oil/fuel/grease from servicing and operating construction equipment, concrete washout water, sanitary wastes and trash/debris. **(3)**

## KyTC BMP Plan for Project PCN ## - #####

### **B. Sediment and Erosion Control Measures:**

1. Plans for highway construction projects will include erosion control sheets that depict Disturbed Drainage Areas (DDAs) and related information. These plan sheets will show the existing project conditions with areas delineated by DDA within the right of way limits, the discharge points and the areas that drain to each discharge point. Project managers and designers will analyze the DDAs and identify Best Management Practices (BMPs) that are site specific. The balance of the BMPs for the project will be listed in the bid documents for selection and use by the contractor on the project with approval by the resident engineer.

Projects that do not have DDAs annotated on the erosion control sheets will employ the same concepts for development and managing BMP plans.

2. Following award of the contract, the contractor and resident engineer will annotate the erosion control sheets showing location and type of BMPs for each of the DDAs that will be disturbed at the outset of the project. This annotation will be accompanied by an order of work that reflects the order or sequence of major soil moving activities. The remaining DDAs are to be designated as "Do Not Disturb" until the contractor and resident engineer prepare the plan for BMPs to be employed. The initial BMP's shall be for the first phase (generally Clearing and Grubbing) and shall be modified as needed as the project changes phases. The BMP Plan will be modified to reflect disturbance in additional DDA's as the work progresses. All DDA's will have adequate BMP's in place before being disturbed.
3. As DDAs are prepared for construction, the following will be addressed for the project as a whole or for each DDA as appropriate:
  - Construction Access – This is the first land-disturbing activity. As soon as construction begins, bare areas will be stabilized with gravel and temporary mulch and/or vegetation.
  - At the beginning of the project, all DDAs for the project will be inspected for areas that are a source of storm water pollutants. Areas that are a source of pollutants will receive appropriate cover or BMPs to arrest the introduction of pollutants into storm water. Areas that have not been opened by the contractor will be inspected periodically (once per month) to determine if there is a need to employ BMPs to keep pollutants from entering storm water.

## KyTC BMP Plan for Project PCN ## - #####

- Clearing and Grubbing – The following BMP's will be considered and used where appropriate.
  - Leaving areas undisturbed when possible.
  - Silt basins to provide silt volume for large areas.
  - Silt Traps Type A for small areas.
  - Silt Traps Type C in front of existing and drop inlets which are to be saved
  - Diversion ditches to catch sheet runoff and carry it to basins or traps or to divert it around areas to be disturbed.
  - Brush and/or other barriers to slow and/or divert runoff.
  - Silt fences to catch sheet runoff on short slopes. For longer slopes, multiple rows of silt fence may be considered.
  - Temporary Mulch for areas which are not feasible for the fore mentioned types of protections.
  - Non-standard or innovative methods.
- Cut & Fill and placement of drainage structures - The BMP Plan will be modified to show additional BMP's such as:
  - Silt Traps Type B in ditches and/or drainways as they are completed
  - Silt Traps Type C in front of pipes after they are placed
  - Channel Lining
  - Erosion Control Blanket
  - Temporary mulch and/or seeding for areas where construction activities will be ceased for 21 days or more.
  - Non-standard or innovative methods
- Profile and X-Section in place – The BMP Plan will be modified to show elimination of BMP's which had to be removed and the addition of new BMP's as the roadway was shaped. Probably changes include:
  - Silt Trap Type A, Brush and/or other barriers, Temporary Mulch, and any other BMP which had to be removed for final grading to take place.
  - Additional Silt Traps Type B and Type C to be placed as final drainage patterns are put in place.
  - Additional Channel Lining and/or Erosion Control Blanket.
  - Temporary Mulch for areas where Permanent Seeding and Protection cannot be done within 21 days.
  - Special BMP's such as Karst Policy
- Finish Work (Paving, Seeding, Protect, etc.) – A final BMP Plan will result from modifications during this phase of construction. Probably changes include:
  - Removal of Silt Traps Type B from ditches and drainways if they are protected with other BMP's which are sufficient to control erosion, i.e. Erosion Control Blanket or Permanent Seeding and Protection on moderate grades.

## KyTC BMP Plan for Project PCN ## - #####

- Permanent Seeding and Protection
  - Placing Sod
  - Planting trees and/or shrubs where they are included in the project
- BMP's including Storm Water Management Devices such as velocity dissipation devices and Karst policy BMP's to be installed during construction to control the pollutants in storm water discharges that will occur after construction has been completed are : N/A

### **C. Other Control Measures**

1. No solid materials, including building materials, shall be discharged to waters of the commonwealth, except as authorized by a Section 404 permit.
2. Waste Materials

All waste materials that may leach pollutants (paint and paint containers, caulk tubes, oil/grease containers, liquids of any kind, soluble materials, etc.) will be collected and stored in appropriate covered waste containers. Waste containers shall be removed from the project site on a sufficiently frequent basis as to not allow wastes to become a source of pollution. All personnel will be instructed regarding the correct procedure for waste disposal. Wastes will be disposed in accordance with appropriate regulations. Notices stating these practices will be posted in the office.

3. Hazardous Waste

All hazardous waste materials will be managed and disposed of in the manner specified by local or state regulation. The contractor shall notify the Resident Engineer if there any hazardous wastes being generated at the project site and how these wastes are being managed. Site personnel will be instructed with regard to proper storage and handling of hazardous wastes when required. The Transportation Cabinet will file for generator, registration when appropriate, with the Division of Waste Management and advise the contractor regarding waste management requirements.

4. Spill Prevention

The following material management practices will be used to reduce the risk of spills or other exposure of materials and substances to the weather and/or runoff.

- **Good Housekeeping:**



## KyTC BMP Plan for Project PCN ## - #####

The following good housekeeping practices will be followed onsite during the construction project.

- An effort will be made to store only enough product required to do the job
- All materials stored onsite will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure
- Products will be kept in their original containers with the original manufacturer's label
- Substances will not be mixed with one another unless recommended by the manufacturer
- Whenever possible, all of the product will be used up before disposing of the container
- Manufacturers' recommendations for proper use and disposal will be followed
- The site contractor will inspect daily to ensure proper use and disposal of materials onsite

### ➤ **Hazardous Products:**

These practices will be used to reduce the risks associated with any and all hazardous materials.

- Products will be kept in original containers unless they are not resealable
- Original labels and material safety data sheets (MSDS) will be reviewed and retained
- Contractor will follow procedures recommended by the manufacturer when handling hazardous materials
- If surplus product must be disposed of, manufacturers' or state/local recommended methods for proper disposal will be followed

**The following product-specific practices will be followed onsite:**

### ➤ **Petroleum Products:**

Vehicles and equipment that are fueled and maintained on site will be monitored for leaks, and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products onsite will be stored in tightly sealed containers, which are clearly labeled and will be protected from exposure to weather.

The contractor shall prepare an Oil Pollution Spill Prevention Control and Countermeasure plan when the project that involves the storage of petroleum products in 55 gallon or larger containers with a total combined storage capacity of 1,320 gallons. This is a requirement of 40 CFR 112.

## KyTC BMP Plan for Project PCN ## - #####

This project (will / will not) (3) have over 1,320 gallons of petroleum products with a total capacity, sum of all containers 55 gallon capacity and larger.

### ➤ **Fertilizers:**

Fertilizers will be applied at rates prescribed by the contract, standard specifications or as directed by the resident engineer. Once applied, fertilizer will be covered with mulch or blankets or worked into the soil to limit exposure to storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

### ➤ **Paints:**

All containers will be tightly sealed and stored indoors or under roof when not being used. Excess paint or paint wash water will not be discharged to the drainage or storm sewer system but will be properly disposed of according to manufacturers' instructions or state and local regulations.

### ➤ **Concrete Truck Washout:**

Concrete truck mixers and chutes will not be washed on pavement, near storm drain inlets, or within 75 feet of any ditch, stream, wetland, lake, or sinkhole. Where possible, excess concrete and wash water will be discharged to areas prepared for pouring new concrete, flat areas to be paved that are away from ditches or drainage system features, or other locations that will not drain off site. Where this approach is not possible, a shallow earthen wash basin will be excavated away from ditches to receive the wash water

### ➤ **Spill Control Practices**

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup:

- Manufacturers' recommended methods for spill cleanup will be clearly posted. All personnel will be made aware of procedures and the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area. Equipment and materials will include as appropriate, brooms, dust pans, mops, rags, gloves, oil absorbents, sand, sawdust, and plastic and metal trash containers.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.

## KyTC BMP Plan for Project PCN ## - #####

- Spills of toxic or hazardous material will be reported to the appropriate state/local agency as required by KRS 224 and applicable federal law.
- The spill prevention plan will be adjusted as needed to prevent spills from reoccurring and improve spill response and cleanup.
- Spills of products will be cleaned up promptly. Wastes from spill clean up will be disposed in accordance with appropriate regulations.

### **D. Other State and Local Plans**

This BMP plan shall include any requirements specified in sediment and erosion control plans, storm water management plans or permits that have been approved by other state or local officials. Upon submittal of the NOI, other requirements for surface water protection are incorporated by reference into and are enforceable under this permit (even if they are not specifically included in this BMP plan). This provision does not apply to master or comprehensive plans, non-enforceable guidelines or technical guidance documents that are not identified in a specific plan or permit issued for the construction site by state or local officials.

### **E. Maintenance**

1. The BMP plan shall include a clear description of the maintenance procedures necessary to keep the control measures in good and effective operating condition.
- Maintenance of BMPs during construction shall be a result of weekly and post rain event inspections with action being taken by the contractor to correct deficiencies.
  - Post Construction maintenance will be a function of normal highway maintenance operations. Following final project acceptance by the cabinet, district highway crews will be responsible for identification and correction of deficiencies regarding ground cover and cleaning of storm water BMPs. The project manager shall identify any BMPs that will be for the purpose of post construction storm water management with specific guidance for any non-routine maintenance.

### **F. Inspections**

Inspection and maintenance practices that will be used to maintain erosion and sediment controls:

## KyTC BMP Plan for Project PCN ## - #####

- All erosion prevention and sediment control measures will be inspected at least once each week and following any rain of one-half inch or more.
- Inspections will be conducted by individuals that have successfully completed the KEPSC-RI course as required by Section 213.02.02 of the Standard Specifications for Road and Bridge Construction, current edition.
- Inspection reports will be written, signed, dated, and kept on file.
- Areas at final grade will be seeded and mulched within 14 days.
- Areas that are not at final grade where construction has ceased for a period of 21 days or longer and soil stock piles shall receive temporary mulch no later than 14 days from the last construction activity in that area.
- All measures will be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours of being reported.
- Built-up sediment will be removed from behind the silt fence before it has reached halfway up the height of the fence.
- Silt fences will be inspected for bypassing, overtopping, undercutting, depth of sediment, tears, and to ensure attachment to secure posts.
- Sediment basins will be inspected for depth of sediment, and built-up sediment will be removed when it reaches 70 percent of the design capacity and at the end of the job.
- Diversion dikes and berms will be inspected and any breaches promptly repaired. Areas that are eroding or scouring will be repaired and re-seeded / mulched as needed.
- Temporary and permanent seeding and mulching will be inspected for bare spots, washouts, and healthy growth. Bare or eroded areas will be repaired as needed.
- All material storage and equipment servicing areas that involve the management of bulk liquids, fuels, and bulk solids will be inspected weekly for conditions that represent a release or possible release of pollutants to the environment.

## **G. Non – Storm Water discharges**

It is expected that non-storm water discharges may occur from the site during the construction period. Examples of non-storm water discharges include:

- Water from water line flushings.
- Water from cleaning concrete trucks and equipment.
- Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred).

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- Uncontaminated groundwater and rain water (from dewatering during excavation).

All non-storm water discharges will be directed to the sediment basin or to a filter fence enclosure in a flat vegetated infiltration area or be filtered via another approved commercial product.

### H. Groundwater Protection Plan (3)

This plan serves as the groundwater protection plan as required by 401 KAR 5:037.

- Contractors statement: (3)

The following activities, as enumerated by 401 KAR 5:037 Section 2 that require the preparation and implementation of a groundwater protection plan, will or may be conducted as part of this construction project:

\_\_\_\_\_ 2. (e) land treatment or land disposal of a pollutant;

\_\_\_\_\_ 2. (f) Storing, ..., or related handling of hazardous waste, solid waste or special waste, ..., in tanks, drums, or other containers, or in piles, (This does not include wastes managed in a container placed for collection and removal of municipal solid waste for disposal off site);

\_\_\_\_\_ 2. (g) .... Handling of materials in bulk quantities (equal or greater than 55 gallons or 100 pounds net dry weight transported held in an individual container) that, if released to the environment, would be a pollutant;

\_\_\_\_\_ 2. (j) Storing or related handling of road oils, dust suppressants, ....., at a central location;

\_\_\_\_\_ 2. (k) Application or related handling of road oils, dust suppressants or deicing materials, (does not include use of chloride-based deicing materials applied to roads or parking lots);

\_\_\_\_\_ 2. (m) Installation, construction, operation, or abandonment of wells, bore holes, or core holes, (this does not include bore holes for the purpose of explosive demolition);

Or, check the following only if there are no qualifying activities

\_\_\_\_\_ There are no activities for this project as listed in 401 KAR 5:037 Section 2 that require the preparation and implementation of a groundwater protection plan.

## KyTC BMP Plan for Project PCN ## - #####

The contractor is responsible for the preparation of a plan that addresses the

401 KAR 5:037 Section 3. (3) Elements of site specific groundwater protection plan:

- (a) General information about this project is covered in the Project information;
- (b) Activities that require a groundwater protection plan have been identified above;
- (c) Practices that will protect groundwater from pollution are addressed in section C. Other control measures.
- (d) Implementation schedule – all practices required to prevent pollution of groundwater are to be in place prior to conducting the activity;
- (e) Training is required as a part of the ground water protection plan. All employees of the contractor, sub-contractor and resident engineer personnel will be trained to understand the nature and requirements of this plan as they pertain to their job function(s). Training will be accomplished within one week of employment and annually thereafter. A record of training will be maintained by the contractor with a copy provide to the resident engineer.
- (f) Areas of the project and groundwater plan activities will be inspected as part of the weekly sediment and erosion control inspections
- (g) Certification (see signature page.)





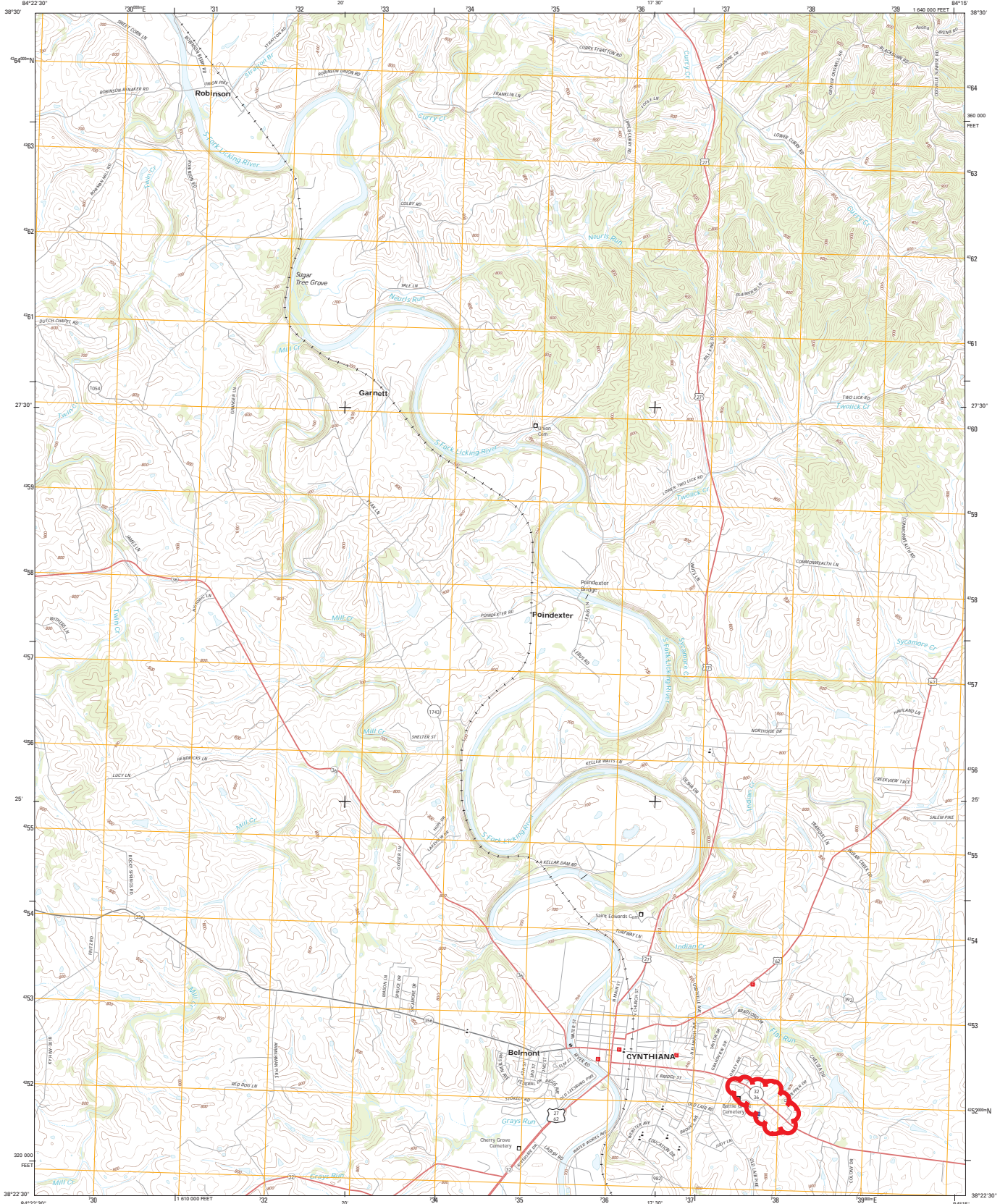




U.S. DEPARTMENT OF THE INTERIOR  
 U.S. GEOLOGICAL SURVEY

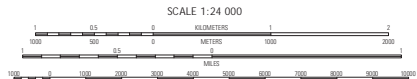
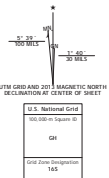


CYNTHIANA QUADRANGLE  
 KENTUCKY-HARRISON CO.  
 7.5-MINUTE SERIES



Produced by the United States Geological Survey  
 North American Datum of 1983 (NAD83)  
 World Geodetic System of 1984 (WGS84) Projection and  
 1 000-foot grid. Universal Transverse Mercator, Zone 18S  
 11 000-foot ticks. Kentucky Coordinate System of 1983 (per  
 zone)

Imagery: NADP, Aug. 2012  
 Roads: ©2006-2012 TomTom  
 Names: ©2006-2012 TomTom  
 Hydrography: National Hydrography Dataset, 2012  
 Contours: National Elevation Dataset, 2002  
 Boundaries: Census, IBIC, USGS, 1972-2012



CONTOUR INTERVAL 20 FEET  
 NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the  
 National Geospatial Program US Topo Product Standards, 2011.  
 A metadata file associated with this product is draft version 0.8



QUADRANGLE LOCATION

Berry	Kelley	Clayton
Beauregard	Cynthiana	Shady Knoll
Leadbald	Shawhan	Millsboro

ROAD CLASSIFICATION  
 Expressway  
 Secondary Hwy  
 Ramp  
 Interstate Route  
 Local Connector  
 Local Road  
 #RD  
 US Route  
 State Route

CYNTHIANA, KY  
 2013

ADJOINING 7.5 QUADRANGLES

**PART II**  
**SPECIFICATIONS AND STANDARD DRAWINGS**

### **SPECIFICATIONS REFERENCE**

Any reference in the plans or proposal to previous editions of the *Standard Specifications for Road and Bridge Construction* and *Standard Drawings* are superseded by *Standard Specifications for Road and Bridge Construction, Edition of 2012* and *Standard Drawings, Edition of 2016*.

## **SUPPLEMENTAL SPECIFICATIONS**

The contractor shall use the Supplemental Specifications that are effective at the time of letting.  
The Supplemental Specifications can be found at the following link:

<http://transportation.ky.gov/Construction/Pages/Kentucky-Standard-Specifications.aspx>

### **SPECIAL NOTE FOR PORTABLE CHANGEABLE MESSAGE SIGNS**

This Special Note will apply when indicated on the plans or in the proposal.

**1.0 DESCRIPTION.** Furnish, install, operate, and maintain variable message signs at the locations shown on the plans or designated by the Engineer. Remove and retain possession of variable message signs when they are no longer needed on the project.

#### **2.0 MATERIALS.**

**2.1 General.** Use LED Variable Message Signs Class I, II, or III, as appropriate, from the Department's List of Approved Materials.

Unclassified signs may be submitted for approval by the Engineer. The Engineer may require a daytime and nighttime demonstration. The Engineer will make a final decision within 30 days after all required information is received.

#### **2.2 Sign and Controls.** All signs must:

- 1) Provide 3-line messages with each line being 8 characters long and at least 18 inches tall. Each character comprises 35 pixels.
- 2) Provide at least 40 preprogrammed messages available for use at any time. Provide for quick and easy change of the displayed message; editing of the message; and additions of new messages.
- 3) Provide a controller consisting of:
  - a) Keyboard or keypad.
  - b) Readout that mimics the actual sign display. (When LCD or LCD type readout is used, include backlighting and heating or otherwise arrange for viewing in cold temperatures.)
  - c) Non-volatile memory or suitable memory with battery backup for storing pre-programmed messages.
  - d) Logic circuitry to control the sequence of messages and flash rate.
- 4) Provide a serial interface that is capable of supporting complete remote control ability through land line and cellular telephone operation. Include communication software capable of immediately updating the message, providing complete sign status, and allowing message library queries and updates.
- 5) Allow a single person easily to raise the sign to a satisfactory height above the pavement during use, and lower the sign during travel.
- 6) Be Highway Orange on all exterior surfaces of the trailer, supports, and controller cabinet.
- 7) Provide operation in ambient temperatures from -30 to + 120 degrees Fahrenheit during snow, rain and other inclement weather.
- 8) Provide the driver board as part of a module. All modules are interchangeable, and have plug and socket arrangements for disconnection and reconnection. Printed circuit boards associated with driver boards have a conformable coating to protect against moisture.
- 9) Provide a sign case sealed against rain, snow, dust, insects, etc. The lens is UV stabilized clear plastic (polycarbonate, acrylic, or other approved material) angled to prevent glare.
- 10) Provide a flat black UV protected coating on the sign hardware, character PCB, and appropriate lens areas.
- 11) Provide a photocell control to provide automatic dimming.

- 12) Allow an on-off flashing sequence at an adjustable rate.
- 13) Provide a sight to aim the message.
- 14) Provide a LED display color of approximately 590 nm amber.
- 15) Provide a controller that is password protected.
- 16) Provide a security device that prevents unauthorized individuals from accessing the controller.
- 17) Provide the following 3-line messages preprogrammed and available for use when the sign unit begins operation:

/KEEP/RIGHT/=>=>=>/	/MIN/SPEED/**MPH/
/KEEP/LEFT/←←←/	/ICY/BRIDGE/AHEAD/ /ONE
/LOOSE/GRAVEL/AHEAD/	LANE/BRIDGE/AHEAD/
/RD WORK/NEXT/**MILES/	/ROUGH/ROAD/AHEAD/
/TWO WAY/TRAFFIC/AHEAD/	/MERGING/TRAFFIC/AHEAD/
/PAINT/CREW/AHEAD/	/NEXT/**/MILES/
/REDUCE/SPEED/**MPH/	/HEAVY/TRAFFIC/AHEAD/
/BRIDGE/WORK/**0 FT/	/SPEED/LIMIT/**MPH/
/MAX/SPEED/**MPH/	/BUMP/AHEAD/
/SURVEY/PARTY/AHEAD/	/TWO/WAY/TRAFFIC/

\*Insert numerals as directed by the Engineer.  
Add other messages during the project when required by the Engineer.

**2.3 Power.**

- 1) Design solar panels to yield 10 percent or greater additional charge than sign consumption. Provide direct wiring for operation of the sign or arrow board from an external power source to provide energy backup for 21 days without sunlight and an on-board system charger with the ability to recharge completely discharged batteries in 24 hours.

**3.0 CONSTRUCTION.** Furnish and operate the variable message signs as designated on the plans or by the Engineer. Ensure the bottom of the message panel is a minimum of 7 feet above the roadway in urban areas and 5 feet above in rural areas when operating. Use Class I, II, or III signs on roads with a speed limit less than 55 mph. Use Class I or II signs on roads with speed limits 55 mph or greater.

Maintain the sign in proper working order, including repair of any damage done by others, until completion of the project. When the sign becomes inoperative, immediately repair or replace the sign. Repetitive problems with the same unit will be cause for rejection and replacement.

Use only project related messages and messages directed by the Engineer, unnecessary messages lessen the impact of the sign. Ensure the message is displayed in either one or 2 phases with each phase having no more than 3 lines of text. When no message is needed, but it is necessary to know if the sign is operable, flash only a pixel.

When the sign is not needed, move it outside the clear zone or where the Engineer directs. Variable Message Signs are the property of the Contractor and shall be removed from the project when no longer needed. The Department will not assume ownership of these signs.

**4.0 MEASUREMENT.** The final quantity of Variable Message Sign will be

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the actual number of individual signs acceptably furnished and operated during the project. The Department will not measure signs replaced due to damage or rejection.

**5.0 PAYMENT.** The Department will pay for the Variable Message Signs at the unit price each. The Department will not pay for signs replaced due to damage or rejection. Payment is full compensation for furnishing all materials, labor, equipment, and service necessary to, operate, move, repair, and maintain or replace the variable message signs. The Department will make payment for the completed and accepted quantities under the following:

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
02671	Portable Changeable Message Sign	Each

Effective June 15, 2012

## **SPECIAL NOTE FOR TURF REINFORCING MAT**

**1.0 DESCRIPTION.** Install turf reinforcement mat at locations specified in the Contract or as the Engineer directs. Section references herein are to the Department's 2012 Standard Specifications for Road and Bridge Construction.

### **2.0 MATERIALS.**

**2.1 Turf Reinforcement Mat (TRM).** Use a Turf Reinforcement Mat defined as permanent rolled erosion control product composed of non-degradable synthetic fibers, filaments, nets, wire mesh and/or other elements, processed into a three-dimensional matrix of sufficient thickness and from the Department's List of Approved Materials. Mats must be 100% UV stabilized materials. For TRMs containing degradable components, all physical property values must be obtained on the non-degradable portion of the matting exclusively. Ensure product labels clearly show the manufacturer or supplier name, style name, and roll number. Ensure labeling, shipment and storage follows ASTM D-4873. The Department will require manufacturer to provide TRMs that are machine constructed web of mechanically or melt bonded nondegradable fibers entangled to form a three dimensional matrix. The Department will require all long term performance property values in table below to be based on non degradable portion of the matting alone. Approved methods include polymer welding, thermal or polymer fusion, or placement of fibers between two high strength biaxially oriented nets mechanically bound by parallel stitching with polyolefin thread. Ensure that mats designated in the plans as Type 4 mats, are not to be manufactured from discontinuous or loosely held together by stitching or glued netting or composites. Type 4 mats shall be composed of geosynthetic matrix that exhibits a very high interlock and reinforcement capacities with both soil and root systems and with high tensile modulus. The Department will require manufacturer to use materials chemically and biologically inert to the natural soil environments conditions. Ensure the blanket is smolder resistant without the use of chemical additives. When stored, maintain the protective wrapping and elevate the mats off the ground to protect them from damage. The Department will not specify these materials for use in heavily acidic coal seam areas or other areas with soil problems that would severally limit vegetation growth.

- A) Dimensions. Ensure TRMs are furnished in strips with a minimum width of 4 feet and length of 50 feet.
- B) Weight. Ensure that all mat types have a minimum mass per unit area of 7 ounces per square yard according to ASTM D 6566.
- C) Performance Testing: The Department will require AASHTO's NTPEP index testing. The Department will also require the manufacturer to perform internal MARV testing at a Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP) accredited laboratory for tensile strength, tensile elongation, mass per unit area, and thickness once every 24,000 yds of production or whatever rate is required to ensure 97.7% confidence under ASTM D4439& 4354. The Department will require Full scale testing for slope and channel applications shear stress shall be done under ASTM D 6459, ASTM D 6460-07 procedures.

### **2.2 Classifications**

The basis for selection of the type of mat required will be based on the long term shear stress level of the mat of the channel in question or the degree of slope to protect and will be designated in the contract. The Type 4 mats are to be used at structural backfills protecting critical



structures, utility cuts, areas where vehicles may be expected to traverse the mat, channels with large heavy drift, and where higher factors of safety, very steep slopes and/or durability concerns are needed as determined by project team and designer and will be specified in the plans by designer.

Turf Reinforcement Matting					
Properties <sup>1</sup>	Type 1	Type 2	Type 3	Type 4	Test Method
Minimum tensile Strength lbs/ft	125	150	175	3000 by 1500	ASTM D6818 <sup>2</sup>
UV stability (minimum % tensile retention)	80	80	80	90	ASTM D4355 <sup>3</sup> (1000-hr exposure)
Minimum thickness (inches)	0.25	0.25	0.25	0.40	ASTM D6525
Slopes applications	2H:1V or flatter	1.5H:1V or flatter	1H:1V or flatter	1 H: 1V or greater	
Shear stress lbs/ft <sup>2</sup> Channel applications	6.0 <sup>4</sup>	8.0 <sup>4</sup>	10.0 <sup>4</sup>	12.0 <sup>4</sup>	ASTM D6459 ASTM D6460-07

<sup>1</sup> For TRMs containing degradable components, all physical property values must be obtained on the non-degradable portion of the matting alone.

<sup>2</sup>Minimum Average Roll Values for tensile strength of sample material machine direction.

<sup>3</sup>Tensile Strength percentage retained after stated 1000 hr duration of exposure under ASTM D4355 testing. Based on nondegradable components exclusively.

<sup>4</sup>Maximum permissible shear design values based on short-term (0.5 hr) vegetated data obtained by full scale flume testing ASTM D6459, D6460-07. Based on nondegradable components exclusively. Testing will be done at Independent Hydraulics Facility such as Colorado State University hydraulics laboratory, Utah State University hydraulics laboratory, Texas Transportation Institute (TTI) hydraulics and erosion control laboratory.

### 2.3 Quality Assurance Sampling, Testing, and Acceptance

- A) Provide TRM listed on the Department’s List of Approved Materials. Prior to inclusion on the LAM, the manufacturer of TRM must meet the physical and performance criteria as outlined in the specification and submit a Letter Certifying compliance of the product under the above ASTM testing procedures and including a copy of report from Full Scale Independent Hydraulics Facility that Fully Vegetated Shear Stress meets shear stress requirements tested under D6459 and D6460-07.
- B) Contractors will provide a Letter of Certification from Manufacturer stating the product name, manufacturer, and that the product MARV product unit testing results meets Department criteria. Provide Letters once per project and for each product.
- C) Acceptance shall be in accordance with ASTM D-4759 based on testing performed by a Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP) accredited laboratory using Procedure A of ASTM D-4354.

Current mats meeting the above criteria are shown on the Department's List of Approved Materials.

**2.4 Fasteners.** When the mat manufacturer does not specify a specific fastener, use steel wire U-shaped staples with a minimum diameter of 0.09 inches (11 gauge), a minimum width of one inch and a minimum length of 12 inches. Use a heavier gauge when working in rocky or clay soils and longer lengths in sandy soils as directed by Engineer or Manufacturer's Representative. Provide staples with colored tops when requested by the Engineer.

**3.0 CONSTRUCTION.** When requested by the Engineer, provide a Manufacturer's Representative on-site to oversee and approve the initial installation of the mat. When requested by the Engineer, provide a letter from the Manufacturer approving the installation. When there is a conflict between the Department's criteria and the Manufacturer's criteria, construct using the more restrictive. The Engineer and Manufacturer's Representative must approve all alternate installation methods prior to execution. Construct according to the Manufacturer's recommendations and the following as minimum installation technique:

**3.1 Site Preparation.** Grade areas to be treated with matting and compact. Remove large rocks, soil clods, vegetation, roots, and other sharp objects that could keep the mat from intimate contact with subgrade. Prepare seedbed by loosening the top 2 to 3 inch of soil.

**3.2 Installation.** Install mats according to Standard Drawing Sepias "Turf Mat Channel Installation" and "Turf Mat Slope Installation." Install mats at the specified elevation and alignment. Anchor the mats with staples with a minimum length of 12 inches. Use longer anchors for installations in sandy, loose, or wet soils as directed by the Engineer or Manufacturer's Representative. The mat should be in direct contact with the soil surface.

**4.0 MEASUREMENT.** The Department will measure the quantity of Turf Reinforcement Mat by the square yard of surface covered. The Department will not measure preparation of the bed, providing a Manufacturer's Representative, topsoil, or seeding for payment and will consider them incidental to the Turf Reinforcement Mat. The Department will not measure any reworking of slopes or channels for payment as it is considered corrective work and incidental to the Turf Reinforcement Mat. Seeding and protection will be an incidental item.

**5.0 PAYMENT.** The Department will make payment for the completed and accepted quantities under the following:

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
23274EN11F	Turf Reinforcement Mat 1	Square Yard
23275EN11F	Turf Reinforcement Mat 2	Square Yard
23276EN11F	Turf Reinforcement Mat 3	Square Yard
23277EN11F	Turf Reinforcement Mat 4	Square Yard

June 15, 2012

## **PART III**

### **EMPLOYMENT, WAGE AND RECORD REQUIREMENTS**

**TRANSPORTATION CABINET  
DEPARTMENT OF HIGHWAYS**

**LABOR AND WAGE REQUIREMENTS  
APPLICABLE TO OTHER THAN FEDERAL-AID SYSTEM PROJECTS**

- I. Application
- II. Nondiscrimination of Employees (KRS 344)

**I. APPLICATION**

1. These contract provisions shall apply to all work performed on the contract by the contractor with his own organization and with the assistance of workmen under his immediate superintendence and to all work performed on the contract by piecework, station work or by subcontract. The contractor's organization shall be construed to include only workmen employed and paid directly by the contractor and equipment owned or rented by him, with or without operators.

2. The contractor shall insert in each of his subcontracts all of the stipulations contained in these Required Provisions and such other stipulations as may be required.

3. A breach of any of the stipulations contained in these Required Provisions may be grounds for termination of the contract.

3. If the contractor is in control of apprenticeship or other training or retraining, including on-the-job training programs, he shall not discriminate against an individual because of his race, color, religion, national origin, sex, disability or age forty (40) and over, in admission to, or employment in any program established to provide apprenticeship or other training.

4. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment. The contractor will take such action with respect to any subcontract or purchase order as the administrating agency may direct as a means of enforcing such provisions, including sanctions for non-compliance.

Revised: January 25, 2017

**II. NONDISCRIMINATION OF EMPLOYEES**

**AN ACT OF THE KENTUCKY  
GENERAL ASSEMBLY TO PREVENT  
DISCRIMINATION IN EMPLOYMENT  
KRS CHAPTER 344  
EFFECTIVE JUNE 16, 1972**

The contract on this project, in accordance with KRS Chapter 344, provides that during the performance of this contract, the contractor agrees as follows:

1. The contractor shall not fail or refuse to hire, or shall not discharge any individual, or otherwise discriminate against an individual with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's race, color, religion, national origin, sex, disability or age (forty and above); or limit, segregate, or classify his employees in any way which would deprive or tend to deprive an individual of employment opportunities or otherwise adversely affect his status as an employee, because of such individual's race, color, religion, national origin, sex, disability or age forty (40) and over. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. The contractor shall not print or publish or cause to be printed or published a notice or advertisement relating to employment by such an employer or membership in or any classification or referral for employment by the employment agency, indicating any preference, limitation, specification, or discrimination, based on race, color, religion, national origin, sex, or age forty (40) and over, or because the person is a qualified individual with a disability, except that such a notice or advertisement may indicate a preference, limitation, or specification based on religion, national origin, sex, or age forty (40) and over, or because the person is a qualified individual with a disability, when religion, national origin, sex, or age forty (40) and over, or because the person is a qualified individual with a disability, is a bona fide occupational qualification for employment.

## EXECUTIVE BRANCH CODE OF ETHICS

In the 1992 regular legislative session, the General Assembly passed and Governor Brereton Jones signed Senate Bill 63 (codified as KRS 11A), the Executive Branch Code of Ethics, which states, in part:

KRS 11A.040 (7) provides:

No present or former public servant shall, within six (6) months following termination of his office or employment, accept employment, compensation, or other economic benefit from any person or business that contracts or does business with, or is regulated by, the state in matters in which he was directly involved during the last thirty-six (36) months of his tenure. This provision shall not prohibit an individual from returning to the same business, firm, occupation, or profession in which he was involved prior to taking office or beginning his term of employment, or for which he received, prior to his state employment, a professional degree or license, provided that, for a period of six (6) months, he personally refrains from working on any matter in which he was directly involved during the last thirty-six (36) months of his tenure in state government. This subsection shall not prohibit the performance of ministerial functions, including but not limited to filing tax returns, filing applications for permits or licenses, or filing incorporation papers, nor shall it prohibit the former officer or public servant from receiving public funds disbursed through entitlement programs.

KRS 11A.040 (9) states:

A former public servant shall not represent a person or business before a state agency in a matter in which the former public servant was directly involved during the last thirty-six (36) months of his tenure, for a period of one (1) year after the latter of:

- a) The date of leaving office or termination of employment; or
- b) The date the term of office expires to which the public servant was elected.

This law is intended to promote public confidence in the integrity of state government and to declare as public policy the idea that state employees should view their work as a public trust and not as a way to obtain private benefits.

If you have worked for the executive branch of state government within the past six months, you may be subject to the law's prohibitions. The law's applicability may be different if you hold elected office or are contemplating representation of another before a state agency.

Also, if you are affiliated with a firm which does business with the state and which employs former state executive-branch employees, you should be aware that the law may apply to them.

In case of doubt, the law permits you to request an advisory opinion from the Executive Branch Ethics Commission, 3 Fountain Place, Frankfort, Kentucky 40601; telephone (502) 564-7954.

Revised: January 27, 2017

### **Kentucky Equal Employment Opportunity Act of 1978**

The requirements of the Kentucky Equal Employment Opportunity Act of 1978 (KRS 45.560-45.640) shall apply to this Contract. The apparent low Bidder will be required to submit EEO forms to the Division of Construction Procurement, which will then forward to the Finance and Administration Cabinet for review and approval. No award will become effective until all forms are submitted and EEO/CC has certified compliance. The required EEO forms are as follows:

- EEO-1: Employer Information Report
- Affidavit of Intent to Comply
- Employee Data Sheet
- Subcontractor Report

These forms are available on the Finance and Administration's web page under ***Vendor Information, Standard Attachments and General Terms*** at the following address:  
**<https://www.eProcurement.ky.gov>**.

Bidders currently certified as being in compliance by the Finance and Administration Cabinet may submit a copy of their approval letter in lieu of the referenced EEO forms.

For questions or assistance please contact the Finance and Administration Cabinet by email at **[finance.contractcompliance@ky.gov](mailto:finance.contractcompliance@ky.gov)** or by phone at 502-564-2874.

# EMPLOYEE RIGHTS UNDER THE FAIR LABOR STANDARDS ACT

THE UNITED STATES DEPARTMENT OF LABOR WAGE AND HOUR DIVISION

## FEDERAL MINIMUM WAGE

# \$7.25

 PER HOUR

BEGINNING JULY 24, 2009

### OVERTIME PAY

At least 1½ times your regular rate of pay for all hours worked over 40 in a workweek.

### CHILD LABOR

An employee must be at least **16** years old to work in most non-farm jobs and at least **18** to work in non-farm jobs declared hazardous by the Secretary of Labor.

Youths **14** and **15** years old may work outside school hours in various non-manufacturing, non-mining, non-hazardous jobs under the following conditions:

#### *No more than*

- **3** hours on a school day or **18** hours in a school week;
- **8** hours on a non-school day or **40** hours in a non-school week.

Also, work may not begin before **7 a.m.** or end after **7 p.m.**, except from June 1 through Labor Day, when evening hours are extended to **9 p.m.** Different rules apply in agricultural employment.

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### TIP CREDIT

Employers of “tipped employees” must pay a cash wage of at least \$2.13 per hour if they claim a tip credit against their minimum wage obligation. If an employee's tips combined with the employer's cash wage of at least \$2.13 per hour do not equal the minimum hourly wage, the employer must make up the difference. Certain other conditions must also be met.

### ENFORCEMENT

The Department of Labor may recover back wages either administratively or through court action, for the employees that have been underpaid in violation of the law. Violations may result in civil or criminal action.

Employers may be assessed civil money penalties of up to \$1,100 for each willful or repeated violation of the minimum wage or overtime pay provisions of the law and up to \$11,000 for each employee who is the subject of a violation of the Act's child labor provisions. In addition, a civil money penalty of up to \$50,000 may be assessed for each child labor violation that causes the death or serious injury of any minor employee, and such assessments may be doubled, up to \$100,000, when the violations are determined to be willful or repeated. The law also prohibits discriminating against or discharging workers who file a complaint or participate in any proceeding under the Act.

### ADDITIONAL INFORMATION

- Certain occupations and establishments are exempt from the minimum wage and/or overtime pay provisions.
- Special provisions apply to workers in American Samoa and the Commonwealth of the Northern Mariana Islands.
- Some state laws provide greater employee protections; employers must comply with both.
- The law requires employers to display this poster where employees can readily see it.
- Employees under 20 years of age may be paid \$4.25 per hour during their first 90 consecutive calendar days of employment with an employer.
- Certain full-time students, student learners, apprentices, and workers with disabilities may be paid less than the minimum wage under special certificates issued by the Department of Labor.

For additional information:



# 1-866-4-USWAGE

(1-866-487-9243)

TTY: 1-877-889-5627



# WWW.WAGEHOUR.DOL.GOV

U.S. Department of Labor | Wage and Hour Division

**PART IV**  
**INSURANCE**



## INSURANCE

The Contractor shall procure and maintain the following insurance in addition to the insurance required by law:

- 1) Commercial General Liability-Occurrence form – not less than \$2,000,000 General aggregate, \$2,000,000 Products & Completed Aggregate, \$1,000,000 Personal & Advertising, \$1,000,000 each occurrence.
- 2) Automobile Liability- \$1,000,000 per accident
- 3) Employers Liability:
  - a) \$100,000 Each Accident Bodily Injury
  - b) \$500,000 Policy limit Bodily Injury by Disease
  - c) \$100,000 Each Employee Bodily Injury by Disease
- 4) The insurance required above must be evidenced by a Certificate of Insurance and this Certificate of Insurance must contain one of the following statements:
  - a) "policy contains no deductible clauses."
  - b) "policy contains \_\_\_\_\_ (amount) deductible property damage clause but company will pay claim and collect the deductible from the insured."
- 5) KENTUCKY WORKMEN'S COMPENSATION INSURANCE. The contractor shall furnish evidence of coverage of all his employees or give evidence of self-insurance by submitting a copy of a certificate issued by the Workmen's Compensation Board.

The cost of insurance is incidental to all contract items. All subcontractors must meet the same minimum insurance requirements.

**PART V**  
**BID ITEMS**

### PROPOSAL BID ITEMS

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#### Section: 0001 - PAVING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00001		DGA BASE	318.00	TON		\$	
0020	00003		CRUSHED STONE BASE	2,936.00	TON		\$	
0030	00212		CL2 ASPH BASE 1.00D PG64-22	5,989.00	TON		\$	
0040	00307		CL2 ASPH SURF 0.38B PG64-22	761.00	TON		\$	
0050	00358		ASPHALT CURING SEAL	13.00	TON		\$	
0060	02676		MOBILIZATION FOR MILL & TEXT	1.00	LS		\$	
0070	02677		ASPHALT PAVE MILLING & TEXTURING	55.00	TON		\$	
0080	02702		SAND FOR BLOTTER	32.00	TON		\$	

#### Section: 0002 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0090	00078		CRUSHED AGGREGATE SIZE NO 2	100.00	TON		\$	
0100	01015		INSPECT & CERTIFY EDGE DRAIN SYSTEM	1.00	LS		\$	
0110	01810		STANDARD CURB AND GUTTER	3,538.00	LF		\$	
0120	01983		DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL YELLOW	22.00	EACH		\$	
0130	02014		BARRICADE-TYPE III	18.00	EACH		\$	
0140	02159		TEMP DITCH	6,003.00	LF		\$	
0150	02160		CLEAN TEMP DITCH	6,003.00	LF		\$	
0160	02200		ROADWAY EXCAVATION	3,220.00	CUYD		\$	
0170	02230		EMBANKMENT IN PLACE	41,881.00	CUYD		\$	
0180	02242		WATER (FOR DUST CONTROL)	28.00	MGAL		\$	
0190	02273		FENCE-4 FT CHAIN LINK	10.00	LF		\$	
0200	02397		TEMP GUARDRAIL	1,100.00	LF		\$	
0210	02429		RIGHT-OF-WAY MONUMENT TYPE 1	32.00	EACH		\$	
0220	02432		WITNESS POST	32.00	EACH		\$	
0230	02562		TEMPORARY SIGNS	128.00	SQFT		\$	
0240	02585		EDGE KEY	59.00	LF		\$	
0250	02597		FABRIC-GEOTEXTILE TYPE II	2,336.00	SQYD		\$	
0260	02599		FABRIC-GEOTEXTILE TYPE IV	12,294.00	SQYD		\$	
0270	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		\$	
0280	02651		DIVERSIONS (BY-PASS DETOURS) (COUNTY CLUB ENTRANCE)	1.00	LS		\$	
0290	02651		DIVERSIONS (BY-PASS DETOURS) (HOSPITAL ENTRANCE)	1.00	LS		\$	
0300	02653		LANE CLOSURE	1.00	EACH		\$	
0310	02671		PORTABLE CHANGEABLE MESSAGE SIGN	4.00	EACH		\$	
0320	02690		SAFELOADING	7.00	CUYD		\$	
0330	02701		TEMP SILT FENCE	6,003.00	LF		\$	
0340	02703		SILT TRAP TYPE A	3.00	EACH		\$	
0350	02704		SILT TRAP TYPE B	35.00	EACH		\$	
0360	02705		SILT TRAP TYPE C	28.00	EACH		\$	
0370	02706		CLEAN SILT TRAP TYPE A	3.00	EACH		\$	
0380	02707		CLEAN SILT TRAP TYPE B	3.00	EACH		\$	
0390	02708		CLEAN SILT TRAP TYPE C	3.00	EACH		\$	

### PROPOSAL BID ITEMS

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0400	02720		SIDEWALK-4 IN CONCRETE	1,858.00	SQYD		\$	
0410	02721		REMOVE CONCRETE SIDEWALK	355.00	SQYD		\$	
0420	02726		STAKING	1.00	LS		\$	
0430	02775		ARROW PANEL	2.00	EACH		\$	
0440	04939		REMOVE POLE	1.00	EACH		\$	
0450	05950		EROSION CONTROL BLANKET	3,537.00	SQYD		\$	
0460	05952		TEMP MULCH	37,772.00	SQYD		\$	
0470	05953		TEMP SEEDING AND PROTECTION	37,772.00	SQYD		\$	
0480	05963		INITIAL FERTILIZER	1.00	TON		\$	
0490	05964		20-10-10 FERTILIZER	1.00	TON		\$	
0500	05985		SEEDING AND PROTECTION	26,095.00	SQYD		\$	
0510	05989		SPECIAL SEEDING CROWN VETCH	3,000.00	SQYD		\$	
0520	05990		SODDING	1,284.00	SQYD		\$	
0530	05992		AGRICULTURAL LIMESTONE	16.00	TON		\$	
0540	06510		PAVE STRIPING-TEMP PAINT-4 IN	4,600.00	LF		\$	
0550	06514		PAVE STRIPING-PERM PAINT-4 IN	10,391.00	LF		\$	
0560	06515		PAVE STRIPING-PERM PAINT-6 IN	189.00	LF		\$	
0570	06530		PAVE STRIPING REMOVAL-4 IN	4,600.00	LF		\$	
0580	06551		PAVE STRIPING-TEMP REM TAPE-Y	4,600.00	LF		\$	
0590	06568		PAVE MARKING-THERMO STOP BAR-24IN	89.00	LF		\$	
0600	06574		PAVE MARKING-THERMO CURV ARROW	5.00	EACH		\$	
0610	10020NS		FUEL ADJUSTMENT	17,750.00	DOLL	\$1.00	\$	\$17,750.00
0620	10030NS		ASPHALT ADJUSTMENT	26,390.00	DOLL	\$1.00	\$	\$26,390.00
0630	20430ED		SAW CUT	230.00	LF		\$	
0640	21134ND		REMOVE-STORE AND REINSTALL SIGN	18.00	EACH		\$	
0650	23010EN		PAVE MARK TEMP PAINT STOP BAR-24 IN	32.00	LF		\$	
0660	23158ES505		DETECTABLE WARNINGS	46.00	SQFT		\$	
0670	23252ES717		PAVE MARK TY 1 TAPE STOP BAR-12 IN	12.00	LF		\$	
0680	23265ES717		PAVE MARK TY 1 TAPE STOP BAR-24 IN	20.00	LF		\$	

### Section: 0003 - DRAINAGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0690	00071		CRUSHED AGGREGATE SIZE NO 57	167.00	TON		\$	
0700	00440		ENTRANCE PIPE-15 IN	44.00	LF		\$	
0710	00522		STORM SEWER PIPE-18 IN	1,622.00	LF		\$	
0720	00524		STORM SEWER PIPE-24 IN	121.00	LF		\$	
0730	01005		PERFORATED PIPE EDGE DRAIN-4 IN	4,203.00	LF		\$	
0740	01010		NON-PERFORATED PIPE-4 IN	10.00	LF		\$	
0750	01024		PERF PIPE HEADWALL TY 2-4 IN	2.00	EACH		\$	
0760	01450		S & F BOX INLET-OUTLET-18 IN	8.00	EACH		\$	
0770	01451		S & F BOX INLET-OUTLET-24 IN	2.00	EACH		\$	
0780	01456		CURB BOX INLET TYPE A	15.00	EACH		\$	
0790	01577		DROP BOX INLET TYPE 14	1.00	EACH		\$	
0800	01740		CORED HOLE DRAINAGE BOX CON-4 IN	30.00	EACH		\$	
0810	02600		FABRIC GEOTEXTILE TY IV FOR PIPE	2,938.00	SQYD	\$2.00	\$	\$5,876.00
0820	08100		CONCRETE-CLASS A	3.00	CUYD		\$	
0830	08150		STEEL REINFORCEMENT	345.00	LB		\$	
0840	23174ED		PERFORATED PIPE HEADWALL-INSTALL	2.00	EACH		\$	

### PROPOSAL BID ITEMS

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0850	23274EN11F		TURF REINFORCEMENT MAT 1	323.00	SQYD		\$	

#### Section: 0004 - SEWER

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0860	15000		S BYPASS PUMPING	3.00	EACH		\$	
0870	15021		S ENCASEMENT STEEL OPEN CUT RANGE 2 (10-IN)	181.00	LF		\$	
0880	15023		S ENCASEMENT STEEL OPEN CUT RANGE 4 (16-IN)	44.00	LF		\$	
0890	15026		S FORCE MAIN AIR RLS/VAC VLV 02 IN	2.00	EACH		\$	
0900	15059		S FORCE MAIN PVC 04 INCH (SDR 21)	2,069.00	LF		\$	
0910	15073		S FORCE MAIN TIE-IN 04 INCH	3.00	EACH		\$	
0920	15092		S MANHOLE (4-FT DIA.)	3.00	EACH		\$	
0930	15097		S MANHOLE RECONSTRUCT INVERT	2.00	EACH		\$	
0940	15098		S MANHOLE SPECIAL (5-FT DIA.)	1.00	EACH		\$	
0950	15112		S PIPE PVC 08 INCH (GRAVITY, SDR 35)	455.00	LF		\$	
0960	15123		S LINE MARKER	6.00	EACH		\$	

#### Section: 0005 - SIGNALIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0970	04844		CABLE-NO. 14/5C	136.00	LF		\$	
0980	04885		MESSENGER-10800 LB	220.00	LF		\$	
0990	04932		INSTALL STEEL STRAIN POLE	4.00	EACH		\$	
1000	04950		REMOVE SIGNAL EQUIPMENT	1.00	EACH		\$	
1010	20408ES835		INSTALL LED BEACON-12 IN	8.00	EACH		\$	
1020	23157EN		TRAFFIC SIGNAL POLE BASE	18.00	CUYD		\$	
1030	24526ED		INSTALL-BEACON CONTROLLER-2 CIRCUIT	1.00	EACH		\$	

#### Section: 0006 - WATERLINE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1040	14003		W CAP EXISTING MAIN (8-IN)	4.00	EACH		\$	
1050	14016		W ENCASEMENT STEEL OPEN CUT RANGE 5	62.00	LF		\$	
1060	14019		W FIRE HYDRANT ASSEMBLY	2.00	EACH		\$	
1070	14060		W PIPE PVC 08 INCH (C900)	722.00	LF		\$	
1080	14062		W PIPE PVC 12 INCH (C900)	1,432.00	LF		\$	
1090	14089		W TAPPING SLEEVE AND VALVE SIZE 1	1.00	EACH		\$	
1100	14095		W TIE-IN 08 INCH	1.00	EACH		\$	
1110	14097		W TIE-IN 12 INCH	1.00	EACH		\$	

**PROPOSAL BID ITEMS**

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1120	14106		W VALVE 08 INCH	1.00	EACH		\$	
1130	14108		W VALVE 12 INCH	2.00	EACH		\$	
1140	14120		W VALVE CUT-IN 12 INCH	1.00	EACH		\$	
1150	14144		W LINE MARKER	3.00	EACH		\$	
1160	14145		W SERV COPPER LONG SIDE 1 IN	1.00	EACH		\$	
1170	14149		W SERV COPPER SHORT SIDE 1 IN	5.00	EACH		\$	
1180	14151		W SERV COPPER SHORT SIDE 2 IN	1.00	EACH		\$	

**Section: 0007 - DEMOBILIZATION &/OR MOBILIZATION**

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1190	02568		MOBILIZATION	1.00	LS		\$	
1200	02569		DEMOBILIZATION	1.00	LS		\$	