



CALL NO. 108

CONTRACT ID. 151263

SIMPSON COUNTY

FED/STATE PROJECT NUMBER STPR 1001 (024)

DESCRIPTION NASHVILLE ROAD (US 31W)

WORK TYPE GRADE & DRAIN WITH ASPHALT SURFACE

PRIMARY COMPLETION DATE 180 WORKING DAYS

LETTING DATE: October 23,2015

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 AM EASTERN DAYLIGHT TIME October 23,2015. Bids will be publicly announced at 10:00 AM EASTERN DAYLIGHT TIME.

PLANS AVAILABLE FOR THIS PROJECT.

DBE CERTIFICATION REQUIRED - 5%

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

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PART I
SCOPE OF WORK

ADMINISTRATIVE DISTRICT - 03

CONTRACT ID - 151263

STPR 1001 (024)

COUNTY - SIMPSON

PCN - DE107031W1563

STPR 1001 (024)

NASHVILLE ROAD (US 31W) (MP 2.732) US-31W SECTION 3B: THREE LANE WIDENING FROM NORTH OF I-65 INTERCHANGE TO WALMART/LOEWS AT FRANKLIN (MP 4.400), A DISTANCE OF 01.90 MILES.GRADE & DRAIN WITH ASPHALT SURFACE SYP NO. 03-00008.32.

GEOGRAPHIC COORDINATES LATITUDE 36:41:16.00 LONGITUDE 86:34:07.00

COMPLETION DATE(S):

60 CALENDAR DAYS	INTERMEDIATE MILESTONE - DIVERSION
180 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)

The Bidder must download the bid file located on the Bid Express website (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 is advised that the Underground Facility Damage Protection Act of 1994, became law January 1, 1995. It is the contractor's responsibility to determine the impact of the act regarding this project, and take all steps necessary to be in compliance with the provision of the act.

SPECIAL NOTE FOR COMPOSITE OFFSET BLOCKS

Contrary to the Standard Drawings (2012 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. 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). 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. (See attachment)

10/29/12



Steven L. Beshear
Governor

Commonwealth of Kentucky
Finance and Administration Cabinet
OFFICE OF THE SECRETARY
Room 383, Capitol Annex
702 Capital Avenue
Frankfort, KY 40601-3462
(502) 564-4240
Fax (502) 564-6785

Lori H. Flanery
Secretary

SECRETARY'S ORDER 11-004

FINANCE AND ADMINISTRATION CABINET

Vendor Document Disclosure

WHEREAS, in order to promote accountability and transparency in governmental operations, the Finance and Administration Cabinet believes that a mechanism should be created which would provide for review and assistance to an Executive Branch agency if said agency cannot obtain access to documents that it deems necessary to conduct a review of the records of a private vendor that holds a contract to provide goods and/or services to the Commonwealth; and

WHEREAS, in order to promote accountability and transparency in governmental operations, the Finance and Administration Cabinet believes that a mechanism should be created which would provide for review and assistance to an Executive Branch agency if said agency cannot obtain access to documents that it deems necessary during the course of an audit, investigation or any other inquiry by an Executive Branch agency that involves the review of documents; and

WHEREAS, KRS 42.014 and KRS 12.270 authorizes the Secretary of the Finance and Administration Cabinet to establish the internal organization and assignment of functions which are not established by statute relating to the Finance and Administration Cabinet; further, KRS Chapter 45A.050 and 45A.230 authorizes the Secretary of the Finance and Administration Cabinet to procure, manage and control all supplies and services that are procured by the Commonwealth and to intervene in controversies among vendors and state agencies; and

NOW, THEREFORE, pursuant to the authority vested in me by KRS 42.014, KRS 12.270, KRS 45A.050, and 45A.230, I, Lori H. Flanery, Secretary of the Finance and Administration Cabinet, do hereby order and direct the following:

- I. Upon the request of an Executive Branch agency, the Finance and Administration Cabinet ("FAC") shall formally review any dispute arising where the agency has requested documents from a private vendor that holds a state contract and the vendor has refused access to said documents under a claim that said documents are not directly pertinent or relevant to the agency's inquiry upon which the document request was predicated.
- II. Upon the request of an Executive Branch agency, the FAC shall formally review any situation where the agency has requested documents that the agency deems necessary to

conduct audits, investigations or any other formal inquiry where a dispute has arisen as to what documents are necessary to conclude the inquiry.

- III. Upon receipt of a request by a state agency pursuant to Sections I & II, the FAC shall consider the request from the Executive Branch agency and the position of the vendor or party opposing the disclosure of the documents, applying any and all relevant law to the facts and circumstances of the matter in controversy. After FAC's review is complete, FAC shall issue a Determination which sets out FAC's position as to what documents and/or records, if any, should be disclosed to the requesting agency. The Determination shall be issued within 30 days of receipt of the request from the agency. This time period may be extended for good cause.
- IV. If the Determination concludes that documents are being wrongfully withheld by the private vendor or other party opposing the disclosure from the state agency, the private vendor shall immediately comply with the FAC's Determination. Should the private vendor or other party refuse to comply with FAC's Determination, then the FAC, in concert with the requesting agency, shall effectuate any and all options that it possesses to obtain the documents in question, including, but not limited to, jointly initiating an action in the appropriate court for relief.
- V. Any provisions of any prior Order that conflicts with the provisions of this Order shall be deemed null and void.

FEDERAL CONTRACT NOTES

The Kentucky Department of Highways, in accordance with the Regulations of the United States Department of Transportation 23 CFR 635.112 (h), hereby notifies all bidders that failure by a bidder to comply with all applicable sections of the current Kentucky Standard Specifications, including, but not limited to the following, may result in a bid not being considered responsive and thus not eligible to be considered for award:

102.02 Current Capacity Rating 102.10 Delivery of Proposals
102.08 Irregular Proposals 102.14 Disqualification of Bidders
102.09 Proposal Guaranty

CIVIL RIGHTS ACT OF 1964

The Kentucky Department of Highways, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252) and the Regulations of the Federal Department of Transportation (49 C.F.R., Part 21), issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that the contract entered into pursuant to this advertisement will be awarded to the lowest responsible bidder without discrimination on the ground of race, color, or national origin.

NOTICE TO ALL BIDDERS

To report bid rigging activities call: 1-800-424-9071.

The U.S. Department of Transportation (DOT) operates the above toll-free "hotline" Monday through Friday, 8:00 a.m. to 5:00 p.m. eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report such activities.

The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

SECOND TIER SUBCONTRACTS

Second Tier subcontracts on federally assisted projects shall be permitted. However, in the case of DBE's, second tier subcontracts will only be permitted where the other subcontractor is also a DBE. All second tier subcontracts shall have the consent of both the Contractor and the Engineer.

DISADVANTAGED BUSINESS ENTERPRISE PROGRAM

It is the policy of the Kentucky Transportation Cabinet (“the Cabinet”) that Disadvantaged Business Enterprises (“DBE”) shall have the opportunity to participate in the performance of highway construction projects financed in whole or in part by Federal Funds in order to create a level playing field for all businesses who wish to contract with the Cabinet. To that end, the Cabinet will comply with the regulations found in 49 CFR Part 26, and the definitions and requirements contained therein shall be adopted as if set out verbatim herein.

The Cabinet, contractors, subcontractors, and sub-recipients shall not discriminate on the basis of race, color, national origin, or sex in the performance of work performed pursuant to Cabinet contracts. The contractor shall carry out applicable requirements of 49 CFR 26 in the award and administration of federally assisted highway construction projects. The contractor will include this provision in all its subcontracts and supply agreements pertaining to contracts with the Cabinet.

Failure by the contractor to carry out these requirements is a material breach of its contract with the Cabinet, which may result in the termination of the contract or such other remedy as the Cabinet deems necessary.

DBE GOAL

The Disadvantaged Business Enterprise (DBE) goal established for this contract, as listed on the front page of the proposal, is the percentage of the total value of the contract.

The contractor shall exercise all necessary and reasonable steps to ensure that Disadvantaged Business Enterprises participate in a least the percent of the contract as set forth above as goals for this contract.

OBLIGATION OF CONTRACTORS

Each contractor prequalified to perform work on Cabinet projects shall designate and make known to the Cabinet a liaison officer who is assigned the responsibility of effectively administering and promoting an active program for utilization of DBEs.

If a formal goal has not been designated for the contract, all contractors are encouraged to consider DBEs for subcontract work as well as for the supply of material and services needed to perform this work.

Contractors are encouraged to use the services of banks owned and controlled by minorities and women.

CERTIFICATION OF CONTRACT GOAL

Contractors shall include the following certification in bids for projects for which a DBE goal has been established. BIDS SUBMITTED WHICH DO NOT INCLUDE CERTIFICATION OF DBE PARTICIPATION WILL NOT BE ACCEPTED. These bids will not be considered for award by the Cabinet and they will be returned to the bidder.

“The bidder certifies that it has secured participation by Disadvantaged Business Enterprises (“DBE”) in the amount of ____ percent of the total value of this contract and that the DBE participation is in compliance with the requirements of 49 CFR 26 and the policies of the Kentucky Transportation Cabinet pertaining to the DBE Program.”

The certification statement is located in the electronic bid file. All contractors must certify their DBE participation on that page. DBEs utilized in achieving the DBE goal must be certified and prequalified for the work items at the time the bid is submitted.

DBE PARTICIPATION PLAN

Lowest responsive bidders must submit the *DBE Plan/ Subcontractor Request*, form TC 14-35 DBE, within 7 days of the letting. This is necessary before the Awards Committee will review and make a recommendation. **The project will not be considered for award prior to submission and approval of the apparent low bidder’s DBE Plan/Subcontractor Request.**

The DBE Participation Plan shall include the following:

- 1 Name and address of DBE Subcontractor(s) and/or supplier(s) intended to be used in the proposed project;
- 2 Description of the work each is to perform including the work item , unit, quantity, unit price and total amount of the work to be performed by the individual DBE. The Project Code Number (PCN), Category Number, and the Project Line Number can be found in the “material listing” on the Construction Procurement website under the specific letting;
- 3 The dollar value of each proposed DBE subcontract and the percentage of total project contract value this represents. DBE participation may be counted as follows; a) If DBE suppliers and manufactures assume actual and contractual responsibility, the dollar value of materials to be furnished will be counted toward the goal as follows:
 - The entire expenditure paid to a DBE manufacturer;
 - 60 percent of expenditures to DBE suppliers that are not manufacturers provided the supplier is a regular dealer in the product involved. A regular dealer must be engaged in, as its principal business and in its own name, the sale of products to

- the public, maintain an inventory and own and operate distribution equipment;
and
- The amount of fees or commissions charged by the DBE firms for a bona fide service, such as professional, technical, consultant, or managerial services and assistance in the procurement of essential personnel, facilities, equipment, materials, supplies, delivery of materials and supplies or for furnishing bonds, or insurance, providing such fees or commissions are determined to be reasonable and customary.
- b) The dollar value of services provided by DBEs such as quality control testing, equipment repair and maintenance, engineering, staking, etc.;
- c) The dollar value of joint ventures. DBE credit for joint ventures will be limited to the dollar amount of the work actually performed by the DBE in the joint venture;
- 4 Written and signed documentation of the bidder's commitment to use a DBE contractor whose participation is being utilized to meet the DBE goal; and
- 5 Written and signed confirmation from the DBE that it is participating in the contract as provided in the prime contractor's commitment.

UPON AWARD AND BEFORE A WORK ORDER WILL BE ISSUED

Contractors must submit the signed subcontract between the contractor and the DBE contractor, the DBE's certificate of insurance, and an affidavit for bidders, offerors, and contractors from the DBE to the Division of Construction Procurement. The affidavit can be found on the Construction Procurement website. If the DBE is a supplier of materials for the project, a signed purchase order and an affidavit for bidders, offerors, and contractors must be submitted to the Division of Construction Procurement.

Changes to DBE Participation Plans must be approved by the Cabinet. The Cabinet may consider extenuating circumstances including, but not limited to, changes in the nature or scope of the project, the inability or unwillingness of a DBE to perform the work in accordance with the bid, and/or other circumstances beyond the control of the prime contractor.

CONSIDERATION OF GOOD FAITH EFFORTS REQUESTS

If the DBE participation submitted in the bid by the apparent lowest responsive bidder does not meet or exceed the DBE contract goal, the apparent lowest responsive bidder must submit a Good Faith Effort Package to satisfy the Cabinet that sufficient good faith efforts were made to meet the contract goals prior to submission of the bid. Efforts to increase the goal after bid submission will not be considered in justifying the good faith effort, unless the contractor can show that the proposed DBE was solicited prior to the letting date. DBEs utilized in achieving the DBE goal must be certified and prequalified for the work items at the time the bid is submitted. One complete set and nine (9) copies of this information must be received in the

office of the Division of Contract Procurement no later than 12:00 noon of the tenth calendar day after receipt of notification that they are the apparent low bidder.

Where the information submitted includes repetitious solicitation letters it will be acceptable to submit a sample representative letter along with a distribution list of the firms solicited. Documentation of DBE quotations shall be a part of the good faith effort submittal as necessary to demonstrate compliance with the factors listed below which the Cabinet considers in judging good faith efforts. This documentation may include written subcontractors' quotations, telephone log notations of verbal quotations, or other types of quotation documentation.

The Good Faith Effort Package shall include, but may not be limited to information showing evidence of the following:

- 1 Whether the bidder attended any pre-bid meetings that were scheduled by the Cabinet to inform DBEs of subcontracting opportunities;
- 2 Whether the bidder provided solicitations through all reasonable and available means;
- 3 Whether the bidder provided written notice to all DBEs listed in the DBE directory at the time of the letting who are prequalified in the areas of work that the bidder will be subcontracting;
- 4 Whether the bidder followed up initial solicitations of interest by contacting DBEs to determine with certainty whether they were interested. If a reasonable amount of DBEs within the targeted districts do not provide an intent to quote or no DBEs are prequalified in the subcontracted areas, the bidder must notify the DBE Liaison in the Office of Minority Affairs to give notification of the bidder's inability to get DBE quotes;
- 5 Whether the bidder selected portions of the work to be performed by DBEs in order to increase the likelihood of meeting the contract goals. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime contractor might otherwise perform these work items with its own forces;
- 6 Whether the bidder provided interested DBEs with adequate and timely information about the plans, specifications, and requirements of the contract;
- 7 Whether the bidder negotiated in good faith with interested DBEs not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached;
- 8 Whether quotations were received from interested DBE firms but were rejected as unacceptable without sound reasons why the quotations were considered unacceptable. The fact that the DBE firm's quotation for the work is not the lowest quotation received will not in itself be considered as a sound reason for rejecting the quotation as unacceptable. The fact that the bidder has the ability and/or desire to perform the contract work with its own forces will not be considered a sound reason for rejecting a DBE quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy DBE goals;
- 9 Whether the bidder specifically negotiated with subcontractors to assume part of the responsibility to meet the contract DBE goal when the work to be subcontracted includes potential DBE participation;
- 10 Whether the bidder made any efforts and/or offered assistance to interested DBEs in obtaining the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the

work requirements of the bid proposal; and

11 Any other evidence that the bidder submits which may show that the bidder has made reasonable good faith efforts to include DBE participation.

FAILURE TO MEET GOOD FAITH REQUIREMENT

Where the apparent lowest responsive bidder fails to submit sufficient participation by DBE firms to meet the contract goal and upon a determination by the Good Faith Committee based upon the information submitted that the apparent lowest responsive bidder failed to make sufficient reasonable efforts to meet the contract goal, the bidder will be offered the opportunity to meet in person for administrative reconsideration. The bidder will be notified of the Committee's decision within 24 hours of its decision. The bidder will have 24 hours to request reconsideration of the Committee's decision. The reconsideration meeting will be held within two days of the receipt of a request by the bidder for reconsideration.

The request for reconsideration will be heard by the Office of the Secretary. The bidder will have the opportunity to present written documentation or argument concerning the issue of whether it met the goal or made an adequate good faith effort. The bidder will receive a written decision on the reconsideration explaining the basis for the finding that the bidder did or did not meet the goal or made adequate Good Faith efforts to do so.

The result of the reconsideration process is not administratively appealable to the Cabinet or to the United States Department of Transportation.

The Cabinet reserves the right to award the contract to the next lowest responsive bidder or to rebid the contract in the event that the contract is not awarded to the low bidder as the result of a failure to meet the good faith requirement.

SANCTIONS FOR FAILURE TO MEET DBE REQUIREMENTS OF THE PROJECT

Failure by the prime contractor to fulfill the DBE requirements of a project under contract or to demonstrate good faith efforts to meet the goal constitutes a breach of contract. When this occurs, the Cabinet will hold the prime contractor accountable, as would be the case with all other contract provisions. Therefore, the contractor's failure to carry out the DBE contract requirements shall constitute a breach of contract and as such the Cabinet reserves the right to exercise all administrative remedies at its disposal including, but not limited to the following:

- Disallow credit toward the DBE goal;
- Withholding progress payments;
- Withholding payment to the prime in an amount equal to the unmet portion of the contract goal; and/or
- Termination of the contract.

PROMPT PAYMENT

The prime contractor will be required to pay the DBE within seven (7) working days after he or she has received payment from the Kentucky Transportation Cabinet for work performed or materials furnished.

CONTRACTOR REPORTING

All contractors must keep detailed records and provide reports to the Cabinet on their progress in meeting the DBE requirement on any highway contract. These records may include, but shall not be limited to payroll, lease agreements, cancelled payroll checks, executed subcontracting agreements, etc. Prime contractors will be required to submit certified reports on monies paid to each DBE subcontractor or supplier utilized to meet a DBE goal. **These reports must be submitted within 14 days of payment made to the DBE contractor.**

Payment information that needs to be reported includes date the payment is sent to the DBE, check number, Contract ID, amount of payment and the check date. Before Final Payment is made on this contract, the Prime Contractor will certify that all payments were made to the DBE subcontractor and/or DBE suppliers.

The Prime Contractor should supply the payment information at the time the DBE is compensated for their work. Form to use is located at:

<http://transportation.ky.gov/Construction/Pages/Subcontracts.aspx>

The prime contractor should notify the KYTC Office of Civil Rights and Small Business Development seven (7) days prior to DBE contractors commencing work on the project. The contact is Melvin Bynes and the telephone number is (502) 564-3601.

Photocopied payments and completed form to be submitted to: Office of Civil Rights and Small Business Development 6th Floor West 200 Mero Street Frankfort, KY 40622

DEFAULT OR DECERTIFICATION OF THE DBE

If the DBE subcontractor or supplier is decertified or defaults in the performance of its work, and the overall goal cannot be credited for the uncompleted work, the prime contractor may utilize a substitute DBE or elect to fulfill the DBE goal with another DBE on a different work item. If after exerting good faith effort in accordance with the Cabinet's Good Faith Effort policies and procedures, the prime contractor is unable to replace the DBE, then the unmet portion of the goal may be waived at the discretion of the Cabinet.

04/29/2015

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 A

Be advised that the Department will accept compaction of asphalt mixtures furnished for driving lanes and ramps, at 1 inch (25mm) or greater, on this project according to OPTION A in accordance with Section 402 and Section 403 of the current Standard Specifications. The Department will require joint cores as described in Section 402.03.02 for surface mixtures only. The Department will accept compaction of all other asphalt mixtures according to OPTION B.

MATERIAL TRANSFER VEHICLE (MTV)

Provide and use a MTV in accordance with Sections 403.02.10 and 403.03.05.

SPECIAL NOTE

For Tree Removal

**Simpson County
US-31W three lane widening
Item No. 3-0008.32**

NO CLEARING OF TREES 3 INCHES OR GREATER (DIAMETER BREAST
HEIGHT) FROM APRIL 1 - OCTOBER 14.

**If there are any questions regarding this note, please contact David Waldner,
Director, Division of Environmental Analysis, 200 Mero Street, Frankfort, KY
40601, Phone: (502) 564-7250.**

**SPECIAL NOTE FOR
GUARDRAIL END TREATMENT TYPE 1**

Contrary to KYTC Standard Drawing RBR-020-05 the guardrail end treatment ET-Plus manufactured by Trinity Industries will not be permitted as an option for bid item “Guardrail End Treatment Type 1”.

SPECIAL NOTE FOR PIPELINE INSPECTION

1.0 DESCRIPTION. The Department will perform visual inspections on all pipe on the project. A video inspection will be required on projects having more than 250 linear feet of storm sewer and/or culvert pipe and on routes with an ADT of greater than 1,000 vehicles. Conduct video inspections on all pipe located under the roadway and 50 percent of the remaining pipe not under the roadway. Storm sewer runs and outfall pipes not under the roadway take precedence over rural entrance pipes. Contractors performing this item of work must be prequalified with the Department in the work type J51 (Video Pipe Inspection and Cleaning). Deflection testing shall be completed using a mandrel in accordance with the procedure outlined below or by physical measurement for pipes greater than 36 inches in diameter. Mandrel testing for deflection must be completed prior to the video inspection testing. Unless otherwise noted, Section references herein are to the Department's 2012 Standard Specifications for Road and Bridge Construction.

2.0 VIDEO INSPECTION. Ensure pipe is clear of water, debris or obstructions. Complete the video inspection and any necessary measurement prior to placing the final surface over any pipe. When paving will not be delayed, take measurements 30 days or more after the completion of earthwork to within 1 foot of the finished subgrade. Notify the Engineer a minimum of 24 hours in advance of inspection and notify the Engineer immediately if distresses or locations of improper installation are logged.

2.1 INSPECTION FOR DEFECTS AND DISTRESSES

A) Begin at the outlet end and proceed through to the inlet at a speed less than or equal to 30 ft/minute. Remove blockages that will prohibit a continuous operation.

B) Document locations of all observed defects and distresses including but not limited to: cracking, spalling, slabbing, exposed reinforcing steel, sags, joint offsets, joint separations, deflections, improper joints/connections, blockages, leaks, rips, tears, buckling, deviation from line and grade, damaged coatings/paved inverts, and other anomalies not consistent with a properly installed pipe.

C) During the video inspection provide a continuous 360 degree pan of every pipe joint.

D) Identify and measure all cracks greater than 0.1" and joint separations greater than 0.5".

E) Video Inspections are conducted from junction to junction which defines a pipe run. A junction is defined as a headwall, drop box inlet, curb box inlet, manhole, buried junction, or other structure that disturbs the continuity of the pipe. Multiple pipe inspections may be conducted from a single set up location, but each pipe run must be on a separate video file and all locations are to be referenced from nearest junction relative to that pipe run.

F) Record and submit all data on the TC 64-765 and TC 64-766 forms.

3.0 MANDREL TESTING. Mandrel testing will be used for deflection testing. For use on Corrugated Metal Pipe, High Density Polyethylene Pipe, and Polyvinyl Chloride Pipe,

use a mandrel device with an odd number of legs (9 minimum) having a length not less than the outside diameter of the mandrel. The diameter of the mandrel at any point shall not be less than the diameter specified in Section 3.6. Mandrels can be a fixed size or a variable size.

3.1 Use a proving ring or other method recommended by the mandrel manufacturer to verify mandrel diameter prior to inspection. Provide verification documentation for each size mandrel to the Engineer.

3.2 All deflection measurements are to be based off of the AASHTO Nominal Diameters. Refer to the chart in section 3.6.

3.3 Begin by using a mandrel set to the 5.0% deflection limit. Place the mandrel in the inlet end of the pipe and pull through to the outlet end. If resistance is met prior to completing the entire run, record the maximum distance achieved from the inlet side, then remove the mandrel and continue the inspection from the outlet end of the pipe toward the inlet end. Record the maximum distance achieved from the outlet side.

3.4 If no resistance is met at 5.0% then the inspection is complete. If resistance occurred at 5.0% then repeat 3.1 and 3.2 with the mandrel set to the 10.0% deflection limit. If the deflection of entire pipe run cannot be verified with the mandrel then immediately notify the Engineer.

3.5 Care must be taken when using a mandrel in all pipe material types and lining/coating scenarios. Pipe damaged during the mandrel inspection will be video inspected to determine the extent of the damage. If the damaged pipe was video inspected prior to mandrel inspection then a new video inspection is warranted and supersedes the first video inspection. Immediately notify the Engineer of any damages incurred during the mandrel inspection and submit a revised video inspection report.

3.6 AASHTO Nominal Diameters and Maximum Deflection Limits.

Base Pipe Diameter (inches)	AASHTO Nominal Diameter (inches)	Max. Deflection Limit (inches)	
		5.0%	10.0%
15	14.76	14.02	13.28
18	17.72	16.83	15.95
24	23.62	22.44	21.26
30	29.53	28.05	26.58
36	35.43	33.66	31.89
42	41.34	39.27	37.21
48	47.24	44.88	42.52
54	53.15	50.49	47.84
60	59.06	56.11	53.15

4.0 PHYSICAL MEASUREMENT OF PIPE DEFLECTION. Alternate method for deflection testing when there is available access or the pipe is greater than 36 inches in diameter, as per 4.1. Use a contact or non-contact distance instrument. A leveling device is recommended for establishing or verifying vertical and horizontal control.

4.1 Physical measurements may be taken after installation and compared to the AASHTO Nominal Diameter of the pipe as per Section 3.6. When this method is used, determine the smallest interior diameter of the pipe as measured through the center point of the pipe (D2). All measurements are to be taken from the inside crest of the corrugation. Take the D2 measurements at the most deflected portion of the pipe run in question and at intervals no greater than ten (10) feet through the run. Calculate the deflection as follows:

$$\% \text{ Deflection} = [(AASHTO \text{ Nominal Diameter} - D2) / AASHTO \text{ Nominal Diameter}] \times 100\%$$

Note: The Engineer may require that preset monitoring points be established in the culvert prior to backfilling. For these points the pre-installation measured diameter (D1) is measured and recorded. Deflection may then be calculated from the following formula:

$$\% \text{ Deflection} = [(D1 - D2) / D1] (100\%)$$

4.2 Record and submit all data.

5.0 DEDUCTION SCHEDULE. All pipe deductions shall be handled in accordance with the tables shown below.

FLEXIBLE PIPE DEFLECTION	
Amount of Deflection (%)	Payment
0.0 to 5.0	100% of the Unit Bid Price
5.1 to 9.9	50% of the Unit Bid Price ⁽¹⁾
10 or greater	Remove and Replace ⁽²⁾

⁽¹⁾ Provide Structural Analysis for HDPE and metal pipe. Based on the structural analysis, pipe may be allowed to remain in place at the reduced unit price. ⁽²⁾ The Department may allow the pipe to remain in place with no pay to the Contractor in instances where it is in the best interest to the public and where the structural analysis demonstrates that the pipe should function adequately.

RIGID PIPE REMEDIATION TABLE PIPE	
Crack Width (inches)	Payment
≤ 0.1	100% of the Unit Bid Price
Greater than 0.1	Remediate or Replace ⁽¹⁾

⁽¹⁾ Provide the Department in writing a method for repairing the observed cracking. Do not begin work until the method has been approved.

6.0 PAYMENT. The Department will measure the quantity in linear feet of pipe to inspect. 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>
24814EC	Pipeline Inspection	Linear Foot
10065NS	Pipe Deflection Deduction	Dollars

**METHOD OF HANDLING, TRANSPORTATION, AND
DISPOSAL OF ASBESTOS CEMENT WATER MAINS
SIMPSON COUNTY
FD52 107 65619 01 U
US-31W, TENNESSEE STATE LINE – FRANKLIN ROAD
ITEM NO. 3-8.32**

All handling, transportation and disposal of asbestos cement pipe shall be in strict accordance with Kentucky Occupational Safety and Health Standards for General Industry, 29 CFR part 1910 as adopted by 803 KAR 2.020 with amendments as of July 31, 1996 and all addenda and revisions to date and the Kentucky Occupational and Health Standards for the Construction Industry, 20 CFR part 1926 as adopted by 793 KRD 2.030 with amendments as of August 31, 1986 and all addenda and revisions to date. A certified asbestos remover/handler (certified by the State of Kentucky) shall be present at all times in the handling, transportation and disposal of asbestos. The Unit Bid price per linear foot of Asbestos Cement Pipe Removal shall include handling, transportation and disposal of asbestos cement pipe.

HAZARDOUS MATERIAL CAUTION NOTE

8” and 10” water mains that will be abandoned by the Simpson County Water District along US 31-W at various locations between approximate Mainline Station 159+50 and approximate Mainline Station 245+00 are asbestos cement water mains. Asbestos cement is considered a hazardous material when being disturbed and/or removed. Removal and disposal of portions of the asbestos cement water mains may be required during the construction phase of this project by the roadway contractor. For reference to method of handling, transportation and disposal of asbestos cement, see Special Note for Removal of Existing Asbestos Cement Pipe (attached). Listed below are approximate locations, sizes and quantities of asbestos cement water mains that may require removal and disposal.

SIZE:	LOCATIONS ON MAINLINE:	LINEAR FEET:
8” ACP W.M	Rt. of Sta. 243+00 to Rt. of Sta. 245+00	200 L.F.
8” ACP W.M.	Mainline Crossing at Sta. 228+30	50 L.F.
8” ACP W.M.	Lt. of Sta. 159+50 to Lt. of Sta. 160+50	200 L.F.
8” ACP W.M.	Lt. of Sta. 163+00 to Lt. of Sta. 164+00	100 L.F.
8” ACP W.M.	Lt of Sta. 175+00 to Lt. of Sta. 176+00	100 L.F.
8” ACP W.M.	Lt of Sta. 211+00 to Lt. of Sta. 212+50	150 L.F.
8” ACP W.M.	Lt of Sta. 218+50 to Lt. of Sta. 220+00	150 L.F.

Estimated Total: 950 L.F.

SPECIAL NOTE FOR REMOVAL OF EXISTING ASBESTOS CEMENT PIPE

I. DESCRIPTION

This special note covers requirements that apply when the contract requires removal and disposal of existing asbestos cement pipe by the Contractor.

II. REQUIREMENTS

A. General. All handling, transportation and disposal of asbestos cement pipe shall be in strict accordance with the Kentucky Occupational Safety and Health Standards for General Industry, 29 CFR part 1910 as adopted by 803 KAR 2.020 with amendments as of July 31, 1986 and all addenda and revisions to date and the Kentucky Occupational and Health Standards for the Construction Industry, 29 CFR part 1926 as adopted by 793 KAR 2.030 with amendments as of August 31, 1986 and all addenda and revisions to date.

All work shall be accomplished in accordance with the requirements of all applicable federal laws and regulations covering asbestos abatement, and as specified in 401 KAR 63:042.

The Contractor shall also comply with the applicable standards and regulations of any local government agency that may be applicable.

Removal shall be supervised by an asbestos abatement entity certified by the Kentucky Natural Resources and Environmental Protection Cabinet. Disposal shall be accomplished by a KNREPC registered transporter.

Any asbestos cement pipe outside the construction limits that is designated to remain in place shall not be disturbed.

B. Documentation. Upon completion of removal and disposal of the asbestos cement pipe, the Contractor shall furnish to the Engineer a written report, prepared by the asbestos abatement entity, covering the following information:

- (a) Name and address of supervisor responsible;
- (b) The location and description of the project and the estimated amount of asbestos removed;
- (c) Starting and completion date. If the completion date differs from that originally scheduled, include reasons for delay;
- (d) Summary of the procedures used to comply with all applicable requirements, including copies of all notifications, if applicable;

- (e) Name and address of the waste disposal site and disposal receipts, including the amount of asbestos –containing materials disposed; and
- (f) Results of all air sampling conducted during the asbestos abatement project, if applicable, including personal, area and clearance samples.

III. METHOD OF MEASUREMENT

Asbestos cement pipe acceptably removed and disposed of will be measured in linear feet. Contrary to Section 203.02 of the Department's Standard Specifications, asbestos cement pipe removed from within the typical section will be included in the measured quantity.

IV. BASIS OF PAYMENT

The accepted quantity of asbestos cement pipe removed will be paid for at the contract unit price. Such payment shall be full compensation for all work required by this Special Note, including all excavation and acceptable backfill of any remaining cavities, and including full compliance with all laws and regulations for handling, transporting and disposing of asbestos cement pipe.

03-8.32

Project Construction Scheduling Information

The contractor will have 180 Working Days to complete construction. The construction of the box culvert will be completed using the diversion shown in the MOT plans. The contractor will have 60 calendar days from the time traffic is diverted to complete culvert construction and route traffic back to mainline. Liquidated damages at the rate of \$2,400/day will be charged for each day or fraction of a day beyond the above stated number of calendar days of traffic diversion.



KENTUCKY TRANSPORTATION CABINET
Department of Highways
DIVISION OF RIGHT OF WAY & UTILITIES

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Rev. 07/2015
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RIGHT OF WAY CERTIFICATION

ITEM #	COUNTY	PROJECT #	FEDERAL PROJECT #
03-8.32	SIMPSON	FD52 C107 6561901R	STPR 100-1 (5)
PROJECT DESCRIPTION Tennessee State Line-Franklin/US 31W Section 3B; Three Lane Widening from north of I-65 interchange to Wal-Mart/Lowes at Franklin.			
<input type="checkbox"/> 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 with FHWA regulations under the Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970, as amended. No additional rights of way or relocation assistance were required for this project.			
<input checked="" type="checkbox"/> ADDITIONAL RIGHT OF WAY REQUIRED AND CLEARED			
TOTAL NUMBER OF PARCELS ON PROJECT		34	IMPROVEMENTS
NUMBER OF PARCELS THAT HAVE BEEN ACQUIRED BY:			
Signed Deed	33	<input checked="" type="checkbox"/>	There were no improvements within the required right of way
Condemnation	1	<input type="checkbox"/>	All improvements have been removed from the required right of way
Signed Right of Entry Agreement	-0-		
RELOCATION ASSISTANCE			
Relocation Assistance was not required for this project	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Improvements are currently being removed and it is anticipated that right of way will be cleared prior to the letting date
All parties have been relocated in accordance with FHWA regulations	<input type="checkbox"/>	<input type="checkbox"/>	Improvement removal will be included in the construction contract
<input type="checkbox"/> ADDITIONAL RIGHT OF WAY REQUIRED WITH EXCEPTION			
TOTAL NUMBER OF PARCELS ON PROJECT			
Number of parcels acquired by Deed, Condemnation or Signed Right of Entry Agreement			
EXCEPTION(S)	ANTICIPATED DATE OF POSSESSION	IMPROVEMENTS	
		<input type="checkbox"/>	There were no improvements within the required right of way
		<input type="checkbox"/>	All improvements have been removed from the required right of way
		<input type="checkbox"/>	Improvements are currently being removed and it is anticipated that right of way will be cleared prior to the letting date
		<input type="checkbox"/>	Improvement removal will be included in the construction contract
RELOCATION ASSISTANCE			
Relocation assistance was not required for this project			<input type="checkbox"/>
All parties have been relocated in accordance with FHWA regulations			<input type="checkbox"/>
Notes/Comments:			
LPA		Right of Way Director	
Printed Name		Printed Name	D. L. Boy
Signature		Signature	<i>[Signature]</i>
Date		Date	10 August 2015
Right of Way Supervisor		FHWA	
Printed Name	Kelly R. Divine	Printed Name	No Signature Required
Signature	<i>[Signature]</i>	Signature	as per FHWA - KYTG
Date	8/10/15	Date	2013 Stewardship Agreement

UTILITIES AND RAIL CERTIFICATION NOTE

**SIMPSON COUNTY, STPR 100-1 (5)
FD52 107 65619 01 U
US-31W, Tennessee State Line – Franklin Road
3-8.32**

GENERAL PROJECT NOTE ON UTILITY PROTECTION

The Contractor is fully responsible for protection of all utilities)

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

Level Three Communication has existing Communication Facilities Right of and between Sta. 150+00 to 248+00.

Warren Rural Electric Cooperative: has existing Electric Facilities Left of and between Sta. 154+00 to 248+00, Right of and between Sta. 205+00 to 209+00, Right of Sta. 221+20 to 224+00.

Comcast Cable: has existing Communication Facilities Left of and between Sta. 154+00 to 248+00.

City of Franklin - Fiber: has existing Communication Facilities Left of and between Sta. 154+00 to 248+00.

Millennium Gas: has existing Gas Facilities Crossings at Sta. 180+50 and 228+20.

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

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

Simpson County Water District has existing and proposed water facilities at the following locations:

Mainline:

Existing: 8" Asbestos Concrete (AC) Waterline Left of and between Sta. 154+00 to 228+50, 10" PVC Waterline Left of and between Sta. 218+00 to 248+00, 10" PVC Waterline Right of and between Sta. 154+00 to 218+00, 8" AC Waterline Right of and between Sta. 228+50 to 245+00, 10" PVC Waterline Right of and between Sta. 245+00 to 248+00, Crossings: 10" Ductile Iron Pipe (DIP) in 16" Steel Casing at Station 153+05, 6" DIP in 10" Steel Casing at Sta. 172+90, Service Line at Sta. 182+60, 8" PVC at Sta. 187+10, Service Line at Sta. 192+50, Service Line at Sta. 205+55, Service Line at Sta. 208+05, Service Line at Sta. 209+70, 10" DIP in 14" Steel Casing at Sta. 217+85, Service Line at Sta. 221+90, 8" AC in 14" Steel Casing at Sta. 228+30.

Proposed: 8" DIP Waterline Left of and between Sta. 59+50 to 164+00, 8" DIP Waterline Left of and between 174+50 to 176+10, 8" DIP Waterline Left of and between Sta. 210+90 to 212+50, 10" PVC Waterline Left of and between Sta. 215+15 to 218+65, 12" DIP Waterline Left of and between Sta.

UTILITIES AND RAIL CERTIFICATION NOTE

<p>SIMPSON COUNTY, STPR 100-1 (5) FD52 107 65619 01 U US-31W, Tennessee State Line – Franklin Road 3-8.32</p>

218+65 to 223+00, 10" PVC Waterline Left of and between 223+00 to 246+00, 10" PVC Waterline Right of and between Sta. 168+50 to 174+50, 10" PVC Waterline Right of and between Sta. 192+50 to 208+10, 8" DIP Right of and between Sta. 227+85 to 228+50, 8" DIP Waterline Right of and between Sta. 243+25 to 245+00, Crossings: 6" DIP in 10" Steel Casing at Sta. 174+56, 10" DIP in 16" Steel Casing at Sta. 215+13, Service Line at Sta. 218+70, Service Line at Sta. 223+65, 8" DIP in 14" Steel Casing at Sta. 227+86.

Approach:

Existing: 3" PVC Waterline Left of and between Sta. 46+00 to 49+30, Crossings: 10" PVC in 16" Steel Casing at Peden Mill Road Sta. 50+60, 10" DIP in 16" Steel Casing at Lake Springs Road Sta. 49+60, 8" AC at Lake Springs Road Sta. 49+30.

Proposed: 4" PVC Waterline Left of and between Lake Spring Road Sta. 46+00 to 49+20, Crossings: 10" DIP in 16" Steel Casing at Peden Mill Road Sta. 51+09, 12" DIP in 18" Steel Casing at Lake Spring Road Sta. 49+20.

The Water District expects to complete relocation on or before December 31, 2015.

AT&T – KY has existing and proposed communication facilities at the following locations:

Existing:

Mainline: Communication Facilities Left of and between Sta. 153+00 to 245+00, Communication Facilities Right of and between Sta. 153+00 to Sta. 181+30, Crossings: 181+30, 209+65, 245+70.

Approach: Communication Facilities Left of and between Lake Spring Road Sta. 46+00 to 49+40.

Proposed:

Mainline: Communication Facilities Left of and between Sta. 156+30 to 218+60, Left of and between 222+85 to 246+00, Crossings: Sta. 181+00.

Approach: Communication Facilities Left of and between Lake Springs Road Sta. 46+00 to 49+10.

The Communications Company expects to complete relocation on or before December 31, 2015.

UTILITIES AND RAIL CERTIFICATION NOTE

**SIMPSON COUNTY, STPR 100-1 (5)
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US-31W, Tennessee State Line – Franklin Road
3-8.32**

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

City of Franklin Water and Sewer has existing and proposed sewer facilities at the following locations:

Existing: 6" PVC Force Main Left of and between Sta. 154+00 to 176+00, 10" PVC Gravity Sewer Left of and between Sta. 176+00 to 182+00, 10" PVC Gravity Sewer Right of and between Sta. 182+00 to 192+40, Left of and between Sta. 192+40 to 202+50, 10" PVC Gravity Sewer Right of and between 202+50 and 221+50, 6" PVC Force Main Right of and between Sta. 221+50 to 225+00, Mainline Crossings at Stations: 182+00, 192+40, 202+50. Approaches: 6" PVC Force Main Right of and between Macedonia Road Sta. 51+00 to 53+50.

Proposed: 6" PVC Force Main Left of and between Sta. 159+50 to 161+25, 6" PVC Force Main Left of and between Sta. 174+50 to 175+36, 10" PVC Gravity Sewer Left of and between 175+36 to 178+00, 10" PVC Gravity Sewer Left of and between Sta. 182+00 to 182+28, 10" PVC Gravity Sewer Left of and between Sta. 192+26 to 192+50, 10" PVC Gravity Sewer Left of and between Sta. 202+30 to 202+92, 10" PVC Gravity Sewer Right of and between Sta. 218+97 to 223+10, 6" PVC Force Main Right of and between Sta. 223+10 to 224+51, Mainline Crossings at Stations: 182+28, 192+26, 202+92. Approaches: 6" PVC Force Main Right of and between Macedonia Road Sta. 51+00 to 53+48.

Simpson County Water District has existing and proposed water facilities at the following locations:

Existing: 10" PVC Waterline Right of and between Sta. 162+00 to 168+50.

Proposed: 10" PVC Waterline Right of and between Sta. 162+00 to 168+50.

UTILITIES AND RAIL CERTIFICATION NOTE

**SIMPSON COUNTY, STPR 100-1 (5)
FD52 107 65619 01 U
US-31W, Tennessee State Line – Franklin Road
3-8.32**

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)

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.

BEFORE YOU DIG

The contractor is instructed to call 1-800-752-6007 to reach KY 811, the one-call system for information on the location of existing underground utilities. The call is to be placed a minimum of two (2) and no more than ten (10) business days prior to excavation. The contractor should be aware that owners of underground facilities are not required to be members of the KY 811 one-call Before-U-Dig (BUD) service. The contractor must coordinate excavation with the utility owners, including those whom do not subscribe to KY 811. It may be necessary for the contractor to contact the County Court Clerk to determine what utility companies have facilities in the area.

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

UTILITIES AND RAIL CERTIFICATION NOTE

**SIMPSON COUNTY, STPR 100-1 (5)
FD52 107 65619 01 U
US-31W, Tennessee State Line – Franklin Road
3-8.32**

AREA UTILITIES CONTACT LIST

<u>Utility Company/Agency</u>	<u>Contact Name</u>	<u>Contact Information</u>
<u>City of Franklin - Water and Sewer</u>	Chris Klotter	(270) 586-7944
<u>City of Franklin - Fiber Division</u>	Tammie Carey	(270) 586-4497
<u>Atmos Energy</u>	Ryan Chastain	(615) 771-8363
<u>AT&T KY</u>	Travis Parsley	(270) 846-3196
<u>Warren Rural Electric Cooperative Corp.</u>	Jonathan Lindsey	(270) 791-9908
<u>Millennium Gas</u>	Wayne Goodrum	(270) 776-4651
<u>Level Three Communications</u>	Jeffrey Cannon	(615) 419-6617
<u>Comcast Cable</u>	Mickey Babcock	(615) 405-5615
<u>Simpson County Water District</u>	Ryan Leisey	(270) 842-0052

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 Standard 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 look for a list of preapproved or prequalified contractors at the end of these general notes as identified above before bidding. Only contractors shown to be prequalified or preapproved by the utility owner on the following list(s) will be allowed to work on that utility as a part of this contract.

Any utility contractor that is not listed as prequalified or preapproved when the project is advertised for bid and wishes to be added must make request through the KYTC Contract Procurement website. The request should be made at least one week prior to the bidding deadline to allow for review and posting on

the KYTC Contract Procurement website. A contractor is only considered prequalified or preapproved when published on the KYTC Contract Procurement website. Contractors that contact the utility owner directly for preapproval or prequalification without contacting KYTC will not be considered for preapproval or prequalification for this contract. Contractors that are not prequalified or preapproved through KYTC before the bidding deadline will not be considered for prequalification or preapproval after bidding.

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.

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.

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 Standard 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:

City of Franklin (Sewer): No Materials are being supplied by the Utility.

Simpson County Water District (Water): The Utility shall supply 740 Lineal Feet of 10” PVC Pipe. No other Materials shall be supplied by the Utility.

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.

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 21341ND

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 LINE MARKER This item is for payment for furnishing and installing a ground level 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, 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, 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 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 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 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 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.

SIMPSON COUNTY WATER DISTRICT
SIMPSON COUNTY, KENTUCKY

SPECIFICATIONS AND
CONTRACT DOCUMENTS

US HWY 31W WATER LINE RELOCATIONS
I-65 TO VFW



Simpson County
Water District

April 1, 2015



Prepared by
Engineering Staff
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SECTION 1 **GENERAL SCOPE AND SPECIAL PROVISIONS**

1. Scope

The instructions and information set out in the paragraphs of the Detailed Specifications shall supersede the instructions and information set out in the Information for Bidders, General Conditions, and Supplemental General Conditions if and when differences occur.

2. Shop Drawings, Product Data, and Samples

Shop drawings, product data, and samples as discussed in Paragraph 5 of the General Conditions shall be furnished by the CONTRACTOR to the ENGINEER. Unless otherwise set out, all shop drawings shall be furnished in five copies. It shall be clearly understood by the CONTRACTOR that the ENGINEER will examine the shop drawings for general design only, and that his approval stamped on such drawings shall be approval only for general design, and the CONTRACTOR shall in all cases be held responsible for detailed dimensions. In case of discrepancy between the shop drawings and the requirements of the Drawings, Specifications, and Contract Documents, the provisions of the Drawings, Specifications, and Contract Documents shall prevail even though the shop drawings have been approved by the ENGINEER, unless the conflict therein has been specifically waived in writing by a Change Order.

3. Owner's Right to Carry Out the Work

If the CONTRACTOR defaults or neglects to carry out the work in accordance with the Contract Documents and fails within ten days after receipt of written notice from the OWNER to commence and continue correction of such default or neglect with diligence and promptness, the OWNER may, (without prejudice to any other remedy he may have) make good such deficiencies. In such case an appropriate Change Order shall be issued deducting from the payments then or thereafter due the CONTRACTOR the cost of correcting such deficiencies. If the payments then or thereafter due the CONTRACTOR are not sufficient to cover such amount, the CONTRACTOR shall pay the difference to the OWNER.

4. Execution and Coordination of the Work

4.1 It is intended that the work covered by this Contract be done so as to cause the minimum amount of interference with traffic and/or existing utilities. The CONTRACTOR will be required to organize and schedule his work so as to keep the existing facilities in full operation during the construction period insofar as is consistent with the nature of the construction work to be performed. The manner in which shutdowns will be made and the work schedule of the CONTRACTOR during shutdowns will be subject to the approval of the OWNER. The CONTRACTOR shall

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schedule a proposed shutdown with the OWNER at least three days prior to the outage. All shutdowns shall be made by employees of the OWNER. Although every effort will be made to cause the minimum amount of interference with the CONTRACTOR's work, the interest of the OWNER in regard to the existing facilities must always take precedence over the construction work. Therefore, the right is reserved by the OWNER to put any lines or other facilities (that may be shut down for the construction work) back into service when an emergency arises.

4.2 The work on the project shall be scheduled so as to expedite service to new customers. The CONTRACTOR shall install meters and perform testing as each section of new water main is constructed. Water lines or sections of lines thus completed shall be placed in service while work proceeds on other lines or sections.

4.3 Following installation of the pipeline, "rough cleanup" work shall be performed. This shall consist of grading the trench to create a neat, low mound of backfill material and disposing of any excavated material, rubbish, etc. (See Section 1, Paragraph 16 and Section 3, Paragraph 22) Crushed stone shall be added to driveways where necessary and fences repaired to the satisfaction of the property owners. After trenches have had adequate time to settle, final grade work and seeding shall be performed as described in Section 3, Paragraph 23.

5. Progress Schedule, Construction Records, and Reports

5.1 The CONTRACTOR shall furnish the OWNER with proof that all payrolls for services rendered and invoices for materials supplied have been duly paid as herein required, and such other data as the OWNER may require.

5.2 The CONTRACTOR shall furnish (and keep current) a suitable progress chart or schedule showing the estimated (and actual) progress on the work. The progress chart or schedule shall be subject to the approval of the ENGINEER.

5.3 The CONTRACTOR shall furnish all the necessary information for and prepare the partial payment estimates on forms approved by the ENGINEER.

5.4 The OWNER, or his authorized representatives and agents, shall be permitted to inspect all payrolls, records of personnel, invoices of materials, and other relevant data and records.

6. Lines and Grades

6.1 The CONTRACTOR shall be held totally responsible for construction of the work according to the lines and grades shown on the Drawings. The CONTRACTOR shall also insure that the work is constructed in proper relation to proposed highway construction where applicable.

6.2 The CONTRACTOR shall furnish all labor, equipment, stakes, and grade boards. The CONTRACTOR also shall be required to furnish equipment and aides when required by the ENGINEER in checking lines and grades. The labor and

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equipment shall be available to the ENGINEER on call, and the labor shall be fully capable of performing the duties of rodman and/or chainman.

7. Access to and Inspection of the Work

Representatives of the OWNER shall at all time have full access for inspection of the work and the CONTRACTOR shall provide proper facilities for such access and inspection.

8. Work on Private Property

8.1 In connection with work performed on private property, the CONTRACTOR shall take every precaution to avoid damage to the property owners' buildings, grounds, and facilities. Fences, hedges, shrubs, etc., within the construction limits shall be removed carefully, preserved, and replaced when the Construction is completed in accordance with the requirements set out hereinafter in these specifications. When construction is completed, the private property owner's facilities and grounds shall be restored to as good (or better) condition than found as quickly as possible at the CONTRACTOR's expense. The OWNER reserves the right to require the CONTRACTOR to obtain a signed Release from each property owner affected by the work. Said Release shall indicate that the property owner is satisfied with the restoration of his land. However, the execution of such a release shall not relieve the CONTRACTOR from any of his contractual obligations or other claims that may arise at a later date. The widths of construction easements obtained by the OWNER from property owners is normally 15 feet each side of the pipeline and the CONTRACTOR shall confine his activities to the area within the limits of the easements unless specific permission is obtained by the CONTRACTOR from property owners.

8.2 Large trees, or other facilities within the actual construction limits that cannot be preserved and replaced shall be removed by the CONTRACTOR but the OWNER will assume the responsibility for settling with the property owner for the loss of said trees or facilities. However, trees and facilities for which the OWNER has made such settlement will be designated on the Drawings and the CONTRACTOR shall be solely and entirely responsible for any damage to trees and facilities not so designated.

8.3 All trees and brush cleared along the route of the pipeline shall be disposed of by the CONTRACTOR in a manner suitable to the ENGINEER and property owner. If such trees and brush are left on the property the CONTRACTOR shall obtain a release for same from the property owner.

9. Traffic Control and Work in Highway Rights of Way

9.1 The CONTRACTOR shall (before beginning work on any public highway right-of-way) make arrangements for maintaining the traffic on said highways and/or roadways, or rerouting traffic as may be required. The applicable regulations of the Kentucky Department of Transportation (Ky D.O.T.) must be followed in this regard.

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9.2 The CONTRACTOR shall furnish proper equipment which shall be available at all times for maintaining streets and roads upon which work is being performed. All such streets and roads shall be maintained suitable for traffic until complete and final acceptance of the work.

9.3 When the CONTRACTOR is cutting across a street or highway, he is to cut half of the street at one time, lay the pipe, and complete the backfilling operation so that traffic may pass over this trench before the opening of the trench for the other half of the street or highway. In lieu of the above, bridging of the trench may be required. The time and method of making these crossings shall be approved by the ENGINEER, and the agency or legal entity having responsibility for the maintenance of the street or highway.

9.4 The CONTRACTOR shall be responsible for erecting signs, providing flagmen, providing any other such items, and performing all work as required by Kentucky D.O.T. regulations, the Kentucky D.O.T. permit granted to the OWNER for construction of this specific project, and/or regulations of other agencies having jurisdiction over the right-of-way.

9.5 The CONTRACTOR shall plan his operations so as to cause a minimum of inconvenience to property owners and to traffic. No road, street or alley may be closed unless absolutely necessary, and then only if the following conditions are met:

9.5.1 Permit is secured from appropriate, State, County or Municipal authorities having jurisdiction.

9.5.2 Fire and Police Departments are notified before road is closed.

9.5.3 Suitable detours are provided and are clearly marked.

9.6 No driveways shall be cut or blocked without first notifying the occupants of the property. Every effort shall be made to schedule the blocking of drives to suit to occupants' convenience, and except in case of emergency, drives shall not be blocked for a period of more than 8 hours.

10. Shoring, Sheeting, and Bracing of Excavations

10.1 Where unstable material is encountered or where the depth of excavation warrants it, the sides of the trench or excavation shall be supported by substantial sheeting, bracing, and shoring, or the sides sloped to the angle of repose. The design and installation of all sheeting, sheet piling, bracing, and shoring shall be based on computations of pressure exerted by the materials to be retained under existing conditions. Adequate and proper shoring of all excavations and safety of workmen shall be the entire responsibility of the CONTRACTOR; however, the OWNER may require the submission of shoring drawings (accompanied by supporting computations) for approval prior to the CONTRACTOR undertaking any portion of the work.

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10.2 Foundations, adjacent to where the excavation is to be made below the depth of the foundation, shall be supported by shoring, bracing, or underpinning as long as the excavation shall remain open and the CONTRACTOR shall be held strictly responsible for any damage to said foundations.

10.3 Care shall be taken to avoid excessive backfill loads on the completed pipe lines and the requirements regarding the width of the ditch as specified herein be strictly observed.

10.4 Trench sheeting shall not be removed until sufficient backfill has been placed to protect the pipe.

10.5 All sheeting, planking, timbering, bracing, and bridging, shall be placed, renewed, and maintained, as long as is necessary. Sheeting is not a pay item unless the CONTRACTOR is required and/or instructed by the OWNER to leave same in place.

11. Existing Utilities

11.1 Special precautions shall be taken by the CONTRACTOR to avoid damage to existing overhead and underground utilities owned and operated by the OWNER, or by other public or private utility companies.

11.2 With particular respect to existing underground utilities, all available information concerning their location has been shown on the drawings. While it is believed that the locations shown are reasonably correct, the OWNER cannot guarantee the accuracy or adequacy of this information.

11.3 The location of buried telephone cable often differs from the preliminary information given the OWNER by phone companies and shown on the drawings. Therefore, in order to construct a pipeline that is parallel to the highway right-of-way as specified, the CONTRACTOR may be required to cross buried telephone cable at various locations not indicated on the drawings. The CONTRACTOR shall consider these crossings as incidental to the pipeline construction.

11.4 Before proceeding with the work, the CONTRACTOR shall confer with all public or private companies, agencies, or departments that own and operate utilities in the vicinity of the construction work. The purpose of the conference (or conferences) shall be to notify said companies, agencies, or departments of the proposed construction schedule, verify the location of, and possible interference with, the existing utilities that are shown on the drawings, arrange for necessary suspension of service, and make arrangements to locate and avoid interference with all utilities (including house connections). The OWNER has no objection to the CONTRACTOR arranging for the said utilities companies, agencies, or departments to locate and uncover their own utilities; however, the CONTRACTOR shall bear the entire responsibility for locating and avoiding, or repairing damage to said existing utilities.

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11.5 Where existing utilities or other underground structures are encountered, they shall not be displaced or molested unless necessary and then only with the approval of the respective owner. In such cases they shall be replaced in as good (or better) condition than found as quickly as possible. All such utilities that are so displaced or molested shall be replaced at the CONTRACTOR's expense.

11.6 Should it become necessary to provide additional guying or support of power, lighting, or telephone facilities, the CONTRACTOR shall consult with the authorities of these utilities so that suitable arrangements can be made for the protection of same.

11.7 All costs for temporary or permanent work necessary for the protection of utilities, private or public, shall be included in the contract amount to which the items of work pertain, or may be considered to be incidental thereto. In addition, the CONTRACTOR shall be responsible for any damage to the existing utilities resulting from the construction operations and shall bear the cost of all repair or replacement necessary for correction.

11.8 It is expected that the CONTRACTOR will be diligent in his efforts and use every possible means to locate existing utilities. Any claims for unavoidable damage, based on improper or unknown locations, will be examined thoroughly in the light of the CONTRACTOR's efforts to locate the said utilities or obstructions prior to beginning construction.

12. Utilities Required by CONTRACTOR

All electrical current and/or any utility service required by the CONTRACTOR shall be furnished at his own expense except as noted hereinafter.

13. Supervision of Installation

All special equipment or materials shall be installed under the supervision of a qualified installation engineer and/or representative furnished by the manufacturer of such equipment or materials.

14. Execution of the Contract

The construction Contract and the Performance Bonds shall be executed within the time specified in the Information for Bidders and in at least three (3) copies.

15. Permits, Codes, Etc.

Unless otherwise set out in the Specifications or required by the agencies involved, the CONTRACTOR shall make application for, obtain, and pay for all licenses and permits, and shall pay all fees and charges in connection therewith. The CONTRACTOR shall be required to comply with all state or municipal ordinances, laws, and/or codes insofar as the same is binding upon the OWNER.

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16. Cleaning up and Removal of Rubbish

16.1 The CONTRACTOR shall at all times keep the premises free from accumulations of waste materials or rubbish caused by his employees or work and shall keep the work site in a clean and useable condition satisfactory to the ENGINEER. The CONTRACTOR shall direct his forces to promptly clean up streets, sidewalks, drainage channels, or private property, affected by his construction operations, when in the opinion of the ENGINEER such clean up is needed. At the completion of the work the CONTRACTOR shall remove all his rubbish from and about the site of the work and all of his tools, equipment, and surplus materials.

16.2 The Contract shall not be considered complete until all construction structures, equipment and rubbish from construction are cleaned from the site of the work. All damage to existing paving, grounds, and structures caused by the CONTRACTOR's operations must be repaired or the owners compensated for such damage before the contract will be considered complete. This includes the removal of rock from blasting (1 1/2 inches or over in size), and the broom sweeping, or water removal, of dirt from pavement.

17. Items Deleted and Quantity Changes

The OWNER reserves the right to delete any bid item or in the case of unit price items, the OWNER may delete, reduce, or increase the quantities involved. BIDDERS shall be aware of this possibility and shall base their BIDS accordingly.

SECTION 2 **QUALITY ASSURANCE**

1. Approval of Testing Agencies and Reports

When in these Contract Documents inspection and testing services are required, bureaus, laboratories, and/or agencies selected for such inspection and testing shall be approved by the ENGINEER. If inspection and testing services are provided by the OWNER or are performed in accordance with Section 7.8 of the General Conditions, the OWNER shall select the laboratories and/or agencies for such inspection and testing.

2. Suitability of Materials and Test Reports

Where prior inspection and testing of materials is required, documentary evidence in the form of test reports, in the form and number required by the ENGINEER, shall be furnished prior to the time the material is incorporated into the work. All rejected material shall be removed promptly from the premises.

3. Governing Specifications

It is the intention of the ENGINEER in the preparation of these Specifications to define properly the kind and quality of materials to be furnished. The standards of the American Society of Testing Materials (ASTM); standards of the American Water Works Association (AWWA); or other such agencies may be referred to in the Specifications. Where such standards are referred to, said references shall be construed to mean the latest amended and/or revised versions of the said standard specifications. In the selection of samples and the routine testing of materials, the testing laboratory shall follow the standard procedure as outlined by the ASTM, unless otherwise set out.

4. Extent of Inspection and Testing Service

It is intended that materials of construction, particularly those upon which the strength and durability of the work may depend, shall be inspected and tested to establish conformance with specifications and suitability for uses intended. The following is a schedule showing the extent of testing, and requirements and methods of reporting. If it is found that this list does not cover all items that will require testing, then such materials shall be tested as directed by the ENGINEER.

5. Requirements and Methods of Reporting

In general, four copies of all test reports will be required with two copies to the CONTRACTOR, one to the ENGINEER, and one to the OWNER. All copies shall be forwarded to the ENGINEER.

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6. Coarse Aggregate (Backfill and Surfacing)

Regarding coarse aggregates for use in backfill and surfacing, certifications, which state that the aggregates comply with the Specifications and give the gradation for each size used, will be required from the material supplier.

7. Concrete (Kickers, Anchors, Encasement and Pavement)

The mix design and a certification that the concrete supplied for this project is designed for a 28 day compressive strength of 2,500 psi shall be submitted by the supplier.

8. Fine Aggregate (For Use In Cement Concrete)

Standard tests shall be made in advance of concreting by an approved independent laboratory per ASTM C33, Paragraphs 2, 3, 4, and 5, and ASTM C40 on each fine aggregate proposed to be used. Other tests being satisfactory, the aggregate may be used pending results of 28 day concrete strength tests.

9. Coarse Aggregate (For Use In Cement Concrete)

Standard tests shall be made in advance of concreting by an approved laboratory on each grading of each coarse aggregate proposed to be used per ASTM C33, Paragraphs 6, 7, 8, 9, 10, and 11.

10. Concrete Tests (For Concrete Used In Structures)

10.1. Standard Slump Tests

Slump tests shall be made per ASTM C143. Not less than one such test shall be made for each 50 cubic yards of concrete placed at one operation.

10.2. Concrete Control Tests

10.2.1 During the progress of the work and for each different mix of concrete, standard concrete cylinders shall be made and tested. The testing shall be done per ASTM C39, and ASTM C31 (Paragraphs 7a and 7c). When field curing will be used in lieu of, or supplementing laboratory curing, care shall be exercised to avoid mistreatment of the cylinders in the field and testing shall be the same as specified for laboratory cured samples.

10.2.2 Test cylinders shall be made from each day's pour at the frequency specified by ACI 318 with a maximum of two (2) from each batch or ready-mix truck load. The maximum requirement will be imposed only when the ENGINEER deems necessary due to wide fluctuations in the concrete quality. A minimum of three (3) cylinders will be required for each day's pour if the concrete is used in structures or otherwise in a load-carrying capacity.

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10.2.3 Each cylinder shall be numbered and logged, so as to adequately identify the representative concrete in the structure. Where three (3) cylinders are made from each day's pour, one (1) cylinder shall be tested at 7 days and two (2) at 28 days. Where more than three (3) cylinders per day are required, the "break" schedule shall be as requested by ENGINEER.

11. Reinforcing Steel

Reinforcing steel shall undergo a field inspection for section, rust, shape, and dimensions, plus certified test report for heat number(s).

12. Ductile Iron Pipe

Each piece of pipe shall bear the manufacturer's name or trademark and the date manufactured. Each piece of pipe shall also be certified by the manufacturer to have met the requirements of the governing standard specifications. Manufacturer Certifications and test reports shall be forwarded to the ENGINEER. Also, each piece shall be visually inspected in the field for any defects and specification conformance.

13. PVC and PVC(MO) Pipe for Water Lines and Force Mains (Not Applicable to C905 PVC Pipe)

13.1 PVC or PVC (MO) pipe shall be marked in accordance with ASTM D-2241. PVC or PVC (MO) pipe shall be certified in accordance with NSF/ANSI 14 – 2012. The manufacturer shall supply certifications indicating that all pipe to be supplied for the project meets the applicable Specification and Standard. This information shall be furnished to the ENGINEER with the shop drawings.

13.2 The total quality system of the pipe manufacturer shall meet the requirements set forth in ISO/IEC 17025: 2005 and the pipe manufacturer shall be capable of maintaining the specified requirements of both the pipe and material. Pipe manufacturer compliance shall be required prior to approval of any shop drawings for PVC or PVC (MO) pipe.

13.3 Each truckload of pipe delivered to the project shall be subject to whatever field measurements and tests deemed necessary by the OWNER. These tests may be conducted by the OWNER or his representative. The cost of field testing shall be the responsibility of the OWNER, but the cost of any pipe destroyed during such testing shall be the responsibility of the CONTRACTOR.

13.4 In addition to the requirements and specifications of ASTM D-2241, all PVC pipe supplied under this Contract shall be concentric from spigot to bell. Any PVC pipe delivered to the project that fails this concentricity requirement will be rejected. The cost of replacement of rejected pipe shall be the responsibility of the CONTRACTOR.

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14. Testing Water Lines

14.1 Water lines shall be tested at a pressure equal to the rated working pressure of the pipe for a period of four hours. Line segments between gate valves shall be tested separately. During the duration of the test, the line segment shall display leakage not exceeding ten gallons per day per inch of pipe diameter per mile of pipeline. This rate of leakage is given below for 1,000 feet of pipeline and various diameters of pipe:

TABLE 2.1
 MAXIMUM RATE OF LEAKAGE FOR GIVEN DIAMETER OF PIPE

Pipe Diameter	Max. Leakage in 4 hrs. for 1,000 feet of pipe
4"	1.26 gallons
6"	1.89 gallons
8"	2.53 gallons
10"	3.16 gallons
12"	3.79 gallons
14"	4.42 gallons
16"	5.05 gallons
20"	6.13 gallons

14.2 Lines which fail to meet these criteria shall be repaired and retested as necessary until requirements are met. If the initial pressure test indicates that repairs must be made to a particular line segment, the ENGINEER may require a 24-hour pressure test to verify soundness of the construction work. This test shall be performed at no additional expense to the OWNER. Pressure tests shall be performed only after service line taps are completed.

14.3 The pressure gauge and/or recorder used for testing pipelines will be supplied by the OWNER. The CONTRACTOR shall supply the necessary pump, taps, connections, water meter, and all piping and fittings required for testing. All methods and equipment for pressure testing shall be as approved by the ENGINEER.

14.4 The CONTRACTOR shall schedule his work so that each section of water line or force main between gate valves shown on the Drawings shall be pressure tested in sequence as the pipeline work progresses. The CONTRACTOR's schedule in this regard shall be as approved by the ENGINEER.

15. Testing Tapping Sleeves

All tapping sleeves and valves shall be subjected to a pressure test while in place on the existing water line, prior to the existing line being tapped. The tapping sleeve and valve shall be tested at the rated working pressure of the sleeve over a period of 15 minutes. The connection being tested shall maintain 100 percent of the test pressure throughout the test period. The CONTRACTOR shall supply all necessary equipment for testing sleeves. Other details of the test shall be as directed by the ENGINEER.

SECTION 3 **WATER LINES AND WATER SERVICES**

1. Scope of the Work

The work to be accomplished under this section of the Specifications consists of the furnishing of all materials and labor necessary for the construction of water lines, including all services, meters, fittings, blow-offs, valves, accessories, and appurtenances in strict accordance with the Specifications and the applicable Drawings.

2. Location of Water Lines

2.1 The approximate location of water lines in relation to the limits of rights-of-way, pavement, etc. is shown on the Drawings but is not guaranteed. The location shown was chosen to minimize the overall project cost with respect to rock excavation, pavement replacement, crushed stone for traffic bound roadway, customer water services, etc. Water lines shall generally be constructed in easements on private property parallel to and within 10 feet of highway rights-of-way.

2.2 The final location (as constructed) may be varied upon approval by the ENGINEER, provided: (1) the proposed location is approved by the Kentucky Department of Transportation (Bureau of Highways), the County Highway Department, or other agency, legal entity or property owner having jurisdiction, and (2) the effect reduces the project cost. The final location may be varied by necessity due to construction conditions at the direction of the ENGINEER, or due to the requirements of the Kentucky Department of Transportation (Bureau of Highways), the County Highway Department, or other agency, legal entity or property owner having jurisdiction. The construction of pipelines in the highway, road, or street right of way will not be allowed except where shown on the Drawings.

3. Excavation of Pipeline Trenches

3.1 **Unless otherwise directed by the ENGINEER or as shown on the Drawings, trenches in which pipes 12 inches or less in diameter are to be laid shall be excavated in open cut to a depth which will allow a minimum of 2 feet 6 inches of cover above the top of the pipe or 2 feet 6 inches below the elevation of the existing roadway, whichever is lower.** The roadway based elevation provision is excluded in residential lawns. For pipes greater than 12 inches in diameter, the trenches shall be excavated in open cut to a depth which will allow a minimum of 4 feet of cover above the top of the pipe. The diameter of the pipe, proper bedding and construction of bell holes must be considered in determining the depth of excavation. Extra depth excavation may be required by the Kentucky Department of Transportation (Bureau of Highways) or as shown on

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the Drawings.

3.2 Topsoil shall be stripped from the top of the trench and placed to the side for reuse during the final layer of backfill to facilitate productive growth of lawns, crops, and other vegetation. Trenches shall be of sufficient width to provide free working space on each side of the pipe and to permit proper backfilling around the pipe, but unless specifically authorized by the ENGINEER, trenches shall in no case be excavated or permitted to become wider (as measured at the top of the pipe) than 2 feet plus the nominal diameter of the pipe. The desired width shall be the nominal diameter of the pipe plus 16 inches. The minimum allowable trench width in rock excavation shall be the nominal diameter of the pipe plus 12 inches. The minimum allowable trench width in earth excavation shall be the nominal diameter of the pipe plus 6 inches. Trenching equipment that cannot maintain these minimum widths will not be allowed for use on the project.

3.3 Trench excavation shall proceed far enough ahead of pipe laying to reveal any obstructions that might necessitate changing the line or grade of the pipeline. The trench shall be reasonably straight and uniform in grade. Trenches shall be kept free of water during the construction of the pipeline and removal of water shall be at the CONTRACTOR's expense. Trench excavation shall proceed in a continuous manner from the beginning of the pipeline to the end.

3.4 Unless specifically authorized by the ENGINEER, no skipping by obstacles such as rock, road crossings, existing utilities, etc. shall be permitted. If skips are authorized by the ENGINEER and the CONTRACTOR does not close the resulting gaps in the pipeline in a timely manner, the ENGINEER may require the CONTRACTOR to discontinue all other operations until the gaps are closed.

3.5 Unless specifically directed otherwise by the ENGINEER, not more than 500 feet of trench shall be opened ahead of the pipe laying, and not more than 500 feet of open ditch shall be left behind the pipe laying. All barricades, lanterns, watchmen, 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.

3.6 At the close of each working day all trenches that have been excavated shall be refilled unless exceptions are granted by the ENGINEER. All public or private drives shall be promptly backfilled or bridged at the direction of the ENGINEER.

3.7 All excavation shall be "unclassified" and therefore there will be no separate payment for rock excavation. The cost of all excavation should be merged into the cost of constructing the water line.

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4. Blasting

4.1. General

4.1.1 All blasting operations shall conform to Kentucky Department of Mines and Minerals code for explosive disintegration of rock. CONTRACTOR shall obtain permits from local authorities having jurisdiction before explosives are brought to site or drilling is started.

4.1.2 The CONTRACTOR shall keep explosives on the site only in such quantity as may be needed for the Work under way and only during such time as they are being used. He shall notify the ENGINEER, in advance, of his intention to store and use explosives. Explosives shall be stored in a secure manner and separate from all tools. Caps or detonators shall be safely stored at a point over 100 feet distance from the explosives. When the need for explosives has ended, all such materials remaining on the Work shall be promptly removed from the premises.

4.1.3 The CONTRACTOR shall observe all state, federal and municipal laws, ordinances and regulations relating to the transportation, storage, handling and use of explosives. In the event that any of the above-mentioned laws, ordinances or regulations require a licensed blaster to perform or supervise the Work of blasting, said licensed blaster shall, at all times have his license on the Work and shall permit examination thereof by the ENGINEER or other officials having jurisdiction.

4.1.4 No explosives shall be used within 20 feet of buildings and/or structures existing, constructed or under construction; or underground and/or overhead utilities whether existing or partially constructed.

4.1.5 Permission for any deviation from the restriction set forth above shall be secured from the ENGINEER, in writing; however, permission for any such deviations shall not relieve the CONTRACTOR from any responsibility in the event of damage to buildings, structures or utilities.

4.1.6 All operations involving explosives shall be conducted with all possible care to avoid injury to persons and property. Blasting shall be done only with such quantities and strengths of explosives and in such a manner as will break the rock approximately to the intended lines and grades and yet will leave the rock not to be excavated in an un-shattered condition. Care shall be taken to avoid excessive cracking of the rock upon or against which any structure will be built, and to prevent injury to existing pipes or other structures and property above or below ground. Rock shall be well covered with logs or mats, or both, where required. Sufficient warning shall be given to all persons in the vicinity of the Work before a charge is exploded.

4.1.7 The CONTRACTOR shall be solely responsible for his blasting operations. The CONTRACTOR shall not hold the OWNER and/or the

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ENGINEER liable for any damages resulting from his blasting operations on this project.

4.1.8 Blasting will not be permitted under or on CSXT's right-of-way.

4.2. Pre-blast Structure Survey

4.2.1 CONTRACTOR shall perform a pre-blast survey to determine and document with pictures the condition of adjacent structures, utilities, wells, buried cables, and other features within a minimum of 400 ft. of the blast area unless otherwise required by applicable regulatory authorities. Determine safe distances to structures or other facilities according to NFPA 495, Appendix B. Where facilities are closer than these distances, and natural barriers are not present, or when the amount of explosive cannot be reduced economically, blasting mats shall be used. Provide mats to protect environmentally sensitive areas, trees within 20 feet from the blasting area, streams, and rock formations from throw rock.

4.2.2 Purpose of survey is to document existing condition of structures prior to blasting, and is intended to be used as evidence in ascertaining whether and to what extent damage may have occurred as result of blasting. Survey shall be conducted prior to start blasting operations.

4.2.3 CONTRACTOR shall record information for each structure surveyed including:

- 4.2.3.1 Age and type of construction.
- 4.2.3.2 Location and character of cracks.
- 4.2.3.3 Evidence of settlement and leakage.
- 4.2.3.4 Other pertinent information.

4.2.4 Record pre-blast survey information on forms prepared specifically for pre-blast surveys. Supplement written records with photographs or videotape recordings. Submit copies of written records and photographs or videotapes to OWNER, and ENGINEER, prior to start of blasting.

4.3. Blast Design

4.3.1 Design each blast to avoid damage to existing facilities, adjacent property, and completed Work. Consider effects of blast-induced vibrations, air blast, and fly rock potential in design of each blast.

4.3.2 Establish appropriate maximum limit for vibration for each structure or facility that is adjacent to or near blast sites. Base maximum limits on expected sensitivity of each structure or facility to vibration, and federal, state, or local regulatory requirements, but not to exceed 1.25 in/sec. Whenever peak particle velocity exceeds vibration limits, change design of subsequent blasts, as necessary to reduce peak particle velocity to within

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limits established by Blaster-in-charge (BIC).

4.3.3 Establish appropriate maximum limit for air blast for each structure or facility that is adjacent to or near blast sites. Base maximum limits on expected sensitivity of each structure or facility to air blast, and federal, state, or local regulatory requirements, but not to exceed 0.015 psi peak overpressure (133 decibels). Whenever air blast exceeds limits, change design of subsequent blasts or provide controls necessary to reduce air blast to within specified limits.

4.4. Fly Rock Containment

Where fly rock may damage existing facilities, adjacent property, or completed Work, cover area to be blasted with blasting mats or provide other means that will contain and prevent scattering of blast debris.

4.5. Vibration and Air-Blast Monitoring

4.5.1 Monitor and record blast-induced vibrations and air blast using suitable sensors and recording equipment for each blast.

4.5.2 CONTRACTOR shall provide two (2) seismographs during blasting operations capable of the following:

4.5.2.1 Designed for monitoring blast-induced vibrations and air blast. Capable of recording particle velocity in three mutually perpendicular directions in range from 0 to 6 inches per second.

4.5.2.2 Flat vibration frequency response between 4 and 200-Hz.

4.5.2.3 Capable of recording air-blast overpressure up to 140 decibels.

4.5.2.4 Flat air-blast frequency response between 2- and 500-Hz.

4.5.3 Monitor on, or at, structures or other facilities that are closest to point of blasting. Monitoring more distant facilities that are expected to be sensitive to blast-induced vibrations and air blast.

4.5.4 BIC shall supervise establishment of monitoring programs and initial operation of equipment; review interpretation of records and recommend revisions of blast designs.

4.5.5 Include following information in blasting plan:

4.5.5.1 Vibration and air-blast limits as recommended by BIC.

4.5.5.2 Name of qualified BIC who will be responsible for monitoring program and interpretation of records.

4.5.5.3 Types and models of equipment proposed for monitoring.

4.5.5.4 Numbers and locations of proposed monitoring stations.

4.5.5.5 Procedures to be used for coordinating recording of each

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blast.

4.5.5.6 Steps to be taken if blasting vibrations or air blast exceed limits.

4.6. Blasting Records

4.6.1 For each blast, document the following:

4.6.1.1 Location of blast in relation to Project stationing or state plane coordinate system and elevation.

4.6.1.2 Date and times of loading and detonation of blast.

4.6.1.3 Name of person in responsible charge of loading and firing.

4.6.1.4 Details of blast design, as previously specified.

4.6.1.5 Vibration records including location and distance of seismograph geophones to blast and to nearest structure, and measured peak particle velocity. Report peak particle velocity in units of inches per second.

4.6.1.6 Air-blast records. Report peak air blast values in units of pounds per square inch overpressure above atmospheric or in decibels at linear response.

4.6.1.7 Comments by BIC regarding damage to existing facilities, adjacent property, or completed Work, misfires, fly rock occurrences, unusual results, or unusual effects as required.

4.7. Suspension of Blasting

4.7.1 In event damage to existing facilities, adjacent property, or completed Work occurs due to blasting, immediately suspend blasting and report damage to ENGINEER and OWNER. CONTRACTOR shall be responsible for all costs of repairs or replacement due to damage from blasting.

4.7.2 Before resuming blasting operations, adjust design of subsequent blasts, or take other appropriate measures to control effects of blasting, and submit complete description of proposed changes for reducing potential for future damage.

4.7.3 Do not resume blasting until authorized by OWNER and applicable regulatory authorities.

5. Pipe Bedding and Initial Backfill

For all pipe 14 inches in diameter and larger, or where rock excavation is encountered or in rocky soil as directed by the ENGINEER, the pipe shall be bedded with six (6) inches of crushed stone under the pipe. Crushed stone shall be used in the initial backfill from the bottom of the pipe to the centerline of the pipe. Initial backfill material shall be placed and thoroughly compacted by hand

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tamping. Initial backfill material shall be deposited in the trench for its full width on each side of pipe, fittings and appurtenances simultaneously. Care must be taken to compact fill along the sides of the pipe and appurtenances adjacent to pipe wall. Crushed stone shall be No. 9-M or #57 as described in the *Standard Specifications for Road and Bridge Construction* as published by the Kentucky Department of Transportation, Bureau of Highways. In certain cases the CONTRACTOR may be required to move earth of good quality from previous trench excavation for use as bedding material.

6. Pipe Laying

6.1. General

6.1.1 The CONTRACTOR shall notify the ENGINEER as to the date and time of all pipe deliveries and shall not unload any pipe except in the presence of the Inspector. Pipe shall be transported and handled in strict conformance with the manufacturer's recommendations.

6.1.2 The CONTRACTOR will be required to stockpile all pipe in central locations. Pipe strung along the route of the pipeline, shall be limited to the current day's expected production.

6.1.3 Pipe laying shall be in strict accordance with the manufacturer's recommended practice. Special tools, lubricant and equipment for proper laying shall be provided by the manufacturer. If the CONTRACTOR proposes a method of installation not covered by the manufacturer's recommended procedures, the CONTRACTOR shall obtain written certification from the manufacturer that installation by this proposed method will in no way affect the manufacturer's warranty of the pipe.

6.1.4 Pipe shall not be rolled, or dropped, into the trench.

6.1.5 All angles or bends in the pipe lines, either vertical or horizontal shall be satisfactorily braced or anchored against the tendency of movement with concrete anchors to the satisfaction of the ENGINEER.

6.1.6 Open ends of unfinished pipelines shall be securely plugged or closed at the end of each day's work, or when the line is left temporarily at any other time.

6.2. Ductile Iron Pipe

6.2.1 The trench shall be excavated to the required depth and width, bell holes and/or joint holes shall be dug in advance of the pipe laying.

6.2.2 The beds of each piece of pipe shall be prepared carefully so that each individual piece of pipe shall have a uniform bearing. Pipe shall be laid in a straight line and grade without kinks or sags, and shall be laid in a

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workmanlike manner. Bell holes and/or jointing holes shall be large enough so that the bell or hub will clear the ground and leave ample room for making and inspection of joints.

6.2.3 Before each piece of pipe is lowered into the trench, it shall be swabbed out thoroughly to insure its being clean. Each piece of pipe shall be lowered into the trench separately.

6.2.4 Care shall be taken to prevent injury to the pipe coating both inside and outside. No piece of pipe or fitting which is known to be defective shall be laid or placed in the lines. If any defective pipe or fittings shall be discovered after the pipe line is laid, they 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.

6.3. Plastic Pipe

6.3.1 Plastic pipe shall be installed in accordance with manufacturer's recommendations. A representative who is a direct employee of the pipe manufacturer shall conduct training sessions for CONTRACTOR's personnel regarding proper pipe installation. The manufacturer's representative shall certify to the ENGINEER the names of CONTRACTOR's personnel who have attended such training. Pipe laying and assembly work shall be performed only by personnel who appear on the manufacturer's certified list.

6.3.2 Backfilling shall be done in accordance with Paragraph 7, Backfilling Pipeline Trenches, where not in conflict with manufacturer's recommendations.

7. Backfilling Pipeline Trenches

7.1 Backfilling shall be conducted at all times in a manner to prevent damage to the pipe and the exterior protection on the pipe. Placing of backfill shall be done only in the presence of the ENGINEER after his final inspection and acceptance of the pipe in place. If material for backfilling is not available at the construction site, the CONTRACTOR shall "import" earth of good quality from a site approved by the ENGINEER. This will not be a separate pay item.

7.2 In areas of earth excavation of the pipeline trench, earthen material reasonably free from rock and acceptable to the ENGINEER shall be used in the backfilling of the trench. Backfill material free of rock over one inch in diameter shall be placed around the pipe up to the point where the pipe is thoroughly covered with at least one foot of material. Walking or working on the completed pipe (except as may be necessary in backfilling) shall not be permitted until the trench has been backfilled to a height of at least one foot above the top of the pipe. The filling of the trench shall be carried on simultaneously on both sides of the pipe

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in such a manner that the completed pipeline will not be disturbed and injurious side pressures do not occur.

7.3 In areas of rock excavation of the pipeline trench, crushed stone as used for bedding shall be used as backfill material to a level 6 inches above the top of the pipe. Placement of this backfill material shall be performed as described above. In certain cases in lieu of or in addition to the crushed stone backfill the CONTRACTOR may be required to use earth of good quality as backfill material to a depth of 12 inches above the pipe as described above.

7.4 In filling the remainder of the trench above the initial backfill described above, whether in earth or rock excavation, earth backfill material reasonably free of rock may be shoved into the trench without compacting and heaped over, then compacted by rolling with the wheel of a grader or front-end loader. Earth backfill material containing rocks greater than 6 inches in diameter shall not be acceptable.

7.5 The final step in the backfill operation shall be to windrow good quality earthen material over the top of the ditch. The windrow shall be no higher than one foot and no wider than the width of the ditch plus 4 feet. All other excavated material except that required for the above described windrow shall be considered excess and shall be disposed of as described hereinafter.

7.6 Where street, driveway and highway crossings are made and where streets or highways are proposed, the CONTRACTOR will be required to tamp all backfill as described hereinafter and backfill the trench with No. 9-M crushed stone.

7.7 Where tamping is required, the backfilling shall all be done in layers not exceeding 6 inches and firmly tamped into place by tampers or rammers. The ENGINEER may permit puddling of ditches to compact the backfill in lieu of tamping with mechanical tampers except where street paving is to be replaced immediately after the backfilling is completed. The ENGINEER may also require puddling where (in his opinion) it is necessary for proper compaction.

8. Disposition of Excess Excavated Material

Excavated materials not used for backfill including "shot rock" and boulders shall be disposed of within one week of the adjacent trench being backfilled. Disposal of excavated material shall be performed so as to cause the least interference with the completed pipeline and operations of the OWNER, property owners, etc. and in a manner satisfactory to the ENGINEER.

9. Replacing Streets and Roadways

9.1 The CONTRACTOR shall replace all streets, alleys, driveways, and roadways which may be removed, disturbed, or damaged in connection with his operations under this Contract. CONTRACTOR shall reconstruct same to the satisfaction of the Kentucky Department of Transportation, the County Highway Department, or other legal entity or property owner having jurisdiction. The reuse

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of materials removed in making excavations will be permitted, provided said materials are in good condition and acceptable to the ENGINEER.

9.2 The CONTRACTOR will be paid for street replacement only where the line is constructed within the paved surfaces. Care shall be exercised to minimize damage to graveled shoulders and paved surfaces.

9.3 Gravel, crushed limestone, bituminous materials, or other materials used in the resurfacing of streets, shall meet the current requirements of the Kentucky Department of Transportation (Bureau of Highways) Specifications.

9.4. Traffic-Bound Base Course

9.4.1 On all trenches where replacing streets or drives is required, it shall be handled in the following manner:

9.4.2 After the backfill has been compacted (by mechanical tamping) and brought up to approximately finish grade, the CONTRACTOR then shall place crushed stone when and as directed by the ENGINEER as a traffic-bound base course, at the proper elevation to allow for settlement but not in such a way as to prevent traffic from using it. Crushed stone shall be Kentucky Department of Transportation, dense graded aggregate.

9.4.3 The CONTRACTOR may be required by the ENGINEER to maintain the traffic-bound base course (by adding crushed stone as specified hereinbefore) in a safe and passable condition for a period of 60 days (or until such time as sufficient settlement has taken place in the opinion of the ENGINEER) and the trenches are ready for final resurfacing. Crushed stone will be paid for at the unit bid price specified in the Contract.

9.5. Subgrade for Final Resurfacing

9.5.1 The traffic-bound course hereinbefore described shall comprise the base course for all types of resurfacing.

9.5.2 When, in the opinion of the ENGINEER, the trench has reached a condition of settlement satisfactory for final resurfacing, the CONTRACTOR shall first strip the base course or backfill with crushed stone (size as specified hereinbefore) to obtain the proper subgrade elevation. The subgrade then shall be rolled with an approved type roller or tamped until thoroughly compacted. Any depressions shall be filled with crushed stone (as specified hereinbefore) and the process of rolling or tamping continued until the subgrade has a smooth and uniform surface.

9.6. Portland Cement Concrete Pavement

Where Portland Cement Concrete Pavement is to be replaced, or is required under bituminous pavement replacement, it shall conform to the

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existing pavement and/or the ENGINEER'S instructions (not less than 6 inches thickness), and the type concrete required by the Kentucky Department of Transportation shall be used.

9.7. Asphaltic Concrete Pavement

9.7.1 Where asphaltic concrete pavement is to be replaced, the subgrade shall be prepared as hereinbefore specified, and this subgrade shall comprise the base course upon which the concrete subslab and/or the bituminous pavement shall be laid. Asphaltic concrete shall be as required by the Kentucky Department of Transportation.

9.7.2 Where no Portland cement concrete subslab is required, the subgrade or base shall be cleaned and broomed thoroughly and a prime coat of medium tar shall be applied uniformly at the rate of 0.20 to 0.25 gallons per square yard. Where Portland cement concrete subslab is required, the prime shall be applied at the rate of approximately 0.05 gallons per square yard. The prime shall be applied by a pressure distributor or other approved pressure spray method.

9.8. Bituminous Surfacing (Surface Treatment)

9.8.1 Where bituminous surfacing is to be replaced as shown on the Drawings, or as directed by the ENGINEER, the traffic-bound base shall comprise the subgrade upon which the bituminous surfacing shall be constructed. After the subgrade or base has been prepared, thoroughly cleaned and broomed, a prime coat of medium tar shall be applied at the rate of 0.30 to 0.35 gallons per square yard.

9.8.2 When the prime coat has become tacky but not hard, the bituminous material (asphalt of the grade directed by the ENGINEER) shall be applied in two applications at the rate of 0.35 to 0.45 gallons per square yard for each application. The CONTRACTOR shall apply approximately 50 pounds of crushed stone chips per square yard between the two applications of bituminous material, and 35 to 40 pounds of chips per square yard after the final application of bituminous materials.

9.9. Untreated Surface

9.9.1 Where the existing surface is untreated gravel or stone, the CONTRACTOR shall reuse all native materials possible using crushed stone as required, replacing the surfacing that is disturbed or removed with crushed stone equal to the grade present prior to construction.

9.9.2 Prior to final acceptance, the CONTRACTOR shall fill in all depressions with crushed stone as hereinbefore specified, and shall thoroughly roll and grade to the existing surface.

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9.10. General

The CONTRACTOR shall be held responsible for any and all damage occurring to street and road paving due to his operations outside the actual limits of his work, and shall replace any such damage to as good, or better, condition than that which existed prior to the CONTRACTOR's operations and at no additional expense to the OWNER.

10. Concrete Kickers, Anchors, Cradles, and/or Encasement

10.1 Concrete kickers, anchors, cradles, and/or encasement of water lines shall be placed where and as shown on the Drawings, or as directed by the ENGINEER.

10.2 Concrete for anchors, kickers, cradle, and/or encasement shall be 2,500 psi concrete and shall be mixed sufficiently wet to permit it to flow under the pipe to form a continuous bed. In tamping concrete, care shall be taken not to disturb the grade or line of the pipe, or to injure the joints. Concrete placed outside the specified limits or without authorization from the ENGINEER will not be subject to payment.

10.3 Thrust blocks shall be provided in accordance with details shown on Drawings and must bear against an undisturbed trench face. Thrust blocks must be used even when special locked-joint fittings, anchoring fittings, or pipe clamps with tie rods are employed. Fitting bolts shall be protected from the concrete being poured for thrust blocks by using plastic sheeting to cover the area of the bolts.

11. Pipe and Fittings for Water Lines

11.1. General

Pipe for water mains shall be nominal diameter and material indicated on the Drawings. The pipe shall be as specified herein and shall be either PVC or ductile iron.

11.2. Fittings

11.2.1 Ductile iron mechanical joint fittings shall be required for all sizes of PVC and ductile iron pipe. Ductile iron mechanical joint fittings shall conform to AWWA specification C 153 and shall have a rated working pressure of 350 psi up to 24-inch diameter and 250 psi above 24-inch. Ductile iron fittings shall be furnished with a bituminous coating outside in accordance with AWWA specification C 153 and shall be cement mortar lined inside in accordance with AWWA specification C 104.

11.2.2 Only high strength low alloy steel T-bolts shall be used with all mechanical joints including fittings, valves, etc. All glands, T-bolts and other accessories shall be manufactured and provided by the same manufacturer as the fittings on which the accessories are used.

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11.2.3 Fittings used in pipeline sections noted on the Drawings to be restrained shall be slip joint type fittings that incorporate the specified type of restraining system used with ductile iron pipe or mechanical joint type fittings with approved restraining devices listed below.

11.2.4 Fittings shown on the Drawings are intended to convey the general configuration only. The CONTRACTOR shall be required to furnish fittings at each abrupt change (vertical or horizontal) in the pipeline alignment, as determined by the ENGINEER. The CONTRACTOR shall also be required to furnish any special gaskets, adaptors, etc. necessary for construction.

11.2.5 All vertical bends and all bends greater than 12 inches in diameter shall include approved restraining devices. Approved restraining devices are Megalug by EBBA Iron, Inc., GripRing by Romac Industries, Inc., or approved equal.

11.2.6 Fittings and accessories shall be manufactured in the United States and shall be Union/Tyler, ACIPCO, U.S. Pipe, or approved equal.

11.3. Ductile Iron Pipe

11.3.1 Ductile iron pipe shall conform to AWWA specifications C 150 and C 151 with a rated working pressure of 350 psi for 4-inch through 12-inch diameter pipe and 250 psi for pipe 14-inch and larger, under the laying conditions and depth of cover specified herein.

11.3.2 Ductile iron pipe shall be furnished with an outside bituminous coating approximately one mil thick and shall be cement mortar lined inside according to AWWA specification C 104.

11.3.3 The joints for ductile iron pipe shall be in accordance with AWWA specification C 111 and shall be the "push-on" type. The allowable deflection in each joint shall be a minimum of 3 degrees and gasket lubricant shall be used as recommended by the pipe manufacturer.

11.3.4 Ductile iron pipe shall be "Fastite" as manufactured by American, "Super Bell-tite" as manufactured by Clow Corp., "Tyton" as manufactured by U.S. Pipe Corp., or approved equal.

11.3.5 In certain locations as described herein, ductile iron pipe and fittings shall be provided and installed with restrained joints. The restrained joint system for pipe shall be similar to "Flex-Grip" by American Ductile Iron Pipe, "Field-Lok" by U.S. Pipe or approved equal. If mechanical joint fittings are used in lieu of push-on-joints, joint restraint shall be accomplished as specified in the preceding subsection.

11.3.6 The locations where restrained joints are required are as follows:

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11.3.6.1 All ductile iron carrier pipes used in casing pipe for road crossings. Restrained joints shall be used between and include the adjacent fitting on each side of the crossing.

11.3.6.2 At all fittings used in the ductile iron water line, fittings, and joints shall be restrained to result in the following restrained footage each side of the fitting, as specified herein.

TABLE 3.1

MINIMUM RESTRAINED LENGTH
 EACH SIDE OF DUCTILE IRON PIPE

Fitting	Restrained Pipe Length
90° Bend	87 LF
45° Bend	36 LF
22 ½° Bend	17 LF
11 ¼° Bend	17 LF
Tee	64 LF
Dead End	65 LF

11.4. Plastic (PVC) Pipe

11.4.1 Plastic pipe shall be polyvinyl chloride (PVC) and shall meet the requirements set forth by ASTM D1784 for Type 1, Grade 1. All plastic pipe shall bear the National Sanitation Foundation Testing Laboratory seal for potable water. All plastic pipe shall be certified in accordance with NSF/ANSI 14 – 2012. The pipe shall also meet the requirements of ASTM D-2241, ASTM D-3139, and all other specifications referred to therein.

11.4.2 In general and unless indicated otherwise on the Drawings, PVC pipe shall be Class 200 (SDR-21). However, in certain areas Class 250 (SDR-17) PVC pipe may be required.

11.4.3 Provision shall be made for contraction and expansion at each joint with either twin gasketed couplings or integral bell joints. Gasket systems shall be Reiber or other locked-in type as approved by the ENGINEER. Twin gasketed couplings shall be rated for working pressure equal to that of pipe and shall be as manufactured by the pipe manufacturer.

11.4.4 PVC pipe shall be manufactured by a company that has made pipe in accordance with ASTM D-2241 under the brand name to be supplied on this project continuously over the previous five (5) year period. Pipe shall be manufactured at a plant that has been owned, operated and controlled by the same manufacturing company and has produced PVC pipe in accordance with ASTM D-2241 as a routine standard procedure for the last three (3) years. The plant shall be certified in accordance with NSF/ANSI 14 – 2012 for the PVC pipe specified. PVC pipe shall be Vulcan, National, Royal, Pipelife-Jetstream, or North American.

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11.4.5 Pipe manufactured with Molecular Oriented Poly (vinyl Chloride), PVC (MO), may be substituted for the PVC pipe described above. PVC (MO) pipe shall conform to ASTM F1483 and shall be Ultra-Blue as manufactured by JM Eagle, Inc.

11.4.6 Note special PVC and PVC (MO) pipe testing requirements, Section 2 Paragraph 13.

12. Gate Valves, Butterfly Valves, and Boxes

12.1 Gate valves shall comply with AWWA specification C 509 and shall be of the resilient wedge type, epoxy coated, iron body, non-rising stem and fully bronze mounted. Valves shall be suitable for water working pressures of 250 psi. Valves shall be of standard manufacture and of the highest quality both as to materials and workmanship. Gate valves shall be either the A-2360 series by Mueller Company, Style A067 by M & H Valve Company, or US Pipe equivalent.

12.2 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 water pressure cast on the body of the valve. Unless otherwise indicated on the Drawings, all gate valves shall be provided with a 2-inch square operating nut and shall open by turning counterclockwise.

12.3 Butterfly valves shall be Muller Linesal III, M&H #4500, or #1450 Class 150B meeting the requirements of AWWA C504. They shall have mechanical joint connections with a 2-inch square operating nut and shall be suitable in all respects for underground service.

12.4 All gate valves and butterfly valves installed in Ductile Iron water mains shall be restrained against movement by either rodding the valve to adjacent fittings or use of "Megalugs" or equal.

12.5 Valve boxes shall be cast iron, two piece, screw type 24-inch to 36-inch extension with drop covers marked "WATER" and they shall be set vertically, properly adjusted so that the cover will be in the same plane as the finished surface of the street or ground. The box shall have a 5 1/4-inch shaft. Valve boxes shall be as manufactured by Mueller, Clow, M & H, or an approved equal.

12.6 **Any valve that is installed at a depth to the operating nut greater than 3 feet below the final elevation of the valve box top shall be fitted with a valve operator extension.** The length of the extension shall place the operating nut 12 to 24 inches from the valve box top. The extension shall be secured to the valve nut with a set screw. The extension shall include a 1-inch solid steel shaft, 2-inch square top nut, and centering ring near the top. Valve operator extensions shall be manufactured by an entity regularly engaged in the manufacture of such equipment, and be Water Key Model VE-XX, or approved equal.

13. Tapping Sleeves and Valves

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13.1 Tapping sleeves for cast iron or ductile iron pipe shall be mechanical joint and shall be Mueller H615 or M & H Style 1174. Tapping sleeves for A.C. pipe shall be mechanical joint and shall be Mueller H-619 or approved equal. Tapping sleeves for 4-inch through 8-inch PVC pipe shall be Mueller H-304 or Smith Blair No. 622. Tapping sleeves for 10-inch and 12-inch PVC pipe shall be Smith-Blair No. 622 fabricated steel sleeves, epoxy coated with stainless steel bolts and nuts.

13.2 Tapping valves shall meet the same general specifications as described herein for gate valves.

14. Blowoffs

Blowoff valves and appurtenances shall be constructed where shown on the Drawings and as detailed on the standard detail sheet. Gate valves as specified hereinbefore and the meter boxes described below shall be used in the blowoff assembly. Bends used in blowoff assemblies may be PVC with gasketed joints, as approved by the ENGINEER.

15. Fire Hydrants

15.1 Fire hydrants shall be "dry barrel," cast iron bodied, fully bronze mounted, suitable for a working pressure of 150 psi, and shall meet all requirements of the latest AWWA C502 specifications. Each hydrant shall be given a 300 psi hydrostatic test in the shop. Hydrants shall be Mueller Model A-423.

15.2 The waterways of hydrants shall be as free as possible of obstructions, sharp turns, corners, or other causes for resistance. The base of the hydrant shall have a bell connection to admit a proper connection with a standard mechanical joint. Bury depth shall be 3 feet 6 inches minimum or as required to bring the hydrant to the proper grade.

15.3 Hydrants shall have a 6-inch connection to 6-inch and larger mains, 2 1/2-inch brass nozzles with threads for steamer couplings, together with caps fastened securely to each hydrant and threaded to fit nozzles. The main valve of the hydrant shall be not less than 5 1/4 inches in diameter with 7-inch inside diameter riser barrel. All connection threads shall comply with standard specifications of the National Board of Fire Underwriters.

15.4 The hydrant main valve shall be of the compression type, closing with pressure. The valve shall be faced with heavy impregnated waterproof balata or other approved material. The main valve of the hydrant shall be not less than 5 1/4 inches in diameter when installed on 6-inch or larger mains and 4 1/2 inches in diameter on 4-inch mains.

15.5 Hydrants shall have a safety "breakable flange" section located above the ground line. The distance from the ground line of the hydrant to the top of the hydrant head shall be not less than 30 inches. A maximum of one section of vertical riser shall be accepted. Vertical riser, if required, shall be incidental to hydrant

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installation. In most situations the CONTRACTOR shall be required to turn the hydrant top 180 degrees so that the pumper nozzle will face the street.

15.6 Hydrants shall be supplied with factory applied paint. The color shall be Safety Yellow. The factory applied paint shall be protected during transport and installation. Any hydrants which have excessive chips, scratches, or other abrasions, in the opinion of the ENGINEER, shall be subject to rejection. After installation, exposed surfaces of hydrants shall be painted with two (2) coats of the paint indicated below. The bonnets of the hydrants shall be painted with two (2) coats of a contrasting color to indicate potential flow rate as directed by the ENGINEER. The paint shall be Rust-oleum 9800 System DTM Mastic. Barrel color shall be Safety Yellow. Bonnet colors shall be Safety Red, Safety Orange, Safety Green, or Safety Blue.

16. Meters, Meter Boxes and Meter Equipment

16.1. General

16.1.1 Where shown on the Drawings, existing water meters shall be relocated in new meter settings. The CONTRACTOR shall install on the new mains entire new meter settings as shown on the standard detail sheet and as specified herein. When all new meter settings are installed and pressure testing, disinfection and bacteriological testing is completed, the water meters which are in existing settings shall be removed and installed in the new settings. (In special situations where new meters are required in a particular location, it shall be so noted on the Drawings.)

16.1.2 At the time the water meter is relocated the CONTRACTOR shall also connect the new meter setting to the existing customer's service line which is between the meter and the house or business. Pipe used in making this connection shall be of the same size, material, and type as the existing customer service line, unless otherwise indicated on the Drawings, but in general will be either Sch 40 PVC pipe or P.E. tubing to match existing customer service line. The connection at the meter setting to the new customer service line shall be made with a galvanized or brass compression coupling on a brass nipple which is to be threaded into the yoke. The method and materials used to connect new customer service pipe to existing customer service pipe shall be Style 65 Dresser couplings, or as approved by the ENGINEER. The work of relocating existing meter installations shall be performed in such a way that interruptions of service to each customer are minimized.

16.2. Meter Boxes

16.2.1 Meter boxes shall be cylindrical with a height of 24 inches. The meter box diameter for 3/4 inch services shall be 18 inches. Boxes with a diameter of 20 inches shall be used for all 1-inch and regulated 3/4-inch

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services.

16.2.2 Boxes shall be a PVC "shell" meter box manufactured from SDR 51 PVC irrigation pipe as manufactured by Mueller Company.

16.2.3 Meter box covers shall be cast iron with locking lid using "large" pentagon bolts. Covers shall have an 18-inch or 20-inch inside diameter as required and an 11 1/2-inch lid opening. The lid shall be marked "Water Meter". Meter box covers shall be Type A32-LB or Type A3-LB as manufactured by the Ford Meter Box Company.

16.2.4 Meter boxes and covers for meters larger than 1-inch shall be as shown on the standard detail sheet.

16.3. Meter Fittings

16.3.1 The necessary corporation stops, curb valves, and all other fittings and accessories shall be furnished as indicated on the Drawings. Service saddles shall be Mueller Series H-134 for PVC pipe and Mueller Series BR-1-B for ductile iron pipe. Corporation stops shall be Mueller # H-15008.

16.3.2 Service saddles for 2-inch taps shall be Mueller, Smith Blair, or approved equal, double strap type with 1.P threads for use with a 2-inch by 4-inch brass nipple. A 2-inch Mueller A-2360 gate valve, or approved equal, with threaded connections shall be used in lieu of a cooperation stop.

16.3.3 For 3/4-inch services, yokes shall be Mueller #H-1404-2 except where a regulator is required and then yokes shall be Mueller #H-1404-012. All 1-inch yokes shall be Mueller #H-1404-2 (See the Standard Detail Sheet). All yokes shall include a lock wing stop and check valve. Inlet connections shall be either Mueller #H-14227 or #H-14222 as required by the particular situation and all outlet connections shall be #H-14222. See the standard detail sheet for additional information regarding fittings for services.

16.3.4 Pressure regulators, where required, shall be Wilkins 600DM-HR, or approved equal for 3/4-inch services and Watts 223HP-Z3, or approved equal or 1-inch services. The adjusting screw on pressure regulators shall remain at the factory setting.

16.4. Service Connection Tubing

16.4.1 Service connection tubing shall be 3/4-inch or 1-inch plastic tubing of the length necessary to run a direct and continuous line from the main to the meter at property line. The service tubing shall be manufactured from very high molecular weight polyethylene as PE 4710; the material cell classification shall be 445574E as defined by ASTM D-3350; and it shall bear the name of the National Sanitation Foundation Testing Laboratory

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Seal for potable water. Tubing dimensions shall be copper tubing size in accordance with the provisions of ASTM D-2737. Tubing shall be SDR 9, rated for 200 psi working pressure and shall be covered by a lifetime warranty. The service tubing shall be Endopure PE-4710 by Endot Industries, Inc. Special care shall be taken to protect the service tubing (with earthen materials) from sharp and/or hard objects. Cover is to be at least 30 inches at all points. Rigid liners (inserts) shall be used with PE tubing where compression connections are made. Liners shall be stainless steel as manufactured by Mueller Co., Part #504281 or #504385.

16.4.2 Where indicated on the Drawings, copper or brass service line shall be utilized. Service line tubing for 1-inch copper connections shall be Type K. Service line for 1 1/2- and 2-inch connections shall be stick brass, field threaded to appropriate lengths.

16.4.3 Where it is necessary to cross a street, highway, or railroad, the CONTRACTOR shall install service tubing under said street, highway, or railroad by the method indicated on the Drawings and the Bid Form. Such service line shall be installed at least 4 feet under the surface. Road crossings for both 5/8-inch x 3/4-inch and 1-inch meters shall be made with 1-inch tubing as shown on the standard detail sheet.

17. Highway and/or Railroad Crossings (Water Mains)

17.1 All water line crossings of County, State and United States Highways, and/or railroads, shall be in smooth wall steel casing pipe (0.25-inch minimum wall thickness). Joints in casing pipe shall be welded continuously all around. The minimum depth of cover shall be 42 inches for highway and road crossings, as measured from the top of the casing pipe to the low point of the crossing cross section. The minimum depth of cover shall be 48 inches, as measured from the top of the casing pipe to the low point of the crossing cross section and 66 inches as measured from the top of the casing pipe to the bottom of the rails for railroad crossings. Carrier pipe used inside steel casing shall generally be the material shown on the Drawings and the Bid Schedule. Where PVC carrier pipe is used, and for bores beneath railroads the carrier pipe shall be supported on casing spacers (Advance, Calpico, CCI, or approved equal) inside the casing at intervals that are in accordance with the spacer manufacturer's recommendations. Casing spacers for ductile iron pipe shall be Advance Model SI.

17.2 The spacer manufacturer shall be supplied the following information when ordering the spacers: carrier pipe O.D., carrier pipe bell O.D., casing pipe I.D., type of pipe being used and SDR information. All carrier pipe shall be centered with maximum clearance of 1-inch between spacer runner and casing. For PVC carrier, the spacer shall be a polyethylene spacer and for DIP carrier the spacer shall be a stainless steel spacer. The CONTRACTOR shall also supply end seals for all steel casings. End seals may be pull-on or wrap around types with stainless steel bands.

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17.3 Split casing for ductile iron pipe shall be sized to match existing casing. The two sides of the split casing shall be field butt welded one to the other and to existing casing to provide a water-tight seal. Lugs shall be provided as required to provide for proper pipe alignment. All appurtenances shall be provided as indicated above.

18. Air Release Stations

18.1 Automatic air release stations shall be located and constructed as shown on the Drawings and the Standard Detail Sheet. The Air Release Stations shall include an Apco Model 200A, or approved equal. The valve shall be supplied with a 2-inch NPT inlet, 5/32-inch orifice, and be complete with a blow-off valve. Inlet valve shall be a 2-inch ball valve as specified below.

18.2 Manual air release stations shall include a 2-inch ball valve and 10-feet of polybutylene tubing. The tubing shall be connected to the ball valve by a Mueller IP x PE Adaptor. Ball valves shall be Apollo, or approved equal, with bronze body and 316 stainless steel ball and stem.

18.3 All piping, nipples and fittings used in air release stations shall be brass. Saddles shall be Power Seal model 3416AS.

19. Inspection of the Lines

Before the CONTRACTOR backfills any of the lines, they first shall be inspected by the ENGINEER's Representative and the ENGINEER's Representative shall give the CONTRACTOR permission to proceed with the backfilling. If any joints, pipes, fittings, or materials or workmanship are found to be defective, they shall be removed and replaced by the CONTRACTOR without any additional compensation.

20. Connecting to the Existing Lines

20.1 Work under this item shall include the connecting of new water lines to the existing water lines in the manner shown on the Drawings, and as directed by the ENGINEER. The work of connecting new lines to existing lines is not a separate pay item under this Contract.

20.2 Where such a connection will result in an interruption of service, the CONTRACTOR shall propose the schedule for such a connection to the ENGINEER several days in advance. The ENGINEER will present the proposal to the OWNER for approval. The interest of the OWNER in regards to service to existing customers shall take precedence over the new construction. The CONTRACTOR's schedule shall permit the OWNER to provide notification to customers at least 24 hours before the suspension of service.

21. Disinfection and Flushing of the Lines

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21.1 The new water lines shall not be placed in service either temporarily or permanently until they have been disinfected thoroughly in accordance with the following requirements to the satisfaction of the ENGINEER.

21.2 After pressure testing procedures have been completed, the CONTRACTOR shall flush the line thoroughly, removing all foreign material, dirt, etc. Then a solution of hypochlorite using HTH or equal, sufficient to insure a chlorine dosage of at least 50 parts per million through the entire length of the line, shall be introduced into the line.

21.3 The chlorine solution shall remain in the line for 24 hours and a residual of at least 25 parts per million should be present in the pipe at the end of the 24-hour period. The line shall be flushed until 2 parts per million chlorine residual remains, then bacteriological samples taken. One sample shall be taken per mile of pipeline with a minimum of 2 samples per line. Each sample shall be collected from a different point along the line. If negative samples are obtained, the lines may be put into service. If a positive sample is obtained however, the disinfection procedure shall be repeated until negative samples are obtained. Bacteriological test costs shall be paid by the CONTRACTOR.

21.4 Disinfection, pressure testing, other required testing and flushing are not pay items. The CONTRACTOR shall pay for all water used for testing, disinfection, and flushing, except the amount required to fill the pipelines twice. This amount will be computed and deducted from the total amount metered.

21.5 The CONTRACTOR shall install a temporary bypass with a meter around a valve at the point of connection to the existing water system. This meter will be for the purpose of measuring water used by the CONTRACTOR for flushing, testing, and disinfecting the new water lines. The meter shall be large enough to pass the required flows. It shall be tested for accuracy before being installed.

22. Rough Grade Work and Cleanup

22.1 Rough Grade Work and Cleanup (Rough Cleanup) shall be defined to include the final backfill and windrowing of the ditch line, disposal of excess excavated material, level grading of the disturbed areas adjacent to the ditch line, filling and leveling street and driveway cuts, cleaning up and removal of rubbish, repair of fences and structures, and any other such work that may be required to result in a neat, orderly project area. Rough Cleanup shall be performed as other construction progresses and must be completed within one week of the adjacent pipeline construction.

22.2 Rough Cleanup is not a separate pay item. The cost for this work shall be included in the unit bid price for water lines. If Rough Cleanup is not performed as specified, the OWNER will require deductions from partial payment estimates in accordance with the Supplemental General Conditions, Sections 3.3 and 18.

23. Final Cleanup

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23.1 Final cleanup, grade work and seeding shall be performed on each line when backfilled trenches have had adequate time to settle, but at least within 2 months from the date each line is constructed. Final grade work and seeding on Kentucky Bureau of Highways rights-of-way shall be done in accordance with said Bureau's specifications and the permit granted to the OWNER specifically for this project.

23.2 Where work was performed on private property in lawns, earth of good quality, free from rock shall be spread over the disturbed area and graded and compacted to match adjacent ground contours. The previously removed topsoil shall be used for the final layer of backfill to facilitate productive growth of lawns, crops, and other vegetation. The graded area shall be hand raked until smooth and free from rock, potholes, and humps. The disturbed area shall then be seeded with the seed variety used on the original lawn (e.g., a bluegrass lawn shall be reseeded with bluegrass seed) and the seed raked in lightly. The seeded area shall be fertilized and then uniformly covered with straw to a depth of approximately 1 1/2 inches. **Final Cleanup in lawns must be completed within 2 weeks after Rough Cleanup.**

23.3 Where work was performed on private property and not in lawns the trench line shall be graded and filled if necessary to match adjacent contours. All rock larger than 1 1/2 inches in diameter shall be removed from the disturbed area. The previously removed topsoil shall be used for the final layer of backfill to facilitate productive growth of lawns, crops, and other vegetation. In general, pasture and fallow land shall be fertilized and seeded with Kentucky 31 Fescue and plowed fields shall be left unseeded, however, the desire of each property owner shall govern regarding seeding. Disturbed areas not in lawns are not required to be strawed unless erosion problems are anticipated by the ENGINEER.

23.4 In all cases on private property the rate of seed and fertilizer application shall be that recommended by the University of Kentucky Cooperative Extension Service for new plantings of the variety of grass seed used.

23.5 If the trench line settles following final grade work or if grass seed fails to germinate within a reasonable time, the CONTRACTOR shall regrade or reseed the area in question as specified above and as directed by the ENGINEER.

23.6 Final cleanup is **not** a separate pay item.

24. 6" Fire Meter Vault

24.1. General

The CONTRACTOR shall furnish all labor, materials, equipment, and services for the installation of fire meter vaults as shown on the Drawings. The CONTRACTOR shall submit shop drawings for all equipment and

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material including precast concrete, hatch, piping, valves, fittings, and meter. Generally, materials shall be as specified herein.

24.2 Access Hatch

24.2.1 Vault hatches shall be sized and located as shown on the Drawings. The hatches shall be of non-skid design and designed to handle a weight of 300-pounds per square foot. A vandal proof locking device shall be provided. A positive hold open bar shall be provided to secure the hatch in the open position. Stainless steel bolts for mounting each rail support plate shall be furnished so that each set of guide rails can mount directly to the access hatch. The access hatches shall be manufactured by Bilco, US Foundry, or approved equal.

24.2.2 All hinges and hinge bolts shall be stainless steel. All hinge bolt nuts shall be tack welded to prevent removal of bolts. All fasteners used on the hatches shall be non-corrosive. All areas of hatch frames that will be in contact with concrete shall be coated with bitumastic paint.

24.3. Meter

24.3.1 Fire meter assemblies shall consist of a strainer, a 6-inch turbo type meter with AWWA class II measuring chamber, a check valve with by-pass piping, valves, and a 2-inch turbo type meter. The fire meter assembly shall be designed to measure both low flow domestic use and high volume usage, such as when a building's fire sprinklers are activated, through a single water supply line.

24.3.2 The strainer shall be at least six times open area and shall be rated for fire series systems to prevent clogging. The strainer shall be equipped with a 3-inch flushing port for flushing debris from the upstream side of the strainer screen.

24.3.3 Water shall flow into the meter's measuring element, contacting a multi-vaned rotor. Flow readings shall be obtained by rotor revolutions transmitted by magnetic drive coupling through the meter's cover plate to a sealed register. The meter shall register in Gallons and include a thermoplastic shroud and lid. The register shall be the ADE type and include "BadgerTouch" factory wired with 5 feet of cable pit assembly.

24.3.4 The check valve shall be the downstream side spring-loaded type to hold the clapper in a normally closed position. Small water flows by-pass the clapper and are registered on the 2-inch bypass meter. When a larger flow is required, the water pressure will overcome the mechanical advantages of the spring loaded clapper and push it open, permitting full pipe capacity flow.

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24.3.5 The bypass line shall consist of piping with a 2-inch turbo type meter, two isolation valves, and back flow preventing check valve.

24.3.6 The fire meter assembly shall be Badger Meter Model FSAA-01, or approved equal. The size shall be 6-inch with 2-inch bypass meter.

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 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 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 ground level 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. 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. 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. 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. 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. 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 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.

PROJECT MANUAL

DOCUMENTS AND SPECIFICATIONS

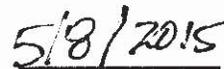
KYTC US 31W Utility Relocation Three Lane Widening from I-65

City of Franklin, Kentucky

Approved by:



Kenton Powell, City Manager



Date

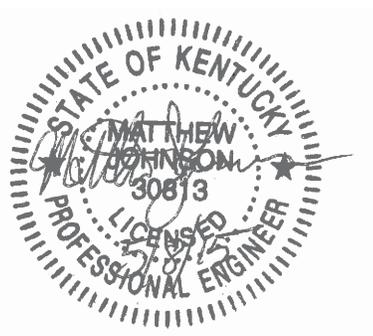
FILE NO.: 31976-29

DATE: May 2015

SECTION 00 01 05 - CERTIFICATIONS

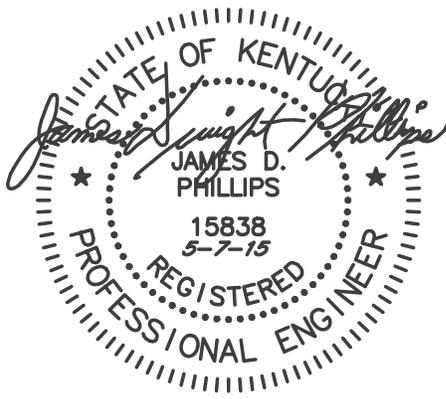
The following licensed professionals are responsible for the various portions of the project manual by which their seal is affixed:

DIVISION 01: GENERAL REQUIREMENTS
DIVISION 33: UTILITIES



Matthew Thomas Johnson, P.E.

DIVISION 26: ELECTRICAL



James D. Phillips, PE

END OF SECTION 00 01 05

SECTION 00 01 10

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APPENDIX

City of Franklin, Kentucky – Standard Specifications for Pressure and Gravity Sewer

SECTION 01 22 00 – MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contract Unit or Lump Sum Bid Amounts shall be payment in full for furnishing all resources (materials, labor, equipment, etc.) necessary to install and complete each portion of the project in complete accordance with the requirements of the Drawings and Specification-Contractual Documents. The Contract Bid Amounts shall include the cost of completing all work described under each bid item description and all necessary incidental work not included or listed as a separate bid item. Incidental work may include, but not be limited to, all necessary site work, excavation, earthwork, backfilling, demolition, sheeting, shoring, piling, bracing, dewatering, well pointing, clearing, grubbing, erosion control, locating all utilities, repairing or replacing damaged facilities, restoration, grassing, disposal of excess materials, traffic/pedestrian control in accordance with the regulations of all authorities or agencies having jurisdiction over the work areas, permitting, permit compliance, etc.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 UNIT PRICE ITEMS

A. PVC 6-Inch Force Main

- 1. The basis of payment for this item shall be linear foot and shall be the horizontal length of sewer installed complete in place as measured along the centerline of the pipe starting and ending at the centerline of the manhole, edge of pavement, and/or end of casing.
- 2. The unit price per linear foot paid for installation of 6-inch diameter force main sewer pipe will be full compensation for all labor, materials, tools, equipment, force main pipe, concrete thrust blocking, testing, supervision, surface restoration, other accessories, or incidentals necessary to complete the sanitary sewer installation that is shown on the drawings or specified in the Contract Documents.

B. Installation Of 4-Foot Inside Diameter Sewer Manhole

- 1. The basis of payment for this item shall be per each. Manhole depth shall be measured from finished casting elevation to invert of outlet pipe.
- 2. The unit price per each paid for installation of 4-foot inside diameter sewer manhole will be full compensation for all manholes from a depth equal up to six feet from the manhole invert to the rim elevation, manhole adapters, manhole frame and cover, labor, materials, surface restoration, tools, equipment, supervision, testing, and other accessories or incidentals necessary to perform and successfully complete the manhole installation.

- C. Installation Of Additional Sidewall Over 6-foot depth in a 4-Foot Inside Diameter Sewer Manhole
1. The basis of payment for this item shall be per vertical foot. The quantity paid will be for each additional vertical foot of sidewall installed over the 6-foot depth in a 4-foot inside diameter sewer manhole. Manhole depth shall be measured from finished casting elevation to invert of outlet pipe. Measurement for this pay item shall be for footage above 6-feet in depth.
 2. The unit price per each paid for installation of vertical feet of sidewall completed will be full compensation for all labor, materials, tools, equipment, surface restoration, supervision, testing, and other accessories or incidentals necessary to perform and successfully complete the manhole installation.
- D. Installation Of New 4-Foot Inside Diameter Sewer Manhole Over Existing Sewer
1. The basis of payment for this item shall be per each. Manhole depth shall be measured from finished casting elevation to invert of outlet pipe.
 2. The unit price per each paid for installation of new 4-foot inside diameter sewer manhole over existing sewer will be full compensation for all manholes from a depth equal up to six feet from the manhole invert to the rim elevation, manhole adapters, manhole frame and lid, labor, materials, tools, equipment, surface restoration, supervision, testing, and other accessories or incidentals necessary to perform and successfully complete the manhole installation.
- E. Installation Of Additional Sidewall Over 6-foot depth in a New 4-Foot Inside Diameter Sewer Manhole Over Existing Sewer
1. The basis of payment for this item shall be per vertical foot. The quantity paid will be for each additional vertical foot of sidewall installed over the new 6-foot depth in a 4-foot inside diameter sewer manhole over existing sewer. Manhole depth shall be measured from finished casting elevation to invert of outlet pipe. Measurement for this pay item shall be for footage above 6-feet in depth.
 2. The unit price per each paid for installation of vertical feet of sidewall completed will be full compensation for all labor, materials, tools, equipment, supervision, testing, and other accessories or incidentals necessary to perform and successfully complete the manhole installation.
- F. Connect Force Main to Manhole
1. The basis of payment for this item shall be each.
 2. The unit price per each paid for connect force main to manhole will be full compensation for coring existing manhole, all manhole adapters, labor, materials, tools, equipment, supervision, testing, and other accessories or incidentals necessary to perform and successfully complete the connection of force main to manhole.

G. Connect Gravity Pipe to Existing Manhole

1. The basis of payment for this item shall be each.
2. The unit price per each paid for connect gravity pipe to existing manhole will be full compensation for coring existing manhole, all manhole adapters, labor, materials, tools, equipment, supervision, testing, and other accessories or incidentals necessary to perform and successfully complete the connection of gravity pipe to existing manhole.

H. Reconnect Lateral to Manhole

1. The basis of payment for this item shall be each.
2. The unit price per each paid for reconnecting lateral to existing manhole will be full compensation for coring existing manhole, all manhole adapters, labor, materials, tools, equipment, supervision, testing, and other accessories or incidentals necessary to perform and successfully complete the connection of the lateral to the existing manhole.

I. Installation Of 8-Inch Diameter Gravity Sewer Pipe

1. The basis of payment for this item shall be linear foot and shall be the horizontal length of sewer installed complete in place as measured along the centerline of the pipe starting and ending at the centerline of the manhole, edge of pavement, and/or end of casing.
2. The unit price per linear foot paid for installation of 8-inch diameter gravity sewer pipe will be full compensation for all labor, materials, tools, equipment, surface restoration, testing, supervision, other accessories, or incidentals necessary to complete the sanitary sewer installation that is shown on the drawings or specified in the Contract Documents.

J. Installation Of 10-Inch Diameter Gravity Sewer Pipe

1. The basis of payment for this item shall be linear foot and shall be the horizontal length of sewer installed complete in place as measured along the centerline of the pipe starting and ending at the centerline of the manhole, edge of pavement, and/or end of casing.
2. The unit price per linear foot paid for installation of 10-inch diameter gravity sewer pipe will be full compensation for all labor, materials, tools, equipment, surface restoration, testing, supervision, other accessories, or incidentals necessary to complete the sanitary sewer installation that is shown on the drawings or specified in the Contract Documents.

K. Installation Of 10-Inch Diameter Ductile Iron Gravity Sewer Pipe in 20-Inch Diameter Steel Casing Pipe By Jack And Bore Under Highway 31-W

1. The basis of payment for this item shall be linear foot. Measurement shall be made from bulkhead to bulkhead along the centerline of casing.
2. The unit price per linear foot paid for installation of 10-inch diameter ductile iron gravity sewer pipe in 20-inch diameter steel casing pipe by jack and bore under Highway 31-W will be full compensation for all labor, materials, tools, equipment, construction staging area, carrier pipe, casing pipe, casing spacers, end seals, spoil handling and disposal, surface restoration, testing, supervision, other accessories, or incidentals necessary to complete the sanitary sewer installation that is shown on the drawings or specified in the Contract Documents.
3. No payment shall be made for incomplete or unacceptable borings, for realignment, or for increased length for the convenience of the Contractor.

L. Installation Of 10-Inch Diameter Ductile Iron Gravity Sewer Pipe in 20-Inch Diameter Steel Casing Pipe By Open Cut

1. The basis of payment for this item shall be linear foot. Measurement shall be made from bulkhead to bulkhead along the centerline of casing.
2. The unit price per linear foot paid for installation of 10-inch diameter ductile iron gravity sewer pipe in 20-inch diameter steel casing pipe by open cut will be full compensation for all labor, materials, tools, equipment, construction staging area, carrier pipe, casing pipe, casing spacers, end seals, geotextile fabric, spoil handling and disposal, surface restoration, testing, supervision, other accessories, or incidentals necessary to complete the sanitary sewer installation that is shown on the drawings or specified in the Contract Documents.
3. No payment shall be made for incomplete or unacceptable borings, for realignment, or for increased length for the convenience of the Contractor.

M. Ductile Iron Fittings

1. The basis of payment for this item shall be per pound.
2. The unit price per each paid for installation of ductile iron fittings will be full compensation for all labor, materials, tools, equipment, fittings, gaskets, testing, supervision, surface restoration, other accessories, or incidentals necessary to complete the installation that is indicated on the drawings or specified in the Contract Documents.

N. Cut and Cap Existing Force Main

1. The basis of payment for this item shall be per each.
2. The unit price per each paid for cutting and capping existing force main that is to be abandoned will be full compensation for all labor, materials, tools, equipment, supervision, other accessories, or incidentals necessary to cut and cap the line for abandonment that is indicated on the drawings or specified in the Contract Documents.

O. Cut and Cap Existing Gravity Sewer

1. The basis of payment for this item shall be per each.
2. The unit price per each paid for cutting and capping existing gravity sewer that is to be abandoned will be full compensation for all labor, materials, tools, equipment, supervision, other accessories, or incidentals necessary to cut and cap the line for abandonment that is indicated on the drawings or specified in the Contract Documents.

P. Abandon and Remove Existing Manhole

1. The basis of payment for this item shall be per each.
2. The unit price per each paid for remove existing manholes will be full compensation for all labor, materials, tools, equipment, testing, supervision, disposal of manhole, backfill, other accessories, or incidentals necessary to complete the installation that is indicated on the drawings or specified in the Contract Documents.
3. Castings and manhole lids shall be returned to the City of Franklin.

Q. Abandon and Demolish Wastewater Pump Station

1. The basis of payment for this item shall be lump sum.
2. The lump sum price paid for abandoning and demolishing existing pump station will be full compensation for all labor, materials, tools, equipment, testing, supervision, disposal of materials, backfill, other accessories, or incidentals necessary to complete the abandonment that is indicated on the drawings or specified in the Contract Documents.

R. New Wastewater Pump Station

1. The basis of payment for this item shall be lump sum and shall include all items within the limits of the pump station property lines.
2. The lump sum price paid for installation of new pump station will be full compensation for all labor, materials, tools, equipment, package pump station, generator, fencing, testing, supervision, other accessories, or incidentals necessary to complete the installation that is indicated on the drawings or specified in the Contract Documents.

S. Installation Of 6-inch by 6-inch Diameter Tapping Sleeve and Valve with Line Stop

1. The basis of payment for this item shall be per each.
2. The unit price per each paid for installation of tapping sleeve and valve with line stop will be full compensation for all labor, materials, tools, equipment, tapping sleeve, valve, line stop, testing, supervision, other accessories, or incidentals necessary to complete the installation that is indicated on the drawings or specified in the Contract Documents.

T. Creek Crossing

1. The basis of payment for this item shall be linear foot. Measurement shall be made from end of concrete encasement to end of concrete encasement.
2. The unit price per linear foot paid for installation of creek crossing will be full compensation for all labor, materials, tools, equipment, construction staging area, concrete encasement, gravity sewer pipe, testing, supervision, other accessories, or incidentals necessary to complete the creek crossing installation that is shown on the drawings or specified in the Contract Documents.

U. Watertight Frame and Lid

1. The basis of payment for this item shall be per each.
2. The unit price per each paid for installation of watertight frame and lid will be the cost difference from the 4 foot diameter sewer manhole with standard frame and lid and will be full compensation for all labor, materials, tools, equipment, watertight frame and lid, or incidentals necessary to complete the installation that is shown on the drawings or specified in the Contract Documents.

V. Connect to 2-inch Force Main

1. The basis of payment for this item shall be per each.
2. The unit price per each paid for connection to 2-inch force main will be full compensation for all labor, materials, tools, equipment, testing, supervision, other accessories, or incidentals necessary to complete the connection to 2-inch force main that is indicated on the drawings or specified in the Contract Documents.

W. PVC 2-inch Sewer Force Main

1. The basis of payment for this item shall be linear foot and shall be the horizontal length of sewer installed complete in place as measured along the centerline of the pipe starting and ending at the centerline of the manhole, edge of pavement, and/or end of casing.
2. The unit price per linear foot paid for installation of 2-inch diameter force main sewer pipe will be full compensation for all labor, materials, tools, equipment, force main pipe, concrete thrust blocking, testing, supervision, surface restoration, other accessories, or incidentals necessary to complete the sanitary sewer installation that is shown on the drawings or specified in the Contract Documents.

X. Installation Of 2-Inch Diameter PVC Force Main Sewer Pipe in 6-Inch Diameter Steel Casing Pipe By Open Cut

1. The basis of payment for this item shall be linear foot. Measurement shall be made from bulkhead to bulkhead along the centerline of casing.
2. The unit price per linear foot paid for installation of 2-inch diameter PVC force main sewer pipe in 6-inch diameter steel casing pipe by open cut will be full compensation for all labor, materials, tools, equipment, construction staging area, carrier pipe, casing pipe, casing spacers, end seals, geotextile fabric, spoil handling and disposal, surface restoration, testing, supervision, other accessories, or incidentals necessary to complete the sanitary sewer installation that is shown on the drawings or specified in the Contract Documents.

Y. No payment shall be made for incomplete or unacceptable borings, for realignment, or for increased length for the convenience of the Contractor.Sewer Flow Control

1. No separate measurement or payment will be made for sewer flow control. It shall be considered and designated a necessary part of the construction and unit prices bid for items with which erosion control is required. The unit prices shall be full compensation for this item and for all labor, materials and equipment required to complete the item in accordance with the Drawings and Specifications.

Z. Erosion And Sedimentation Control

1. No separate measurement or payment will be made for erosion and sediment control. It shall be considered and designated a necessary part of the construction and unit prices bid for items with which erosion control is required. The unit prices shall be full compensation for this item and for all labor, materials and equipment required to complete the item in accordance with the Drawings and Specifications.

AA. Protection, Relocation And Restoration Of Existing Utilities

1. No separate measurement or payment will be made for protection, relocation and restoration of existing utilities. It shall be considered and designated a necessary part of the construction and unit prices bid for items with which protection, relocation and restoration of existing utilities is connected. The unit prices shall be full compensation for this item and for all labor, materials and equipment required to complete the item in accordance with the Drawings and Specifications.

END OF SECTION 01 22 00

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action.
- B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements.
- C. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Engineer's Digital Data Files: Electronic digital data files of the Contract Drawings will not be provided by Engineer for Contractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 - 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 - 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 10 working days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 10 working days for review of each resubmittal.
- D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
 3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Engineer.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of subcontractor.
 - g. Name of supplier.
 - h. Name of manufacturer.
 - i. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06 10 00.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06 10 00.01.A).
 - j. Number and title of appropriate Specification Section.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Other necessary identification.
 4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
 5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer will return without review submittals received from sources other than Contractor.
 - a. Transmittal Form for Paper Submittals: Use CSI Form 12.1A.

- E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
 - 1. Transmittal Form for Electronic Submittals: Use electronic form acceptable to City of Franklin.
- F. Options: Identify options requiring selection by Engineer.
- G. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from Engineer's action stamp.
- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- J. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Engineer's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Submit electronic submittals via email as PDF electronic files.
 - a. Engineer will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 - 2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
 - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.

- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before or concurrent with Samples.
 6. Submit Product Data in the following format:
 - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Submit Shop Drawings in the following format:
 - a. PDF electronic file.
- D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
 5. Submit product schedule in the following format:
 - a. PDF electronic file.
- E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of Engineers and owners, and other information specified.
- F. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- G. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- H. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- I. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- J. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- K. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- L. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- M. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- N. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

- O. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- P. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ENGINEER'S ACTION

- A. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or revisions required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Engineer.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may be returned by the Engineer without action.

END OF SECTION 01 33 00

SECTION 01 78 00 - CLOSEOUT SUBMITTALS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. This section applies to work related to the installation of City of Franklin sanitary sewer system infrastructure.
- B. Accurate record documents related to the furnishing and installation of equipment, materials, and products at the site of the project during the course of the work.
- C. Operations and Maintenance Manuals
- D. Warranties

1.2 MAINTENANCE OF RECORD DOCUMENTS

- A. The Contractor shall maintain at the project site one (1) record copy of each of the following:
 - 1. Contract Drawings
 - 2. Specifications
 - 3. Addenda
 - 4. Reviewed Shop Drawings
 - 5. Change Orders and Other Modifications to Contract Documents
 - 6. Field Test Records
 - 7. Survey Data
 - 8. Field Orders
- B. The Owner will furnish one set of reproducible Construction Drawings to the Contractor at the time construction is commenced. These drawings shall be marked-up by each Contractor, throughout the construction period, indicating all changes, revisions and additions to the work, including field relocations of work concealed from view.
- C. Project record documents shall be maintained in a clean, dry, legible condition and shall not be used for construction purposes.
- D. Record documents shall not be used for any other purpose and shall not be removed from the site without Owner's approval.

1.3 RECORDING

- A. The Contractor shall label each document “Project Record” in one-inch high letters. Record Documents shall be kept current and work shall not be permanently concealed until the required information had been recorded.
- B. The Contractor shall field survey vertical and horizontal positioning of actual constructed assets and appurtenances. All surveys shall be performed by a registered surveyor to include the following:
 - 1. GPS coordinates, top elevation, and depth to invert of each Air release valve vault, valve, and tunnel or boring start and end points. GPS coordinates and invert depth of major fittings (i.e., bends and tees).
 - 2. GPS coordinates and vertical location of underground utilities, utility structures and appurtenances.
 - 3. GPS coordinates and rim and invert elevations for all manholes or junction boxes. All sanitary sewer manholes, conveyances, pressurized mains and lift stations should be located by the center. English units and NAD 83 State Plane Coordinates shall be used.
- C. The Contractor shall submit all field survey data associated with construction at the time of submittal of the markup drawings. Each submittal of markup drawings and associated field survey data shall represent the constructed assets for that period of time described in the construction schedule and/or the Contractor’s payment request. The Contractor shall submit all field survey data in a standardized, comma-delimited text file (or.CSV) to include, at a minimum, the following fields:

Point Number	Northing	Easting	Elevation	Invert	Description	Comment
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- 1. Point Number: unique identifier for each point (alphanumeric, numeric)
- 2. Northing: geographic coordinate for each point (numeric)
- 3. Easting: geographic coordinate for each point (numeric)
- 4. Elevation: z value for point (numeric)
- 5. Invert: z value for point (if applicable) (numeric)
- 6. Description: point description, name of asset (text, alphanumeric)
- 7. Comment: additional description, name of asset (alphanumeric)

- D. The Contractor shall also submit survey data in AutoCAD 2013 format.
- E. Contract Drawings: The Contractor shall legibly mark to record the actual construction on the project record set of prints of the Contract Drawings, including reviewed shop drawings, the following:
 - 1. Horizontal and vertical location of underground utilities and appurtenances referenced to mean sea level or permanent surface improvements.
 - 2. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
 - 3. Field changes of dimension and detail, including elevations of foundations.
 - 4. Changes made by change order or field order.
 - 5. Details not on original Drawings.

- F. Specifications and Addenda: The Contractor shall legibly mark up each section to record:
 - 1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
 - 2. Changes made by change order or field order.
 - 3. Other matters not originally specified.
- G. Shop Drawings: Maintain as record documents and legibly annotate drawings to record changes made after review.
- H. Contractor shall not permanently conceal any Work until required information has been surveyed and recorded.
- I. Record documents and field survey submittals are subject to review by the Owner on a monthly basis. Failure to keep record documents and field survey data accurate, current and submitted will be basis for the Owner to withhold the Contractor's monthly payment in part or full.

1.4 SUBMITTAL OF RECORD DOCUMENTS

- A. At project completion, deliver record documents to the Owner. Place all letter-sized material in a three (3) ring binder which is neatly indexed by process and division number. Bind Contract drawings and shop drawings in rolls of convenient size for ease of handling. The Contractor shall provide an electronic copy of all final record documents to the Owner.
- B. Accompany the submittal with a transmittal letter in duplicate containing the following:
 - 1. Date.
 - 2. Project title and number.
 - 3. Contractor's name and address.
 - 4. Title and number of each record document.
 - 5. Certification that each document as submitted is complete and accurate.
 - 6. Signature of Contractor.
- C. Owner will review final submittals within fifteen (15) working days of receipt from Contractor. Owner will provide Contractor with itemized listing and/or copies of submittals that require further investigation or measurements from Contractor. Contractor shall provide required data to Owner for approval prior to release of final payment and release of all retainage.

1.5 OPERATION AND MAINTENANCE DATA

- A. Submit two sets prior to final inspection, bound in 8-1/2 x 11 inch three D side ring binders with durable plastic covers.
- B. Prepare binder covers with printed title "Operation and Maintenance Instructions", title of project, and subject matter of binder when multiple binders are required.

- C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
 - D. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, print on 30 pound white paper.
 - E. Part 1: Directory, listing names, addresses, email addresses, and telephone numbers of Engineer, Contractor, Subcontractors, and major equipment suppliers.
 - F. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - 1. Significant design criteria.
 - 2. List of equipment.
 - 3. Parts list for each component.
 - 4. Operating instructions.
 - 5. Maintenance instructions for equipment and systems.
 - G. Part 3: Project documents and certificates including the following:
 - a. Shop drawings and product data.
 - b. Certificates.
 - c. Photocopies of warranties.
 - H. Submit one copy of completed volumes in final form 15 days prior to final inspection. This copy will be returned with Engineer comments. Revise contents of documents based upon Operator training as required prior to final submittal.
 - I. Submit final volumes revised, within ten days after final inspection.
- 1.6 WARRANTIES
- A. A minimum one (1) year warranty shall be provided for all work related to the City of Franklin sewer system infrastructure. The warranty period shall begin upon the date of acceptance of the Work by the City.
 - B. Provide duplicate notarized copies.
 - C. Execute and assemble documents from Subcontractors, suppliers, and manufacturers.
 - D. Provide Table of Contents and assemble in three D side ring binder with durable plastic cover.
 - E. Submit prior to final Application for Payment.
 - F. For items of WORK delayed beyond date of Substantial Completion, provide updated submittal within ten (10) days after acceptance, listing date of acceptance as start of warranty period.

1.7 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual Specification sections.
- B. Deliver to Project site and place in location as directed by Owner; obtain receipt prior to final payment.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF DOCUMENT 01 78 00

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 REFERENCES

- A. ASTM E1971 - Stewardship for the Cleaning of Commercial and Institutional Buildings

1.2 SUBMISSION OF OPERATION AND MAINTENANCE DATA

- A. Submit Operation and Maintenance (O&M) Data specifically applicable to this contract and a complete and concise depiction of the provided equipment, product, or system, stressing and enhancing the importance of system interactions, troubleshooting, and long-term preventative maintenance and operation.
 - 1. The subcontractors must compile and prepare data and deliver to the Contractor prior to the training of Owner's personnel.
 - 2. The Contractor must compile and prepare aggregate O&M data including clarifying and updating the original sequences of operation to as-built conditions.
 - 3. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal.
- B. Package Quality: Documents must be fully legible. Poor quality copies and material with hole punches obliterating the text or drawings will not be accepted.
- C. Package Content: Data package content shall be as shown in the paragraph titled "Schedule of Operation and Maintenance Data Packages." Comply with the data package requirements specified in the individual technical sections, including the content of the packages and addressing each product, component, and system designated for data package submission.
- D. Changes to Submittals: Manufacturer-originated changes or revisions to submitted data must be furnished by the Contractor if a component of an item is so affected subsequent to acceptance of the O&M Data. Submit changes, additions, or revisions required by the Engineer for final acceptance of submitted data within 30 calendar days of the notification of this change requirement.
- E. Provide copies in hard copy and on a CD/DVD in pdf format.

1.3 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

- A. Operating Instructions: Include specific instructions, procedures, and illustrations for the following phases of operation for the installed model and features of each system:
 - 1. Safety Precautions: List personnel hazards and equipment or product safety precautions for all operating conditions.
 - 2. Operator Prestart: Include procedures required to install, set up, and prepare each system

- for use.
3. Startup, Shutdown, and Post-Shutdown Procedures: Provide narrative description for Startup, Shutdown and Post-shutdown operating procedures including the control sequence for each procedure.
 4. Normal Operations: Provide narrative description of Normal Operating Procedures. Include Control Diagrams with data to explain operation and control of systems and specific equipment.
 5. Emergency Operations: Include Emergency Procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment.
 6. Include Emergency Shutdown Instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance and procedures for emergency operation of all utility systems including required valve positions, valve locations and zones or portions of systems controlled.
 7. Operator Service Requirements: Include instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and recording gage readings.
 8. Environmental Conditions: Include a list of Environmental Conditions (temperature, humidity, and other relevant data) that are best suited for the operation of each product, component or system. Describe conditions under which the item equipment should not be allowed to run.
- B. Preventive Maintenance: Include the following information for preventive and scheduled maintenance to minimize corrective maintenance and repair for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.
1. Lubrication Data: Include preventative maintenance lubrication data, in addition to instructions for lubrication provided under paragraph titled "Operator Service Requirements":
 - a. A table showing recommended lubricants for specific temperature ranges and applications.
 - b. Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities.
 - c. Lubrication Schedule showing service interval frequency.
 2. Preventive Maintenance Plan and Schedule: Include manufacturer's schedule for routine preventive maintenance, inspections, tests and adjustments required to ensure proper and economical operation and to minimize corrective maintenance. Provide manufacturer's projection of preventive maintenance work-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.
- C. Corrective Maintenance (Repair): Include manufacturer's recommended procedures and instructions for correcting problems and making repairs.
1. Troubleshooting Guides and Diagnostic Techniques: Include step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

2. **Wiring Diagrams and Control Diagrams:** Wiring diagrams and control diagrams shall be point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type, identically to actual installation configuration and numbering.
 3. **Maintenance and Repair Procedures:** Include instructions and a list of tools required to repair or restore the product or equipment to proper condition or operating standards.
 4. **Removal and Replacement Instructions:** Include step-by-step procedures and a list required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings and adjustments required. Instructions shall include a combination of text and illustrations.
 5. **Spare Parts and Supply Lists:** Include lists of spare parts and supplies required for maintenance and repair to ensure continued service or operation without unreasonable delays. Special consideration is required for facilities at remote locations. List spare parts and supplies that have a long lead-time to obtain.
- D. **Corrective Maintenance Work-Hours:** Include manufacturer's projection of corrective maintenance work-hours including requirements by type of craft. Corrective maintenance that requires completion or participation of the equipment manufacturer shall be identified and tabulated separately.
- E. **Appendices:** Provide information required below and information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment. Include the following:
1. **Product Submittal Data:** Provide a copy of all Product Data submittals required in the applicable technical sections.
 2. **Manufacturer's Instructions:** Provide a copy of all Manufacturer's Instructions submittals required in the applicable technical sections.
 3. **O&M Submittal Data:** Provide a copy of all Operation and Maintenance Data submittals required in the applicable technical sections.
 4. **Parts Identification:** Provide identification and coverage for all parts of each component, assembly, subassembly, and accessory of the end items subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing shall show the index, reference, or key number that will cross-reference the illustrated part to the listed part. Parts shown in the listings shall be grouped by components, assemblies, and subassemblies in accordance with the manufacturer's standard practice. Parts data may cover more than one model or series of equipment, components, assemblies, subassemblies, attachments, or accessories, such as typically shown in a master parts catalog.
 5. **Warranty Information:** List and explain the various warranties and clearly identify the servicing and technical precautions prescribed by the manufacturers or contract documents in order to keep warranties in force. Include warranty information for primary components such as the compressor of air conditioning system.

6. Personnel Training Requirements: Provide information available from the manufacturers that is needed for use in training designated personnel to properly operate and maintain the equipment and systems.
7. Testing Equipment and Special Tool Information: Include information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components.
8. Testing and Performance Data: Include completed prefunctional checklists, functional performance test forms, and monitoring reports. Include recommended schedule for retesting and blank test forms.
9. Contractor Information: Provide a list that includes the name, address, and telephone number of the General Contractor and each Subcontractor who installed the product or equipment, or system. For each item, also provide the name address and telephone number of the manufacturer's representative and service organization that can provide replacements most convenient to the project site. Provide the name, address, and telephone number of the product, equipment, and system manufacturers.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 01 78 23

SECTION 02 41 00 - DEMOLITION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Demolition of designated structures, mechanical equipment, electrical equipment and other existing facilities.
- B. Unless otherwise noted, removal all demolition material from the project site and properly dispose of all demolition material at a location selected and provided by the Contractor.
- C. Remove and salvage electrical and mechanical equipment and facilities for delivery to the Owner for Owner's future use.
- D. Final grading and finishing of site.

1.2 PROJECT DESCRIPTION

A. Demolition Plan

- 1. General Requirements: Do not begin demolition or deconstruction until authorization is received from the Engineer. Remove rubbish and debris from the project site; do not allow accumulations. Store materials that cannot be removed daily in areas specified by the Engineer.

1.3 ITEMS TO REMAIN IN PLACE

- A. Take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Owner. Repair or replace damaged items as approved by the Engineer. Coordinate the work of this section with all other work indicated.
- B. Existing Construction Limits and Protection: Do not disturb existing construction beyond the extent indicated or necessary for installation of new construction. Provide protective measures to control accumulation and migration of dust and dirt in all work areas.
 - 1. Utility Service: Maintain existing utilities indicated to stay in service and protect against damage during demolition and deconstruction operations. Prior to start of work, utilities serving each area of alteration or removal will be shut off by the Owner and disconnected and sealed by the Contractor.
- C. Facilities:
 - 1. Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities.

1.4 QUALITY ASSURANCE

- A. Comply with federal, state, and local hauling and disposal regulations.

PART 2 - PRODUCTS

2.1 FILL MATERIAL

- A. Comply with excavating, backfilling, and compacting procedures for soils used as backfill material to fill voids, depressions or excavations resulting from demolition of structures.
- B. Fill material shall conform to the definition of satisfactory soil material as defined in AASHTO M 145, Soil Classification Groups A-1, A-2-4, A-2-5 and A-3. In addition, fill material shall be free from roots and other organic matter, trash, debris, frozen materials, and stones larger than 2 inches in any dimension.

PART 3 - EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

A. Structures

- 1. Remove existing structures indicated to be removed to 3 feet below grade.
 - a. Demolish structures in a systematic manner from the top of the structure to the ground.

B. Utilities and Related Equipment

- 1. General Requirements: Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by the Engineer. Do not begin demolition work until all utility disconnections have been made. Shut off and cap utilities for future use, as indicated.
- 2. Disconnecting Existing Utilities: Remove existing utilities uncovered by work and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Engineer. When utility lines are encountered but are not indicated on the drawings, notify the Engineer prior to further work in that area. Remove meters and related equipment and deliver to Owner in accordance with instructions of the Engineer.

C. Chain Link Fencing

- 1. Remove chain link fencing, gates and other related salvaged items scheduled for removal and transport to area designated by Owner. Remove gates as whole units. Cut chain link fabric to 25 foot lengths and store in rolls off the ground.

D. Miscellaneous Metal

1. Salvage shop-fabricated items such as access doors and frames, steel gratings, metal ladders, wire mesh partitions, metal railings, metal windows and similar items as whole units.

E. Mechanical Equipment and Fixtures

1. Disconnect mechanical hardware at the nearest connection to existing services to remain, unless otherwise noted. Disconnect mechanical equipment and fixtures at fittings. Remove service valves attached to the unit. Salvage each item of equipment and fixtures as a whole unit; listed, indexed, tagged, and stored. Salvage each unit with its normal operating auxiliary equipment. Transport salvaged equipment and fixtures, including motors and machines, to a designated storage area as directed by the Engineer.
2. Do not remove equipment until approved.
3. Preparation for Storage: Remove water, dirt, dust, and foreign matter from units; tanks, piping and fixtures shall be drained; interiors, if previously used to store flammable, explosive, or other dangerous liquids, shall be steam cleaned. Seal openings with caps, plates, or plugs. Secure motors attached by flexible connections to the unit. Change lubricating systems with the proper oil or grease.
4. Piping: Disconnect piping at unions, flanges and valves, and fittings as required to reduce the pipe into straight lengths for practical storage. Store salvaged piping according to size and type. If the piping that remains can become pressurized due to upstream valve failure, end caps, blind flanges, or other types of plugs or fittings with a pressure gage and bleed valve shall be attached to the open end of the pipe to ensure positive leak control. Carefully dismantle piping that previously contained gas, gasoline, oil, or other dangerous fluids, with precautions taken to prevent injury to persons and property. Store piping outdoors until all fumes and residues are removed. Box prefabricated supports, hangers, plates, valves, and specialty items according to size and type. Classify piping not designated for salvage, or not reusable, as scrap metal.

F. Electrical Equipment and Fixtures

1. Salvage motors, motor controllers, and operating and control equipment that are attached to the driven equipment. Salvage wiring systems and components. Box loose items and tag for identification. Disconnect primary, secondary, control, communication, and signal circuits at the point of attachment to their distribution system.
2. Fixtures: Remove and salvage electrical fixtures. Salvage unprotected glassware from the fixture and salvage separately. Salvage incandescent, mercury-vapor, and fluorescent lamps and fluorescent ballasts manufactured prior to 1978, boxed and tagged for identification, and protected from breakage.
3. Electrical Devices: Remove and salvage switches, switchgear, transformers, conductors including wire and nonmetallic sheathed and flexible armored cable, regulators, meters, instruments, plates, circuit breakers, panelboards, outlet boxes, and similar items. Box and tag these items for identification according to type and size.
4. Conduit and Miscellaneous Items: Salvage conduit except where embedded in concrete or masonry. Consider corroded, bent, or damaged conduit as scrap metal. Sort straight and undamaged lengths of conduit according to size and type. Classify supports, knobs, tubes, cleats, and straps as debris to be removed and disposed.

3.2 DISPOSITION OF MATERIAL

- A. Title to Materials: Coordinate with Owner items to be salvaged. Except for salvaged items coordinated with Owner, all materials and equipment removed and not reused or salvaged, shall become the property of the Contractor and shall be removed from Owner's property. Title to materials resulting from demolition, and materials and equipment to be removed, is vested in the Contractor upon approval by the Engineer of the Contractor's demolition and removal procedures, and authorization by the Engineer to begin demolition and deconstruction. The Owner will not be responsible for the condition or loss of, or damage to, such property after contract award. Showing for sale or selling materials and equipment on site is prohibited.
- B. Salvaged Materials and Equipment: Remove materials and equipment that are specified in the contract documents and coordinated with Owner to be removed by the Contractor and that are to remain the property of the Owner, and deliver to a storage site coordinated with the Owner.
 - 1. Salvage items and material to the maximum extent possible.
 - 2. Store all materials salvaged for the Contractor as approved by the Engineer and remove from Owner's property before completion of the contract. On site sales of salvaged material is prohibited.
 - 3. Remove salvaged items to remain the property of the Owner in a manner to prevent damage, and packed or crated to protect the items from damage while in storage or during shipment. Items damaged during removal or storage must be repaired or replaced to match existing items. Properly identify the contents of containers.
- C. Unsalvageable and Non-Recyclable Material: Dispose of unsalvageable and non-recyclable noncombustible material off-site in accordance with appropriate regulations.

3.4 CLEANUP

- A. Remove debris and rubbish. Remove and transport the debris in a manner that prevents spillage on streets or adjacent areas. Apply local regulations regarding hauling and disposal.

3.5 DISPOSAL OF REMOVED MATERIALS

- A. Regulation of Removed Materials: Dispose of debris, rubbish, scrap, and other non-salvageable materials resulting from removal operations in accordance with all applicable federal, state and local regulations.
- B. Removal from Government Property: Transport waste materials removed from demolished and deconstructed structures, except waste soil, from Owner's property for legal disposal. Dispose of waste soil as directed.

END OF SECTION 02 41 00

SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 GENERAL

A. Work Included

Provide all materials, labor and equipment required to furnish and install a complete electrical system as indicated on plans and as specified herein. Electrical work includes but is not limited to the following:

1. Complete distribution system for power and controls including necessary panelboard, feeders, mini power center, branch circuits and receptacle.
2. Excavation, trenching and backfilling for conduit and/or cable.
3. Grounding.
4. Installation of standby diesel engine generator system including automatic transfer switch.

The electrical contractor shall be responsible for the complete installation and start up of standby generator systems for proper operation under standby power. This includes the proper setup of all connected load control devices including main circuit breakers, solid state reduced voltage motor starters, etc.

It shall be the responsibility of the contractor to review all of the final installation instructions and shop drawings from the equipment suppliers and adjust all installations accordingly. Provide a complete and fully functional installation and system.

5. Surge protection device.

B. Related Work

The following work shall be furnished under this Section of these Specifications.

1. Flashing of conduits into roofing and outside walls.
2. Concrete reinforced steel guard posts.
3. Concrete foundations, curbs and pads.
4. Painting.
5. Cutting and patching.

C. Definitions

Provide: As used shall mean "furnish, install and connect, and put in good working order."

Wiring: As used shall mean "wire and cable, installed in raceway with all required boxes, fittings, connectors, etc. complete.

Engineer: As used in various sections shall mean "Engineer of record whose seal is affixed to the Contract Specifications and/or Plans."

D. Requirements of Regulatory Agencies

Equipment furnished shall be UL listed where such label is available. Installation shall conform to UL Standards where applicable.

Electrical work shall be installed in accordance with Plans and Specifications, edition of NEC in effect at project location, recommendations of NFPA, state and local electrical and building codes and special codes having jurisdiction over specific portions within complete installation. This includes, but is not limited to the following:

1. Kentucky Building Code.
2. 2008 National Electrical Code.

In event of conflict between Plans, Specifications and such codes, Engineer shall be notified in writing prior to bid. A ruling shall then be made by Engineer in writing.

Obtain permits and certificates of approval from all authorities having jurisdiction over installation and pay all permit and inspection fees required.

The Contractor shall make all necessary arrangements with the local Electric Utility Company concerning the electric service. The Contractor will be responsible for fees required for service modifications and extensions if and as required by the local Utility Company.

1.2 PRODUCTS

(No products specified under this Section.)

1.3 EXECUTION

A. Submittals

1. Refer to other Sections, for general requirements of shop drawing submittals. There shall be a separate submittal section or brochure for each product listed below with all sections or brochures submitted at the same time in one package. First sheet in each product section or brochure shall summarize and list all components, manufacturer's name and catalog number. Submittals shall include but not be limited to the following:

2. Submittals must be complete with all materials to be used on the project included. Partial submittals will be rejected. Submittals shall be checked by the Contractor and evidence of such checking shall be indicated thereon. **SUBMITTALS NOT BEARING THE CONTRACTOR'S MARK OF ACCEPTANCE AND APPROVAL WILL NOT BE REVIEWED BY THE ENGINEER.** The Contractor shall be completely responsible for the accuracy, completeness, compliance with Plans and Detailed Specifications and compatibility of all submittals, the Engineer's approval notwithstanding. All submittals reviewed more than twice will be billed per the Engineer's hourly rate schedule.

3. Submittals shall include but not be limited to the following:
 - a. Standby generator system.
 - b. Automatic transfer switch.
 - c. Panelboard.
 - d. Mini power center.
 - e. Conduit and device mounting support channels, fittings, and fasteners.
 - f. Conduit and fittings.
 - g. Pullboxes and junction boxes.
 - h. Wire and cable.
 - i. Grounding components.
 - j. Cable connectors and lugs.
 - k. Surge protection device.

B. Site Visit

Visit job site prior to bid date to determine actual conditions under which work shall be done, to familiarize oneself with project and to verify total scope of work required. Failure to do so shall not constitute reason for extra charge.

PART 2 - BASIC MATERIALS AND METHODS

2.1 GENERAL

A. Quality Assurance

Qualifications of Manufacturer: Products used in work of this Section shall be produced by manufacturers regularly engaged in successful manufacture of similar items and with history acceptable to Engineer.

Qualifications of Installers: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in necessary crafts and who are completely familiar with specified requirements and methods needed for proper performance of work of this Section.

2.2 PRODUCTS

A. Substitutions

Where "or equal" is included, Contractor may substitute equal products by another manufacturer subject to approval by the Engineer.

Substitution shall be approved by Engineer before purchase and/or installation. If unapproved materials are installed, work required to remove and replace unapproved items shall be done at Contractor's expense.

2.3. EXECUTION

A. Installation

Electrical plans are diagrammatic and shall not be scaled for exact sizes or locations. They are not intended to disclose absolute or unconditional knowledge of actual field conditions. This Section covers installation or relocation of outlets and miscellaneous devices shown on the Plans. Any outlet or device may be installed or relocated a maximum of 10 feet in any direction from locations shown on the Plans without additional charge to the owner.

All electrical equipment supports and conduit supports, anchors, bolts, locknuts, screws, washers, and mounting hardware including unistrut, angle iron, and structural members shall be Type 304 stainless steel.

Equipment shall be installed in accordance with manufacturer's recommendations.

Protect work and materials from damage by weather, entrance of water and dirt. Cap conduit during installation. Avoid damage to materials and equipment in place. Satisfactorily repair or remove and replace damaged work with new materials. Deliver equipment and materials to job site in original, unopened, labeled containers. Store ferrous materials to prevent rusting and finished materials and equipment to prevent staining and discoloring.

Failure to route conduit through building without interfering with other equipment and construction shall not constitute a reason for an extra charge. Equipment, conduit and fixtures shall fit into available spaces in building and shall not be introduced into building at such times and manner as to cause damage to structure. Equipment requiring service shall be readily accessible.

B. Testing and Equipment Servicing

Entire installation shall be free from improper grounds and short and open circuits. Make test on conductors as required before energizing circuit.

Make test to insure that entire system is in proper operating condition, and that adjustments and apparatus setting of circuit breakers, fuses, control equipment and apparatus have been made. Correct defects discovered during tests.

Equipment shall be turned over to Owner in lubricated condition. Instruction on further lubrication shall be included in operating instructions.

At termination of work under this Section, furnish Owner three complete bound sets of equipment catalog sheets, manufacturer's specifications and service and operating instructions on equipment furnished under this Section. Also instruct Owner on proper

usage, care and maintenance of entire electrical system including all special systems or apparatus.

C. Removal of Debris

Remove surplus materials and debris caused by, or incidental to, electrical work. Remove such debris at frequent intervals. Keep job clean during construction.

D. Salvageable Materials

The electrical contractor shall be solely responsible for the disposition of waste material. The Owner shall have rights to all salvageable material.

E. Cutting and Patching

The contractor shall so organize and execute his work so as to avoid all unnecessary cutting and patching of building surfaces. Preparatory work, including accurate installation of sleeves, wall and floor openings and construction of equipment foundations and supports shall be coordinated with the building progress. Cutting, patching and repairs to damaged building surfaces, as a result of the installation, shall be provided without additional cost to the Owner.

Certain work of a general construction nature related to the work under this section of the specifications will be provided by the contractor and will include preparation of building surfaces at points of raceway and duct penetrations, necessary masonry and concrete work, etc. The contractor shall be completely responsible for the correct dimensions and general scope of all general construction requirements related to his work. All corrections to such related work, determined to be improperly executed due to the negligence of the contractor shall be made at the contractor's expense.

F. Identification of Wire and Cable

All abandoned power, control, and signal wire and cable shall be properly insulated, terminated, and tagged as "spare" with identification as to source and destination at all locations.

All proposed power, control, and signal wire and cable shall be properly terminated and consistently numbered in all junction and pullboxes, panels, devices, and all locations where wire and cable leave raceways.

G. Identification of Equipment

Identify the following electrical equipment with laminated plastic nameplates, engraved with 1/4" high letters.

All nameplates shall be black and white letters except nameplates for emergency panelboards and transfer switches, which shall be red with white letters. Nameplates shall be attached to metal enclosure with two screws. Nameplates attached with adhesive are not acceptable.

1. Automatic transfer switch;
2. Panelboard;
3. Mini power center;

H. Record Drawings

THE CONTRACTOR SHALL MAINTAIN ONE SET OF ELECTRICAL PRINTS ON SITE, MARKED TO SHOW ACTUAL AS CONSTRUCTED CONDITIONS AND INSTALLATIONS, PRINTS TO BE TURNED OVER TO ENGINEER AFTER JOB IS COMPLETE. Installed location of all exterior buried conduit shall be accurately shown and referenced to above ground structures.

I. Temporary Lighting and Power

Provide, maintain and remove after construction is completed, temporary lighting adequate for workman safety and temporary power for all trades including any 3 phase power required with a minimum as shown on the plans.

Provide and maintain barricade lighting where required to adequately protect Owner against liability for damage to public or personnel. All lamps used in barricade shall be 70 watt red installed in weatherproof socket with wire guard. All wiring shall be approved for weatherproof installation.

J. Other Materials

Work of this Section shall also include those items not specifically mentioned or described, but which are obviously necessary to conform to the design intent, applicable codes and to produce complete electrical system that functions properly. These materials shall be as selected by Contractor but subject to approval of Engineer.

K. Guarantee-Warranty

Guarantee work to be free from defects of materials and workmanship for a period of one year from date of final acceptance of all work. Repair and replace defective work and other work damaged thereby which becomes defective during term of Guarantee-Warranty. Furnish Owner with three written copies of Guarantee-Warranty.

PART 3 - CONDUIT

3.1 GENERAL

A. Work Included

1. Conduit
2. Fittings

3.2 PRODUCTS

A. Conduit

1. Rigid Galvanized Steel Conduit: Allied, Wheatland, Republic or equal.
2. Flexible Steel Conduit (Greenfield): Triangle, Anaconda, International Metal Hose or equal.
3. Liquidtight flexible metallic conduit (Sealtite): Triangle, Anaconda, International Metal Hose or equal.
4. Rigid Non-Metallic (PVC) Conduit: Carlon, Schedule 80, heavy wall or equal.

B. Conduit Fittings

1. Galvanized Rigid Steel Couplings and Connectors: Raco, Thomas & Betts or equal.
2. Bushings: Raco, Thomas & Betts or equal.
3. Malleable Iron Straps and Hangers: Crouse Hinds, Appleton, Steel City or approved equal.
4. Group Pipe Supports: Unistrut, Kindorf or equal.
5. Expansion Fittings: O.Z. Type AX, Crouse-Hinds or equal.
6. Exposed Conduit Fittings: Crouse-Hinds, Efcor, condulets or equal.
7. Liquidtight flexible metallic conduit fittings: Raco, Thomas & Betts or equal.

3.3 EXECUTION

A. Conduit

In general, conduit installation shall follow layout shown on Plans. However, this layout is diagrammatic only and where changes are necessary due to structural conditions, other apparatus or other causes, such changes shall be made without cost to Owner. Offsets in conduits are not indicated and must be furnished as required.

Use rigid galvanized steel conduit throughout except as noted herein.

Use only rigid galvanized conduit for exposed turn-ups.

Use PVC Schedule 80 when run underground. Use only rigid galvanized when exposed. Use rigid galvanized steel or PVC Schedule 80 when run under ground floor concrete slabs and rigid galvanized steel in concrete slabs.

When PVC conduit is used, turn up with rigid galvanized elbows and provide equipment grounding conductor in accordance with NEC Article 250. **Where PVC conduit is used outside of building line, install in minimum three (3) inch concrete encasement.**

Use rigid galvanized steel factory elbows for bends in plastic conduit runs longer than 100 feet, or in plastic conduit runs, which have more than two bends regardless of length.

Coat metallic conduit placed in fill below concrete or underground with two heavy coats of asphaltum. Recoat any damage to asphaltum coating prior to backfilling.

Support conduit and secure to forms when cast in concrete so that conduit will not be displaced during pouring of concrete. Stuff boxes and cork fittings to prevent entrance of water during concrete pouring and at other times during construction, prior to completion of conduit installation.

Route exposed conduit at right angles or parallel to walls of building.

Use proper sized tools for bending. Do not heat conduit. Dents and flat spots will be rejected. Cut and thread conduit so ends will butt in couplings. Make threads no longer than necessary and ream pipe free of burrs.

Minimum conduit size 3/4" unless otherwise shown on the drawings or required by system.

Leave one #10 or equivalent nylon pull wire in empty conduits.

Use short pieces, approximately 2' of liquid-tight flexible conduit to connect motors and other devices subject to motion and vibration. Use liquidtight flexible conduit where subject to water spray and installed outdoors.

B. Conduit Fittings

Support conduit vertically and horizontally by straps or hangers. Do not exceed these intervals as described in NEC Section 344.30 for rigid metal conduit and in NEC Section 352.30 for PVC.

Use expansion fittings, properly bonded to assure ground continuity, across expansion joints in floors and ceilings. Use hubs at conduit entrance into all pullboxes, junction boxes, devices in exposed areas where knockout installations occur.

When connections are made to motors or other equipment, not near walls or columns, provide vertical conduit, minimum 3/4", attached to floor with floor flange bring wiring out of conduit by means of conulet and flexible conduit extending to equipment junction box.

PART 4 - WIRE AND CABLE

4.1 GENERAL

A. Work Included

Wire and Cable

4.2 PRODUCTS

A. Materials

Wire and cable shall be 600 volt by Anaconda, General Cable, Habirshaw, Okonite, Rome, Triangle, Southwire or equal unless otherwise noted on Plans.

For line voltage control wiring, use #14 type THHN/THWN copper by one of the manufacturers listed above. For low voltage control wiring, use type wiring recommended by equipment manufacturer.

Use stranded copper type THHN/THWN for branch circuit wiring #10 and smaller. No conductor for branch circuit wiring shall be smaller than #12.

Use stranded copper, type THHN/THWN for feeder and power circuits #8 and larger.

Fixture wire shall be in accordance with Article 402 of the National Electrical Code.

Provide color coded wire and with a different color for each phase and neutral and ground as follows: 120/240 volts circuits-phases A, B and C: black, orange and blue respectively; neutral: white; ground: green; Approved color tape is acceptable for feeders. Also provide color coded wire for control circuits.

Use Scotchlok or Ideal wire connectors for #14 through #18 conductors. Use Burndy or equivalent by T&B, compression connectors with crimpit cover, type CC, for #6-600 MCM conductors.

Where branch circuits homeruns exceed 70' in length for 120 volt and 150' in length for 240 volt, No. 10 wire shall be used to first outlet.

4.3 EXECUTION

A. Installation

Complete conduit system before pulling any wire or cable. Only approved cable lubricants (such as soaptone) shall be used as necessary.

Conductors shall be continuous from outlet to outlet or to branch circuit overcurrent devices. Make splices only in junction boxes. Splices shall not be made in panelboards. Sufficient slack shall be left at terminations to make proper connections.

Connect No. 10 wire and smaller with Type R, 3M Scotchlock, Ideal 400 Series, or equal tapeless connectors or equal.

Connect No. 8 wire and larger with Lock-Tite type silicon bronze type connectors, T&B Series 35000 or 54000, or equal. Insulate connections of No. 8 wire and larger with 3M #33 or Scotch 33+ tape.

PART 5 – PANELBOARDS

5.1 GENERAL

A. Work Included

Provide all materials, labor and equipment required to furnish and install a complete electrical system as indicated on Plans and as specified herein.

5.2 PRODUCTS

A. Panelboards

277/480 volt, 3 phase, 4 wire or 120/240 volt, 1 phase, 3 wire as indicated on Plans: Cutler Hammer, Square D or approved equal.

Panelboards shall be factory assembled, dead front type with copper bus, lugs, finish trim and thermal-magnetic molded case circuit breakers of frame and trip ratings shown on the Plans.

Provide single door with spring latch lock. Key panel locks alike.

Circuit breakers shall be HACR rated as required.

277/480 volt AC, 3 phase, 4 wire S/N, Branch Circuit Panelboards shall be Eaton-Cutler Hammer type POW-R-LINE, Square D Company or approved equal equipped with bolt on thermal-magnetic circuit breakers. Breakers shall be 1, 2 or 3 pole with integral crossbar to assure simultaneous opening of all poles in multipole circuit breakers. Bolt on circuit breakers shall be able to be installed in the same panelboard without requiring additional hardware. Circuit breakers shall be rated 277/480 volts AC (single pole 15-50 ampere) or 480 volt AC (2 and 3 pole, 15-50 amperes) with continuous current ratings as noted on the plans. Interrupting rating shall be coordinated with power company's available fault current. Single pole 15 and 20 ampere circuit breakers shall carry the SWD marking and H.I.D. rated. Each panelboard shall be equipped with a bare uninsulated equipment grounding bar for use in terminating separate equipment grounding conductors. Panelboards shall be equipped with full or 200 percent neutral bars as scheduled.

120/240 volt AC, 1 phase, 3 wire S/N, Branch Circuit Panelboards shall be Eaton-Cutler Hammer type POW-R-LINE, Square D Company or approved equal equipped with bolt on thermal-magnetic circuit breakers. Breakers shall be 1 or 2 pole with integral crossbar to assure simultaneous opening of all poles in multipole circuit breakers. Bolt on circuit breakers shall be able to be installed in the same panelboard without requiring additional hardware. Circuit breakers shall be rated 120/240 volts AC (single pole 15-50 ampere) or 240 volt AC (2 pole, 15-50 amperes) with continuous current ratings as noted on the plans. Interrupting rating shall be coordinated with power company's available fault current. Single pole 15 and 20 ampere circuit breakers shall carry the SWD marking and H.I.D. rated. Each panelboard shall be equipped with a bare uninsulated equipment grounding bar for use in terminating separate equipment grounding conductors. Panelboards shall be equipped with full or 200 percent neutral bars as scheduled.

B. Panelboards

Provide typewritten directory cards listing location of circuit controlled. Insert with plastic cover into directory frame on door.

Provide arc flash marking for all automatic transfer switches, panelboards and control panels per NEC Article 110.16.

Provide identification indicating voltage, phase, device designation, source fed from and other required marking per NEC Article 110.21.

PART 6 - DISTRIBUTION SYSTEM AND GROUNDING

6.1 GENERAL

A. Work Included

1. Service system
2. Distribution system
3. Grounding

6.2 PRODUCTS

A. Materials

Furnish conduit and cable and miscellaneous hardware required.

6.3 EXECUTION

A. Service and Distribution System

At the Proposed Pump Station, system secondary will commence at power company transformer pole with service entrance riser installed underground through service entrance rated automatic transfer switch, feeder conduit and wire from proposed diesel engine generator system to automatic transfer switch and continue with feeder circuit to panelboard, feeder circuits, mini power center and branch circuits to wiring devices and other utilization equipment.

B. Grounding

Ground electrical system in accordance with Article 250, National Electrical Code local authorities having jurisdiction, and as indicated on the Plans.

Do not use flexible metal conduit and fittings as a grounding means. Pull a green wire in each piece of flexible and conduit and screw to conduit system with lugs at both ends.

Install green bonding jumpers in flush mounted receptacle ground terminal. Install green

bonding jumpers between outlet box and wall bracket mounted lighting fixtures. Screw jumpers to fixture chassis with lugs.

Install code size green grounding conductors in all branch circuits feeding receptacles, motors or other permanently wired fixed equipment and all feeder circuits. Bond conductors to chassis of fixed equipment. All grounding conductors shall be bonded to multi-terminal ground bus at panelboard. Grouping of grounding conductors under a single lug is not acceptable.

END OF SECTION 26 05 00

SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL PROVISIONS

1.1 GENERAL

A. Work Included

1. Work included under this section shall consist of furnishing of all labor, materials, tools, equipment and supplies required to provide grounding as required by the National Electrical Code and as indicated by the plans and specifications.
2. Types of grounding specified in this section include the following:
 - a. System and enclosure grounding for electrical distribution systems.
 - b. Grounding for separately derived electrical systems.
 - c. Enclosures grounding.
 - d. Equipment grounding.
 - e. Perimeter fence grounding.
3. Requirements of this section apply to electrical grounding work specified elsewhere in these specifications.
4. Comply with NEC requirements as applicable to materials and installation of electrical grounding systems, associated equipment, and wiring. Provide grounding products which are UL listed and labeled.
5. Comply with applicable requirements of UL Standards No. 467 and No. 869 pertaining to electrical grounding and bonding.
6. Comply with applicable requirements of IEEE 837 for all grounding materials installed outside of the building in earth.
7. Provide all grounding for the electrical system in accordance with requirements of all local codes and the 2008 edition of the National Electrical Code.

B. Grounding Electrode System

1. Metal underground water pipe.
2. Electrical service entrance.
3. Metal frame of the building.
4. Building concrete reinforcing steel.

5. Rod electrodes.
- C. Performance Requirements
1. Grounding System Resistance: 5 ohms.

PART 2 - PRODUCTS

2.1 GROUNDING SYSTEMS

- A. Work Included
1. Except as otherwise indicated, provide electrical grounding systems indicated with assembly of materials including, but not limited to: cables/wires, connectors, terminals, (compression type lugs), grounding rods, bonding jumper braid, and additional accessories needed for complete installation. Where materials or components are not indicated, provide products complying with NEC, UL, and IEEE Standard 837 for applications indicated.
 2. Unless otherwise indicated, provide copper electrical grounding conductors for grounding connections matching power supply wiring materials and sized according to NEC.
 3. Copper braided tape, constructed of 30 gauge bare copper wire and properly sized for indicated applications.
 4. Ground Rods: Steel copper exterior, 5/8" dia. x 8' or 3/4" dia. X 10' as specified.
 5. Exothermic connections: Cadweld or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Work Included
1. Coordinate with other electrical work, as necessary, to interface installation of electrical grounding system with other work.
 2. Install electrical grounding systems where shown, in accordance with applicable portions of NEC, with NECA "Standard of Installation", and in accordance with recognized industry practices to ensure that products comply with requirements and serve intended functions.
 3. Furnish and install system, enclosure and equipment grounding for all electric wiring for the pump station in full compliance with the requirements of the NEC. All grounding conductors shall be copper.

4. Ground conductors to underground rods and to building structural steel.
5. Each dry type transformer installation shall have system and enclosure grounding in accordance with the requirements of Article 250.26 of NEC. A bonding jumper, sized in accordance with Article 250.79 (c) of the NEC, shall be used to connect the neutral and enclosure of the secondary side of the transformer at the XO terminal. A separate grounding conductor shall then be provided from this connection to the building structural steel and bonded to the steel by means of thermit welding, or by an approved grounding clamp.
6. Where short lengths of flexible conduit are used to supply motors, the conduit and connectors shall be of a type approved by UL as a bonded grounding enclosure or, in lieu thereof, a separate bonding conductor and approved ground clamps shall be provided to assure a continuous ground return path around the flexible conduit and its associated connectors.
7. At all metal conduit terminations at panelboards, junction boxes, transformers, or other enclosures, the conduit shall be properly bonded to the enclosure or ground bus, as required by codes.
8. The service equipment, conduit system, supports, cabinets, other equipment and neutral conductor shall be grounded in accordance with Article 250 of the National Electrical Code, and Local Utility District requirements.
9. All ground connections shall have clean contact surfaces and shall be made with approved fittings. Where flexible metal conduit is used a separate conductor shall be provided, securely grounded on each side of the flexible section.
10. All feeder and branch circuits shall have insulated green grounding conductor sized per Article 250 of NEC.
11. Bond building water piping system per NEC if piping is metallic.
12. Field Welding: Comply with AWS Code for procedures, appearance, quality of welds, and methods used in correcting welding work. Provide welded connections where grounding conductors connect to underground grounding rods and to building steel; Cadweld, or approved equal.
13. All metal, non-current carrying parts of the electrical system shall be grounded in accordance with the latest specifications of the National Electrical Code and further in accordance with the requirements as shown on the drawings.
14. The Electrical Contractor shall perform or have performed by a testing laboratory a test on the ground systems. Testing shall be done in accordance with the IEEE Green Book Test Procedures. Provide copies of test results to the Owner and Designer.

END OF SECTION 26 05 26

SECTION 26 32 13 - STANDBY ENGINE GENERATOR SYSTEMS

PART 1 - GENERAL PROVISIONS

1.1. GENERAL

A. Scope

Under this Section of Specifications, Contractor shall furnish and install generator systems designed for outdoor installation.

1. Diesel engine driven electric generating set to provide standby power.
2. Automatic load transfer control to provide automatic starting and stopping.
3. Mounted accessories as specified.

B. Rating

The standby generator system shall be diesel engine with KW rating as shown on plans. Generator system outputs shall be voltage, phase and frequency shown on plans.

Power plant shall be standard product of Caterpillar, Cummins, Kohler or approved equal conforming to these Specifications and rated not less than specified. Generator set shall be factory assembled.

C. Submittals

Shop plans for standby power plant shall contain not less than the information listed as follows:

1. **Certification that power plant furnished will serve electrical loads indicated including motor starting loads with type of starting indicated.**
2. Continuous and standby rating of plant including voltage and phase.
3. Frequency and voltage regulation with maximum instantaneous voltage dip and time of recovery to stable operation.
4. Output voltage adjustment range in percentage of rated plant voltage.
5. Alternator type and method of connection to prime mover.
6. Components contained in alternator instrument panel.
7. Rating of engine at operating speed, engine cycle and number of cylinders.
8. Type of engine lubrication system and verification of components.
9. Type of engine governor.

10. Fuel consumption at rated load.
11. Verification that all accessories specified is to be provided. This includes fuel tank with capacity indicated, cold weather starting aid with rating and voltage indicated, exhaust system with muffler type indicated, outdoor housing with verification of space available within housing for batteries and day tank.
12. Starting batteries including ampere hour rating.

D. Regulatory Requirements

Conform to latest edition of NEC and applicable inspection authority.

Generator manufactured to NEMA standards.

PART 2 - PRODUCTS

2.1 ENGINE

Engine shall be diesel-fueled and cubic inch displacement as shown on plans, water cooled with unit mounted 122 degrees Fahrenheit radiator, fan and water pump. At 1800 RPM, engine shall develop not less than horsepower indicated on schedule on drawings.

Full pressure lubrication shall be provided by lube oil pump. Engine shall have an air cleaner and oil filter with replaceable elements, a lube oil cooler, fuel filters and carburetor replaceable air cleaner and automatic choke.

Engine speed shall be governed by electronic governor to maintain alternator frequency within 0.25 Hertz from no load to full load alternator output. Engine shall have a 24 volt D.C. battery charging alternator and voltage regulator. Remote starting shall be 24 volt electric starter.

Power plant shall contain engine start-stop controls and cranking limiter to cycle engine starting circuit for 15 second intervals with 5 seconds between starts and shall open engine starting circuit in 90 seconds if engine is not started within that time. Engine control panel shall contain solid state engine monitor with individual fault pilot lamps and shut down for overcrank, over speed, high engine temperature and low oil pressure per NFPA 110.

2.2 ALTERNATOR

Alternator shall be 125 degrees C. rise four pole revolving field design, three phase with temperature compensated solid state voltage regulator and brushless rectifier exciter system.

Stator shall be directly connected to engine flywheel housing. Rotor shall be driven through a semi-flexible driving flange. Alternator insulation shall be Class F.

Frequency regulation shall not exceed 0.25 Hz. Voltage regulation shall be within plus or minus 0.5% of rated voltage. Following application of full load via transfer switch to generator set, RMS voltage determined on symmetrical basis for each complete cycle starting at first zero crossing after load application through 6th cycle must not drop below 65% of RMS voltage prior to application of load. RMS voltage starting at seventh cycle from first zero crossing after load

application shall be sustained at no less than 90% of RMS voltage before load application. This voltage must be maintainable for a period of at least 30 seconds without tripping overcurrent devices in generator or causing overheating of any component beyond its design limits. Recovery to stable operation shall be within two seconds. Rheostat shall be provided to allow adjustment of rated voltage through +5%.

2.3 ENGINE-GENERATOR SET CONTROL

The generator set shall be provided with a microprocessor-based control system, which is designed to provide starting, monitoring, and control functions for the generator set. The control system shall also be designed to allow local monitoring and control of the generator set, and remote monitoring and control as described in this specification. The control shall be mounted at the location shown on the project drawings for medium voltage applications, and on the generator set for 600 volt and lower applications. When mounted on the generator set the control shall be vibration isolated and prototype tested to verify the durability of all components in the system under the vibration conditions encountered. **The control shall be mounted at a maximum height of 5 feet 6 inches above concrete pad or access platform/walkway for operator viewing per NFPA 110.** The control shall be UL508 labeled, CSA282-M1989 certified, and meets IEC8528 part 4. All switches, lamps, and meters shall be oil-tight and dust-tight, and the enclosure door shall be gasketed. There shall be no exposed points in the control (with the door open) that operate in excess of 50 volts. The controls shall meet or exceed the requirements of Mil-Std 461C part 9, and IEC Std 801.2, 801.3, and 801.5 for susceptibility, conducted, and radiated electromagnetic emissions. The entire control shall be tested and meet the requirements of IEEE587 for voltage surge resistance. The generator set mounted control shall include the following features and functions:

- A. Three position control switch labeled RUN/OFF/AUTO.

In the RUN position the generator set shall automatically start, and accelerate to rated speed and voltage. In the OFF position the generator set shall immediately stop, bypassing all time delays. In the AUTO position the generator set shall be ready to accept a signal from a remote device to start and accelerate to rated speed and voltage.

- B. Red "mushroom-head" push-button EMERGENCY STOP switch.

Depressing the emergency stop switch shall cause the generator set to immediately shut down, and be locked out from automatic restarting.

- C. Push-button RESET switch.

The RESET switch shall be used to clear a fault and allow restarting the generator set after it has shut down for any fault condition.

- D. Push-button PANEL LAMP switch.

Depressing the panel lamp switch shall cause the entire panel to be lighted with DC control power. The panel lamps shall automatically be switched off 10 minutes after the switch is depressed, or after the switch is depressed a second time.

E. Generator Set Metering:

The generator set shall be provided with a metering set with the following features and functions:

2.5 inch, 90 degree scale analog voltmeter, ammeter, frequency meter, and kilowatt (kW) meters. These meters shall be provided with a phase select switch and an indicating lamp for upper and lower scale on the meters. Ammeter and kW meter scales shall be color coded in the following fashion: readings from 0-90% of generator set standby rating: green; readings from 90-100% of standby rating: amber; readings in excess of 100%: red.

Digital metering set, 0.5% accuracy, RMS type, to indicate generator voltage, frequency, output current, output kW, KW-hours, and power factor. Generator output voltage shall be available in line-to-line and line-to-neutral voltages, and shall display all three phase voltages (line to neutral or line to line) simultaneously.

F. Generator Set Alarm and Status Indication:

The generator set shall be provided with alarm and status indicating lamps to indicate non-automatic generator status, and existing alarm and shutdown conditions. The lamps shall be high-intensity LED type. The lamp condition shall be clearly apparent under bright room lighting conditions. The generator set control shall indicate the existence of the following alarm and shutdown conditions on a digital display panel:

- low oil pressure (alarm)
- low oil pressure (shutdown)
- oil pressure sender failure (alarm)
- low engine temperature (alarm)
- high engine temperature (alarm)
- high engine temperature (shutdown)
- engine temperature sender failure (alarm)
- low coolant level (alarm or shutdown-selectable)
- fail to crank (shutdown)
- overcrank (shutdown)
- overspeed (shutdown)
- low DC voltage (alarm)
- high DC voltage (alarm)
- weak battery (alarm)
- low fuel-daytank (alarm)
- high AC voltage (shutdown)
- low AC voltage (shutdown)
- under frequency (shutdown)
- over current (warning)
- over current (shutdown)
- short circuit (shutdown)
- ground fault (alarm)(optional-when required by code or specified)
- over load (alarm)
- under frequency (alarm)

In addition, provisions shall be made for indication of two customer-specified alarm or

shutdown conditions. The non-automatic indicating lamp shall be red, and shall flash to indicate that the generator set is not able to automatically respond to a command to start from a remote location.

G. Engine Status Information:

The following information shall be available from a digital status panel on the generator set control:

- engine oil pressure (psi or kPA)
- engine coolant temperature (degrees F or C; Both left and right bank temperature shall be indicated on V-block engines.)
- engine oil temperature (degrees F or C)
- engine speed (rpm)
- number of hours of operation (hours)
- number of start attempts
- battery voltage (DC volts)

H. Control Functions

The control system provided shall include a cycle cranking system, which allows for user selected crank time, rest time, and # of cycles. Initial settings shall be for 3 cranking periods of 5 seconds each, with 15 second rest period between cranking periods.

The control system shall include an idle mode control, which allows the engine to run in idle mode in the RUN position only. In this mode, the alternator excitation system shall be disabled.

The control system shall include an engine governor control, which functions to provide steady state frequency regulation as noted elsewhere in this specification. The governor control shall include adjustments for gain, damping, and a ramping function to control engine speed and limit exhaust smoke while the unit is starting. The governor control shall be suitable for use in paralleling applications without component changes.

The control system shall include time delay start (adjustable 0-300 seconds) and time delay stop (adjustable 0-600 seconds) functions.

The control system shall include sender failure monitoring logic, which is capable of discriminating between failed sender or wiring components and an actual failure conditions.

I. Alternator Control Functions:

The generator set shall include an automatic voltage regulator. The voltage regulator shall be immune from misoperation due to load-induced voltage waveform distortion. The voltage regulator shall be equipped with three-phase RMS sensing. The regulator shall control buildup of AC generator voltage to provide a linear rise and limit overshoot. The regulator shall include a torque-matching characteristic, which shall reduce output voltage in proportion to frequency below a threshold of [58-59] HZ. The voltage regulator shall include adjustments for gain, damping, and frequency roll-off. The

regulator shall include provisions reactive load sharing and electronic voltage matching for paralleling applications. Motorized voltage adjust pot is not acceptable for voltage matching.

Controls shall be provided to monitor the output current of the generator set and initiate an alarm when load current exceeds 110% of the rated current of the generator set on any phase for more than 5 seconds. The controls shall shut down and lock out the generator set when output current level approaches the thermal damage point of the alternator.

Controls shall be provided to monitor the kW load on the generator set, and initiate an alarm condition when total load on the generator set exceeds the generator set rating for in excess of 5 seconds.

Controls shall include a load shed control, to operate a set of dry contacts (for use in shedding customer load devices) when the generator set is overloaded.

An AC over/under voltage monitoring system shall be provided which initiates shutdown of the generator set when alternator output voltage exceeds 110% of the operator-set voltage level for more than 10 seconds, or instantaneously when voltage exceeds 130%. Under voltage shall be indicated when the output voltage of the alternator is less than 85% for more than 10 seconds.

A battery monitoring system shall be provided which initiates alarms when the DC control and starting voltage is less than 25 VDC or more than 32 VDC. During engine starting, the low voltage limit shall be disabled, and if DC voltage drops to less than 14.4 volts for more than two seconds a "weak battery" alarm shall be initiated.

When required by National Electrical Code or indicated on project drawings, the control system shall include a ground fault monitoring relay. The relay shall be adjustable from 100-1200 amps, and include adjustable time delay of 0-1.0 seconds. The relay shall be for indication only and not trip or shut down the generator set. Note bonding and grounding requirements for the generator set, and provide relay, which will function correctly in system as installed.

J. Control Interfaces for Remote Monitoring:

All control and interconnection points from the generator set to remote components shall be brought to a separate connection box. No field connections shall be made in the control enclosure or in the AC power output enclosure. Provide the following features in the control system:

A Customer Interface Module (CIM) shall be provided to translate alarm, fault, and status conditions to a set of relay contacts. Contacts shall represent conditions of:

- EMCP diagnostic fault system not in automatic alarm
- High coolant temperature alarm
- Low coolant temperature alarm
- Low oil pressure alarm
- Low oil pressure fault

High coolant temperature fault
Overcrank fault
Overspeed fault

Form "C": dry common alarm contact set to indicate existence of any alarm or shutdown condition on the generator set.

A fused 10 amp switched 24VDC power supply circuit shall be provided for customer use. DC power shall be available from this circuit whenever the generator set is running.

The control shall be provided with provisions for connection of remote monitoring equipment as described herein or shown on the drawings.

2.4 MAIN LINE CIRCUIT BREAKER

Type: A main-line, molded case circuit breaker mounted upon and sized to the output of the generator shall be installed as load circuit interrupting and protection device. It shall operate both manually for normal switching functions and automatically during overload and short circuit conditions.

The circuit breaker shall be mounted at a height not exceeding 6 feet 7 inches above the concrete pad or working platform per NEC Article 380.8. This height is to include sub-base fuel tank if applicable. Provide access steps and working platform as required for accessibility.

2.5 COOLANT HEATER WITH INTEGRAL PUMP

Provide 240 volts, A.C., 1 phase heater, thermostatically controlled in engine coolant system as cold weather starting aid.

Electric heater shall be permanently connected to circuit extended from building electrical system.

2.6 ANTIFREEZE

Provide antifreeze to protect coolant to -35 degrees F.

2.7 STARTING BATTERY

Wet cell batteries, lead-acid type shall be provided with stand-by power plant. Batteries shall be selected for starting requirements of stand-by power plant and shall be rack mounted within plant housing. Batteries shall be permanently connected to two step battery charger.

2.8 MUFFLER

Provide residential rated muffler complete with raincap and supports, installed inside weatherproof housing.

2.9 BATTERY CHARGER

Provide a ten (10) amp voltage regulated battery charger for engine starting battery. Charger shall be equipped with float, taper, and equalize charge settings. Charger shall automatically taper amps to zero when battery approaches full charge.

2.10 HOUSING

Stand-by power plant shall be provided in outdoor, weatherproof housing with removable panels for access to equipment. Starting batteries shall be rack mounted within housing.

2.11 ACCESS PLATFORM/WALKWAY

Stand-by power plant shall be provided with an access platform/walkway with required steps, handrails and all accessories required to meet the standards of OSHA 3124 and 1910.24 to allow readily observation of the control panel per NFPA 110. The platform shall provide for operator/maintenance personnel viewing of the engine-generator set control and monitoring panel at a maximum height of 5 feet 6 inches above platform or concrete pad. The platform shall be designed to allow opening and closing of outward swinging doors while standing on the platform. The access platform/walkway shall be equivalent to that manufactured by Tramont KM Walkway, Milwaukee, WI.

2.12 FUEL TANK

Fuel tank for diesel engine generator set shall be a skid base mounted double wall tank with minimum capacity to provide 48 hours operation at full capacity. Tank shall be of type construction shown on schedule on Plans with supply and return lines and fill cap. Fuel tank shall be equipped with a fuel leak detector.

Provide single pole, double throw low level alarm switch that senses the fuel level by pressure changes. When activated, circuit shall sound alarm at remote annunciator. Provide fuel level gauge on skid base mounted tank.

At completion of testing and final acceptance of installation, Contractor shall fill fuel tank to full capacity with No. 2 diesel fuel.

2.13 VENTING AND PIPING

Venting for fuel tank and piping between engine, fuel tank, levelometer, fuel pumps, etc. shall be furnished and installed in accordance with NFPA Standard 37.

PART 3 - EXECUTION

3.1 STAND-BY ELECTRIC POWER SYSTEM

Performance of stand-by power plant shall be certified in writing, with respect to full power rating, voltage and frequency regulation and motor starting capability. Certifications shall be submitted with submittal.

Stand-by power plant shall be provided with spring type, vibration isolators and mounted on a welded steel base. Plant shall be anchored to a concrete base. Anchor bolts shall be galvanized 3/4" in diameter.

Install standby generator in accordance with manufacturer's recommendations.

3.2 TESTING

Prior to acceptance of installation, equipment shall be tested for any defects and be subjected to full load test through the use of portable dry type load banks supplied for this purpose at job site by generator set supplied.

END OF SECTION 26 32 13

SECTION 26 36 00 - AUTOMATIC TRANSFER SWITCH

PART 1 - GENERAL PROVISIONS

1.1 GENERAL

A. Standards

The auto transfer switch equipment shall be listed by UL, Standard 1008.

B. Operation

When the automatic utility to utility control senses interruption of preferred utility source, the automatic transfer switch is signaled to transfer load from preferred source to alternate source. After determining the loss is not momentary, the transfer switch transfers the load to alternate power source. When normal power resumes, the control again delays momentarily, permitting the normal source to stabilize and re-transfer the load to preferred utility source.

PART 2 - PRODUCTS

2.1 AUTOMATIC TRANSFER SWITCH EQUIPMENT

A. The standby power system shall include automatic transfer switch. The transfer switch equipment shall be designed, built, tested, furnished, and warranted by the manufacturer.

B. Ratings: All transfer switches shall be UL listed per Standard 1008, CSA Approved, and rated for total system load (including motor loads, electric discharge lamps, resistive loads, and tungsten lamps loads. Tungsten lamp load not to exceed 30% of continuous current rating). All transfer switches supplied shall be suitable for use on emergency and legally required standby systems in accordance with National Electrical Code and NFPA 99. (3 pole type.)

1. Transfer switch shall be 60 Hertz. Main power switch contacts shall be rated for 600 Volts AC minimum on transfer switch 40 through 3000 amperes.
2. Transfer switch shall be contactor type (NEMA Type A, IEC Type PC) and shall be rated to carry 100% of rated current continuously in the enclosure. Transfer switch using integral circuit breakers which require rating in enclosures do not meet this specification.
3. Transfer switch shall be rated for continuous operating in ambient temperatures of -40 degrees C (-40 degrees F) to + 50 degrees C (+122 degrees F), relative humidity of up to 95% (non-condensing), and altitudes of up to 10,000 feet.
4. Transfer switch shall have minimum withstand and closing ratings (RMS symmetrical amperes) as required for the available fault currents. These ratings shall be obtained without contact welding. These fault current ratings shall be verified by UL witnessed test on representative test samples and shall be the

ratings listed in the UL listing or component recognition procedures for the transfer switch supplied.

5. Where the line side overcurrent protection is provided by molded case circuit breakers at 480 VAC or less, the circuit breakers shall be of the type specified by the manufacturer with the maximum size not exceeding the maximum ratings listed in the UL listing or component recognition procedures for transfer switch supplied.
6. Where the line side overcurrent protection is provided by current limiting fuses, the fuses shall be UL Class RK1, RK5, J or L (with the fuse sizes being no larger than the maximum ratings listed in the UL listing or component recognition procedures for transfer switch supplies), and the transfer switch withstand and closing rating shall be suitable for 200,000 amperes available fault current.
7. Transfer switch shall have a full rated neutral with lugs for normal, standby and load neutral conductors inside cabinet.

2.2 CONSTRUCTION

- A. Transfer switch shall be double-throw construction, positively electrically and mechanically interlocked by a mechanical beam to prevent simultaneous closing (for break before make operation), and mechanically held in both normal and standby positions. Transfer switch using electrical interlocking and make before break closed transition do not meet this specification.
 1. Transfer switch shall not contain any integral overcurrent devices in the main power circuit, including molded case circuit breakers or fuses.
 2. Transfer switch rated through 1000 amperes shall be equipped with permanently attached operating handles and quick-break, quick-make contact mechanisms suitable for manual operation under load.
 3. Manual operating handles and all control switch (other than key operated switch) shall be accessible to authorized personnel only by operating the key locking cabinet door. Transfer switch with manual operating handles and/or non-key operated control switch located on the outside of cabinet do not meet this specification and are not acceptable.
 4. Transfer switch shall be equipped with direct acting linear operators for simple, reliable and fast acting transfer during automatic operation.
 5. Maximum electrical transfer time in either direction shall be six (6) cycles, except where "programmed transition" feature is used.
 6. Switch shall have covers which allow visual determination of main contact position.

7. Main switch contacts shall be high-pressure silver alloy contacts to resist burning and pitting for long-life operation. All switches shall have arc chutes of heat absorbing material and metal leaves for positive extinguishing of arcs. Arc chutes shall have insulating covers to prevent interphase flashover.
8. Transfer switch shall have one Form C, 10 Amp 250 Volt AC auxiliary switch on both normal and emergency sides, operated by the transfer switch. These switches shall be factory wired to an easy access terminal block and shall be used to monitor transfer switch position for controlling indicator lights or other peripheral equipment.
9. Complete AL-CU lugs listed and CSA approved, shall be provided for normal, emergency, and load positions. For 150 ampere and larger switch, top and bottom feed for load connections shall be provided for slim design requiring less wall space. Load connections shall be designed for field relocation, either from top to bottom or vice-versa. Wiring bending space at normal, emergency, load and neutral lugs inside the switch cabinets shall comply with NEC Article 312.
10. Unless noted, or specified otherwise, each transfer switch shall be mounted in separate UL listed NEMA 3R cabinet with key-locking front door.
11. Provide auxiliary relays with 2 normally open and 2 normally closed contacts rated at six amps at 600 VAC to provide remote indication of source status, set status, load status or other function as indicated on the drawings. Provide additional auxiliary relays as required to provide proper functioning of system.

2.3 AUTOMATIC CONTROLS

- A. Control shall be mounted inside of main lockable cabinet door to allow for ease of service access. Control disconnect plugs shall be provided to de-energize control circuits to avoid shock hazards while making control adjustments. The solid state voltage sensors and time delay modules shall be plug-in circuit boards with gold contacts for ease of service. The control shall be designed for a high level of immunity to power line surges and transients and tested to IEEE Standard 587. The control shall have optically isolated logic inputs, high isolation transformers for AC inputs, and relays on all outputs.
 1. Solid state undervoltage sensors shall simultaneously monitor all phases of normal source and all phases (all 3 phases for 3 phase system) of the emergency source to provide adjustable range sensors for field adjustment for specific application needs. Pick-up setting shall be adjustable from minimum of 85% to maximum of 98% of nominal voltage. Dropout settings shall be adjustable from minimum of 75% to maximum of 98% of pick-up setting with fixed dropout time delay of 0.5 seconds. Voltage sensors shall be temperature compensated over the temperature range of -25 degrees F. (-32 degrees C). Voltage sensors shall allow for adjustment to sense partial loss of voltage on any phase of normal or emergency source, even where motor feedback voltages exist.

2. Solid state adjustable overvoltage sensors shall be provided to simultaneously monitor all phases of the normal and emergency sources. Sensors shall be adjustable for pickup settings from a minimum of 100% to a maximum of 130% ($\pm 5\%$) with a dropout of 5% ($\pm 1\%$) of nominal voltage above pickup setting. Provide adjustable time delay of 0.5 to 2.2 minutes.
3. Provide solid state over and under frequency sensor to monitor the normal emergency power sources. Sensor shall be adjustable for pickup minimum of $\pm 4\%$ to maximum to $\pm 20\%$ of nominal frequency. Dropout shall be $\pm 5\%$ of nominal wider than frequency bandwidth. Time delay shall be adjustable from 0.1 to 15 seconds.
4. Controls shall signal the engine-generator set to start upon signal from normal source voltage sensors. Solid state time delay start, adjustable from 0 to 5 seconds (factory set at 2 seconds) shall avoid nuisance start-ups on monetary voltage dips for momentary interruptions.
5. Switch shall transfer the load to the emergency power system after the generator set reaches proper voltage and frequency. Solid state time delay transfer, adjustable from 0 to 120 seconds (factory set a 2 seconds) shall allow for the engine-generator set to stabilize before application of load.
6. The transfer switch shall control the generator set to allow generator set to start and transfer load within 10 seconds after the normal source power failure. It shall be the responsibility of the supplier of the emergency power system that this requirement is met.
7. Switch shall retransfer the load to the normal source after normal power restoration. Solid state time delay retransfer, adjustable from 0 to 30 minutes (factory set at 15 minutes), shall allow normal power to stabilize before retransfer and shall allow staggered retransfer of load to multiple switch systems.
8. Controls shall signal the engine-generator set to stop after load retransfer to normal source. Solid state time delay stop, adjustable from 0 to 10 minutes (factory set at 5 minutes) shall maintain availability of emergency source in the event that normal source fails shortly after retransfer and shall permit engine to run unloaded for cool down before shutdown.
9. The operating power for transfer and retransfer shall be obtained from the source to which the load is being transferred. Controls shall provide an automatic retransfer of the load from emergency source to normal source if emergency source fails when normal source is available.
10. Start contacts for the engine control shall be gold type, dry contracts wired to easy access terminal block and compatible with the generator set control equipment furnished.

2.4 FRONT PANEL DEVICES

- A. Provide devices mounted on front of main cabinet door consisting of switch position indicator lamps (white NORMAL and amber STANDBY), normal source available (green), standby source available (red), and a key operated selector switch to provide the following positions and functions:
 - 1. TEST – Simulated normal power loss to control unit for testing of generator set, including transfer of load. Controls shall provide for a system test without load transfer. Controls shall include provisions to automatically return the system to the normal power source if the generator set fails during any test or exercise period.
 - 2. NORMAL – This is normal operating position and it restores the load to the normal source after test and after time delays.
 - 3. RETRANSFER – Momentary position to override retransfer time delay and cause immediate return to normal source after test or actual outage.
- B. Provide a digital AC Voltmeter and a Frequency meter.

2.5 ACCESSORY ITEM

Provide solid state exerciser clock to set the day, time and duration of generator set test period. Provide with or without load selector switch for the exercise function.

Contacts for these functions are to be form C type, rated for 120 VAC or 30 VDC at 4 amps.

2.6 APPROVED MANUFACTURERS

- A. Caterpillar, Cutler Hammer ATC, ASCO or approved equal.

PART 3 - EXECUTION

3.1. AUTOMATIC TRANSFER SWITCH EQUIPMENT

- A. Install transfer switch equipment per manufacturer's recommendations.
- B. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems".
- C. Set field-adjustable intervals and delays, relays, and engine exerciser clock.

3.2 TESTING

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installation, including connections, and to assist in testing.

- B. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown.
- C. Coordinate tests with tests of generator and run them concurrently.

END OF SECTION 26 36 00

SECTION 26 43 13 - SURGE PROTECTION FOR LOW-VOLTAGE ELECTRICAL POWER CIRCUITS

PART 1 - GENERAL PROVISIONS

1.1 GENERAL

A. Work Included

Competitive products submitting against this specification must provide a single impulse surge current test report issued by a nationally recognized testing facility. The test report should demonstrate that the competitive surge protection device (SPD) can withstand, in its installed configuration, the specified value surge current without failure of any internal component (MOV's, wiring, printed circuit board and disconnect).

PART 2 - PRODUCTS

2.1 SURGE PROTECTION DEVICE

- A. Furnish and install surge protection (SPD) device on the 277/480 volt panelboard at the Proposed Pump Station. Each unit shall be suitable for installation on a three phase 277/480 VAC, four wire plus ground type service. Each surge protection (SPD) device shall be of a passive parallel, thermal stress reducing design with a response time of less than or equal to one nanosecond. Each unit shall be UL 1449 Third Edition and CSA listed, and it shall have a full fifteen (15) year non-limited warranty. Each SPD shall have a peak surge current rating of no less than 100,000 amps per phase (L-N + L-G). The UL 1449 Third Edition let through voltage, line-to-neutral, shall not exceed 1,000 volts peak when the unit hit with an ANSI/IEEE 62.41 Category B (6,000 volt, 4,000 amp) impulse hit.

Surge protection device shall be equal to Current Technology Model No. TG3-100-480-3Y-PNB or approved equal.

PART 3 - EXECUTION

Not used

END OF SECTION 26 43 13

SECTION 33 01 48 - TEMPORARY BYPASS PUMPING SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section includes all materials, labor, and equipment required to provide bypass flow control for manhole and sanitary sewer lines construction, upgrade, or rehabilitation.
- B. Furnish all power, maintenance, etc. to implement the bypass flow control and diversion pumping to divert the existing flow around the work area for the work's duration.
- C. The design, installation, and operation for the temporary bypass pumping system shall be solely the Contractor's responsibility.

1.2 PERFORMANCE AND PENALTIES

- A. The Contractor shall ensure:
 - 1. All temporary sewer bypass pumping activities for the work are completed in full compliance with the local, state and federal requirements, and no water quality or quantity compliance issues are encountered.
 - 2. No illicit pollutant discharges to (or to a location that would create contaminated water runoff to) a storm sewer, a stormwater conveyance, or a water body shall occur.
 - 3. All temporary sewer bypass pumping activities for the work are completed in full compliance with state and U.S. EPA regulations, and no water quality or quantity compliance issues are encountered.
- B. No discharge of sewage or debris shall be released to the environment. Should the Contractor's actions cause a sewage or debris overflow or bypass to the environment, site cleanup will be the Contractor's responsibility consistent with regulatory requirements. All overflow or bypass environmental cleanup activities shall be immediately commenced and prosecuted continuously by the Contractor. Any associated fines or penalties enacted by local or state regulatory agencies, the U.S. EPA, and/or any other regulatory groups or programs will be borne solely by the Contractor.

1.3 QUALITY ASSURANCE

- A. Follow national standards and as specified herein.
- B. Perform leakage and pressure tests on discharge piping using clean water, before operation. Notify Engineer 24 hours prior to testing.
- C. Maintain and inspect temporary pumping system every two hours. Responsible operator: on site when pumps are operating.
- D. Keep and maintain spare parts for pumps and piping on site, as required.

- E. Maintain adequate hoisting equipment and accessories on site for each pump.

1.4 SUBMITTALS

- A. Submit at least 4 weeks prior to commencing work, including plugging any line, bypass pumping, or similar actions.
 - 1. Detailed plan and description of proposed pumping system. Indicate number, size, material, location and method of installation of suction and discharge piping, size of pipeline or conveyance system to be bypassed, staging area for pumps, site access point, and expected flow.

1.5 CONTRACTORS RESPONSIBILITY FOR OVERFLOWS AND SPILLS

- A. Schedule and perform work in manner that does not cause or contribute to incidence of overflows, releases or spills of sewage from sanitary sewer system or bypass operation.

1.6 DELIVERY AND STORAGE

- A. Transport, deliver, handle, and store pipe, fittings, pumps, ancillary equipment and materials to prevent damage and following manufacturer's recommendations.
 - 1. Inspect all material and equipment for proper operation before initiating work.
- B. Material found to be defective or damaged due to manufacturer or shipment.
 - 1. When Engineer deems repairable: Repair as recommended by manufacturer.
 - 2. When Engineer deems not repairable: Replace as directed by Engineer before initiating work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Discharge and Suction Pipes: Approved by Engineer.
 - 1. Discharge piping: Determined according to flow calculations and system operating calculations.
 - 2. Suction piping: Determined according to pump size, flow calculations, and manhole depth following manufacturer's specifications and recommendations.
- B. Polyethylene Plastic Pipe:
 - 1. High density solid wall and following ASTM F714 Polyethylene (PE) Plastic Pipe (SDR-DR) based on Outside Diameter, ASTM D1248 and ASTM D3550, with a minimum pressure rating of 2.5 times the total dynamic pump head.

2. Homogenous throughout, free of visible cracks, discoloration, pitting, varying wall thickness, holes, foreign material, blisters, or other deleterious faults.
3. Defective areas of pipe: Cut out and joint fused as stated herein.
4. Assembled and joined at site using couplings, flanges or butt-fusion method to provide leak proof joint. Follow manufacturer's instructions and ASTM D 2657.
 - a. Threaded or solvent joints and connections are not permitted.
 - b. Fusing: By personnel certified as fusion technicians by manufacturer of HDPE pipe and/or fusing equipment.
 - c. Butt-fused joint: True alignment and uniform roll-back beads resulting from use of proper temperature and pressure.
 - d. Allow adequate cooling time before removal of pressure.
 - e. Fused joints shall be watertight and have tensile strength equal to that of pipe.
5. Use in streams, storm water culverts and environmentally sensitive areas.

C. Flexible Hoses and Associated Couplings and Connectors.

1. Abrasion resistant.
2. Suitable for intended service.
3. Rated for external and internal loads anticipated, including test pressure.
 - a. External loading design: Incorporate anticipated traffic loadings, including traffic impact loading.
 - b. When subject to traffic loading, compose system, such as traffic ramps or covers.
 - c. Install system and maintain H-20 loading requirements while in use.

D. Valves and Fittings: Determined according to flow calculations, pump sizes previously determined, and system operating pressures.

E. Plugs: Selected and installed according to size of line to be plugged, pipe and manhole configurations, and based on specific site.

1. Additional plugs: Available in the event a plug fails. Plugs will be inspected before use for defects which may lead to failure.

F. Aluminum "irrigation type" piping or glued PVC piping will not be permitted.

G. Discharge hose will only be allowed in short sections when approved by Engineer. Hoses shall have no leaks, and all couplings shall be quick connecting with gaskets.

2.2 EQUIPMENT

- A. All equipment used for bypass pumping shall be specifically designed for intended purpose. All piping, pumps, etc. in contact with sanitary sewage shall be manufactured with materials designed for use in a sewage environment.
- B. All pumps used shall be fully automatic self-priming units which do not require foot valves or vacuum pumps in the priming system.

- C. The pumps shall be electric, hydraulic, or diesel powered. Gasoline powered pumps may be used for bypass pumping of short segments for a limited duration (10 hours or less).
- D. All pumps used shall be constructed to allow dry running for long time periods to accommodate cyclical nature of wastewater flows.
- E. Above-ground pumps and/or power units shall be located inside a temporary portable berm to contain any fuel or sewage that may spill during the normal course of operation.
- F. The multiple pump header system shall have check valves to facilitate pump removal, service, and/or replacement while the system remains operational.
- G. All above ground pumps and/or power units shall be equipped with sound attenuation measures which reduce noise levels to 75-decibels maximum at a 30-foot distance from the equipment during all operation periods. If equipment is operated between 8:00 PM and 6:00 AM, this equipment shall also be provided with a sound attenuation 3-sided enclosure including a roof constructed of 2 x 4 lumber frame with 1/2-inch plywood sheathing and 2inch extruded polystyrene foam panels attached to the inside of the entire enclosure. The enclosure shall be portable to allow the enclosure to be moved when bypass pumping equipment is moved.
- H. The discharge location (the point where the bypass main reenters the gravity sewer system) shall be constructed with adequate sealant materials to minimize sewer gas and odor release to the maximum extent possible.

2.3 DESIGN REQUIREMENTS

- A. Provide bypass sewage pumping, as required, around the section in which work is to be performed. Bypass pumping shall be the Contractor's full responsibility. The bypass system shall be a sufficient capacity to handle 2.0 times the peak flow, as provided by Owner for trunk lines, of the pipeline section being bypassed. Bypass pumping systems shall be designed to operate 24 hours per day.
- B. Provide pipeline plugs and pumps of adequate size to handle peak flow, and temporary discharge piping to ensure total flow of main can be safely diverted around section to be repaired.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

- A. At least 4 weeks prior to the desired start date of construction requiring bypass pumping, submit a detailed description of the method proposed for bypass pumping to the Engineer for review and approval. The description shall include all materials and equipment to be used, personnel, spare equipment, and sketches showing proposed pump-around setups. No work shall commence until the Engineer approves.
- B. Bypass pumping equipment shall include pumps, conduits, engines, and related equipment necessary to divert sewage flow around the section in which work is to be performed. Backup

pumps shall be online and isolated from the primary system by valves. Include 100% mechanical redundancy installed online with a float or ultrasonic type system to switch to the standby system automatically if the primary system fails.

- C. Piping redundancy may be required for relatively long bypass piping lengths or large diameter bypass pipes as deemed necessary by the Engineer. Special design considerations shall be made for pump suction lifts greater than 23 feet.
- D. Make all arrangements for bypass pumping when the main is shut down for any reason. The system shall overcome any existing force main pressure on discharge.
- E. Suction and discharge points shall only be located at manholes.
- F. If at any time the Contractor is unable to properly bypass pump the sewage, construction will be stopped until the Contractor can continue work in an acceptable manner. Additional contract time for delays caused by improper equipment, labor, or breakdowns will not be considered.
- G. Service shall be maintained at all times. Surcharges due to plugging the sewer line for bypass pumping shall be maintained to prevent service backups and overflows at any point in the system.
- H. For rehabilitation projects, hose may be used for short runs with the Engineer's approval. If the anticipated bypass time exceeds 48-hours, use hard piping only. If using hose and the bypass time reaches 48-hours, the Contractor may either install hard piping to accomplish the bypass or restore flow until an approved bypass method can be employed. No modifications to the bypass system shall be made without Owner's approval.
- I. The bypass or diversion pumping system shall be able to pump all the sewage in the existing line under all weather and seasonal conditions. All pumping equipment to be used shall be submitted to the Engineer for review and approval.
- J. Bypass pumping systems are required to be operated and continuously monitored 24-hours per day for flow diversion.
- K. For mains being lined, the bypass pumping must be done one manhole upstream and continue for one manhole downstream of the line being rehabilitated in order to use flow through plugs at the insertion and end points. The liner bag may not be used as part of the bypass pumping system or as a plug in the line.
- L. For bypass or diversion pumping in overnight operations greater than 2 days, provide and maintain portable lighting systems as needed for monitoring and operation activities at the bypass pumping site(s).
- M. The temporary diversion pumping system shall be placed in operation prior to the commencement of work in the areas being bypassed. Minimum times of operation prior to the commencement of work are 1 hour for small diameter CIPP lining and 4 hours for any other major system work such as trunk sewer diversion, large diameter sewer lining, or pumping station work.
- N. Protect the bypass lines from damage in the areas of backhoe and excavation operations.

- O. Provide the necessary stop/start controls and a visual alarm indicating a pump malfunction for each pump. Each pump shall have a 0-30 inch Hg vacuum gauge on the inlet and a 0-60 psi pressure gauge on the outlet.

3.2 PREPARATION

- A. Determining location of bypass pipelines.
 - 1. Minimal disturbance to existing utilities.
 - 2. Field locate existing utilities in proposed bypass area.
- B. Obtain approvals for placement within public or private property.
- C. Obtain Engineer's approval of location.

3.3 PERFORMANCE REQUIREMENTS

- A. It is essential for operating the existing system being bypassed that no interruptions in the flow occur throughout the project's duration. Provide, maintain, and operate all temporary facilities such as dams, plugs, pumping equipment (primary and backup units as required), conduits, all necessary power, and all other labor and equipment necessary to intercept the incoming flow before it reaches the point where it would interfere with the work, carry it past the work area, and return it to the existing system downstream of the work.
- B. The temporary pumping system's design, installation, and operation shall be the Contractor's responsibility. The bypass system shall meet all codes and requirements for regulatory agencies having jurisdiction.
- C. Provide all necessary means to safely convey the sewage past the work area. The Contractor will not be permitted to stop or impede the sewer main flows under any circumstances.
- D. No flow diversion around the work area shall be performed in a manner that will cause damage to or surcharging of the existing system. The diversion shall protect public and private property from damage and flooding.
- E. Protect water resources, wetlands, and other natural resources.

3.4 INSTALLATION AND REMOVAL

- A. Remove manhole sections or make connections to existing sewer and construct temporary bypass pumping structures at access location indicated on Drawings and as required to provide adequate suction conduit.
- B. Plugging or blocking of sewage flows shall incorporate a primary and secondary plugging device. When plugging or blocking is no longer needed for performance and acceptance of work, remove in a manner that permits the sewage flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.

- C. When working inside manhole or force main, exercise caution. Follow OSHA, Local, State and Federal requirements. Take required measures to protect workforce against sewer gases and/or combustible or oxygen-deficient atmosphere.
- D. Installation of Bypass Pipelines:
 - 1. Bypass pipeline installation is prohibited in all wetland areas.
 - 2. Pipeline may be placed along shoulder of roads. If in easements, the bypass pipeline shall be within the easement area acquired for the project.
 - a. Do not place in streets or sidewalks.
 - 3. When bypass pipeline crosses local streets and private driveways, place in roadway ramps.
 - a. When roadway ramps cannot be used, place bypass in trenches and cover with temporary pavement as approved by Engineer.
- E. During bypass pumping operation, protect sewer lines from damage inflicted by equipment.
- F. Upon completion of bypass pumping operations, and after the receipt of written permission from Engineer, remove piping, restore property to pre-construction condition and restore pavement.

3.5 FIELD QUALITY CONTROL AND MAINTENANCE

- A. Testing: Prior to actual operation, test the bypass pumping discharge hard piping system for leaks and pressure using clean water. Bypass hard piping shall be hydrostatically tested following each setup and prior to flow diversion or bypass to a minimum pressure 2.5 times the pump(s) total dynamic head. The Engineer shall be given a 24-hour notice prior to testing.
- B. Inspection: Inspect the bypass pumping system on a continuous basis to ensure the system is working properly. A daily checklist for physically inspecting the piping shall be required. The checklist shall contain all bypass pumping system components and shall be specifically developed to address aspects for the individual project. The daily checklist shall be submitted to and approved by the Engineer. The completed daily checklists will be maintained, available for review, and on-site for the project's duration.
- C. Maintenance Service: Ensure the temporary bypass pumping system is properly maintained and that a responsible operator shall be readily available at all times when pumps are operating.
- D. Monitoring
 - 1. During bypass pumping, continuously monitor all bypass pumping system components.
 - 2. A telemetry system or designated personnel to maintain 24-hour onsite monitoring shall be required to alert the Contractor to system malfunctions or high liquid levels in manholes.
 - 3. If bypass pumping activities are conducted near state waters or in other situations where a potential exists for a sewage release to potentially enter state waters by other than direct means, an in-line stream monitoring system shall be used to measure real-time

conductivity and dissolved oxygen (DO) concentrations in 30-minute intervals at a minimum. The system shall be mounted in the receiving stream in the immediate downstream area(s) adjacent to the location(s) of the bypass piping system discharge to the gravity conveyance system. The system shall have web-portal capabilities with alarm functions for conductivity and DO. The alarm function shall be equipped with battery power and solar charging provisions and shall be able to send email and text messaging alarms to at least five devices.

E. Additional Materials

1. Spare parts for pumps and piping shall be kept on site as required.
2. Adequate hoisting equipment for each pump and accessories shall be maintained on site.
3. Keep an HDPE fusion machine on site for the duration of bypass pumping to facilitate immediate repairs to hard piping.

END OF SECTION 33 01 48

SECTION 33 05 23 – BORING AND CASING FOR UTILITY LINES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. The work to be performed hereunder shall consist of the installation of a casing pipe for the purpose of installing a line as shown on the Drawings or as called for in these specifications. It shall include the excavation of a boring pit, auger boring between the points specified on the Drawings, furnishing and installing of the carrier pipe, and disposing of the excavated materials in the manner herein provided.

PART 2 - PRODUCTS

2.1 CASING PIPE

- A. The casing pipe shall be of steel meeting the latest approved American Railway Engineering Association "Specifications for Pipelines for Carrying Flammable and Nonflammable Substances." The steel casing pipe shall have a minimum yield strength of 35,000 psi and shall have the minimum wall thickness shown in the following table:

TABLE OF MINIMUM WALL THICKNESS FOR STEEL CASING PIPE FOR E72 LOADING

<u>CARRIER PIPE</u>	<u>CASING PIPE</u>	<u>NOMINAL THICKNESS</u>
4	8	0.250"
6	12	0.250"
8	16	0.312"
10	20	0.312"
12	22	0.312"
14	24	0.344"
16	26	0.375"
18	28	0.406"

2.2 CARRIER PIPE

- A. The carrier pipe shall be ductile iron pipe meeting the standards in the specifications.

2.3 CASING SPACERS

- A. The casing spacers shall be constructed of circular stainless steel bands, which bolt together forming a shell around the carrier pipe. The casing spacer shall be lined with a ribbed EPDM extrusion with a retaining section that overlaps the edges of the shell and prevents slippage. The spacer shall be designed with risers and runners to support the carrier pipe within the casing and maintain a minimum clearance of 1.0 in. between the casing ID and the carrier pipe OD.

- B. The runners shall be Glass Filled Polymer with ends of the runners beveled to facilitate installation over rough weld beads or the weld ends of misaligned or deformed casing pipe. The runners shall be attached to support structures (risers) at appropriate positions to properly support the carrier pipe within the casing and to ease installation. They shall have a minimum length of 8.0 in. and a minimum width of 2.0 in.
- C. The shell shall be manufactured of 14-gauge T-304 stainless steel. The riser shall be constructed of 10-gauge T-304 stainless steel, with a height to be determined based on the annular space between the carrier pipe OD and the casing ID.
- D. Unless otherwise shown, spacers shall be placed 1-2 feet on either side of the bell joint and one every 6-8 feet apart thereafter for a total of three casing spacers per joint of pipe.

2.4. CASING END SEALS

- A. End seals shall be pull-on or wrap-around seals.
- B. The Wrap-Around or Pull-On end seal shall be manufactured of 1/8" thick neoprene rubber. Provide minimum 2" wide T-304 stainless steel banding with 100% non-magnetic worm gear mechanism.

PART 3 - EXECUTION

3.1 BORING

- A. The boring shall be accomplished by means of augering to the size, line, and grade shown on the Drawings.
- B. The boring by directional drilling is an acceptable means for the casing pipe installation.
- C. Installation of Casing Pipe
 - 1. Jack the steel casing pipe into place as the boring proceeds. Weld sections of casing pipe together to provide watertight joints.
 - 2. Do not remove unacceptable casing without prior approval from the A/E. If the removal of casing pipe is permitted, make proper provisions to prevent caving in of the earth surrounding the casing.
- D. Installation of Carrier Pipe: The carrier pipe shall be furnished by the Contractor. Upon acceptance of the casing, install the carrier pipe in the casing by jacking it through the casing.
- E. Sand Backfill for Annular Space in Jacked Casing: For gravity sewers, the Contractor shall provide sand backfill for the annular space after the sewer is placed at the appropriate grade and elevations. The Contractor shall furnish the necessary sand, equipment, hoses, valves, and fittings for the operation. Sand shall be conveyed by air through a hose and deposited by air pressure in its final position. The sand shall be free of lumps to flow unimpeded and to completely fill all voids. In general, sand backfill will be considered completed when no more sand can be forced into the annular space. The Contractor shall protect and preserve the interior surfaces of the steel casing from damage.

- F. Layout of Work: The Contractor will provide the detailed layout required to keep the tunnel or bore on grade.
- G. Guarantee of Work
 - 1. Guarantee a usable completed casing between the points specified and to the line and grade specified. The allowable tolerance at the downstream end point of the bore shall be such that the invert of the carrier pipe may be positioned within a vertical area limited on the top by an elevation no higher than the elevation shown on the Drawings and on the bottom by an elevation no lower than the existing inlet pipe invert.
 - 2. The allowable tolerance at the upstream end point of the bore shall be such that the invert of the carrier pipe may be positioned at the elevation shown on the Drawings.
 - 3. Each end of the casing pipes shall be plugged with casing end seals.

3.2 TUNNELING ALTERNATIVE

A. General

- 1. In the event boring and jacking is impossible because of pipe size, rock, or other factors and the highway department will not permit open cutting, make crossings by tunneling using liner plates. Conduct tunneling operations as approved by the highway department. If voids are caused by the tunneling operations, fill by pressure grouting or by other approved methods that will provide proper support.

B. Galvanized Plates

- 1. After the plates are formed to shape, the plates shall be galvanized on both sides by the hot dip process. A coating of prime western spelter, or equal, shall be applied at the rate of not less than 2 ounces per square foot of double exposed surface. If the average spelter coating as determined from the required samples is less than the amount specified above, or if any one specimen shows a deficiency of 0.2 ounce, the lot shall be rejected. Spelter coating shall be of first class commercial quality free from injurious defects such as blisters, flux, and uncoated spots..
- 2. The outside of the plates shall be given a bituminous coating meeting the AASHO M-190 specifications for bituminous protected corrugated metal pipe.

C. Design and Construction

- 1. Construct the tunnel by the tunnel method, and completely line on the inside with structural steel liner plates meeting all requirements specified hereinafter. The dimensions of the tunnel shall be as shown on the Drawings.
- 2. The tunneling operation is to commence from a pit that is a minimum of 12 feet long and 4 feet wider than the diameter of the tunnel, bottom to grade, and sheeted and shored, if necessary. Furnish line and grade stakes.
- 3. All excavation for the entire length of the tunnel shall be done by tunneling, and the work may be done from either or both ends of the conduit. Trim the periphery of the tunnel smooth to fit the outside of the steel liner plate as nearly as is practical, and fill all space outside of the steel liner plate with a sand cement grout mixture.
- 4. Install the steel liner plates immediately after the excavated material has been removed. Do not remove material more than 24 inches ahead of the installed liner plates.

5. Provide all necessary bracing, bulkheads, and/or shields to ensure complete safety to all traffic at all times during the progress of the work, and perform the work in such a manner as to not interfere with normal traffic over the work.
6. The steel lining shall consist of plates 16 inches wide, and each circumferential ring shall be composed of the number and length plates necessary to complete the required diameter.
7. The inside diameter of the completed ring shall be as shown on the Drawings, and no part of the plate or reinforcing ribs will be allowed to extend inside this net diameter.
8. The strength of the tunnel lining will be determined by its section modulus. In no case shall it be less than 0.0590 inch cubed per inch of plate width based on the average for one ring of plates. Thickness of the metal for these steel plates shall be not less than 10 gauge, ASTM A569 allowing for standard mill tolerances. The tunnel strength shall be equal to AASHTO railroad E80 loading at the depth of cover obtaining.
9. All plates shall be punched for bolting on both longitudinal and circumferential seams and shall be fabricated so as to permit complete erection from the inside of the tunnel. The longitudinal seam shall be of the flanged or lap type with offset equal to gauge of metal for the full width of the plate, including flanges, and shall have staggered bolt construction fabricated so as to allow the cross section of the plate to be continuous through the seam. Bolts are to be minimum 1/2 inch diameter. All plates shall be of uniform fabrication, and those intended for one size tunnel shall be interchangeable.
10. The material used for the construction of these plates shall be new and unused and suitable for the purpose intended. Workmanship shall be first class in every respect.
11. Install the carrier pipe to the line and grade shown on the Drawings. After the carrier pipe is installed adequately block it, and backfill the space between the carrier pipe and the tunnel liner with 2,000 psi grout. The method of placing this grout shall be approved by the A/E.
12. All tunnels 24 inches and greater in diameter shall have one 2 inch grout coupling no less than 4 feet center to center.

END OF SECTION 33 05 23

SECTION 33 09 30 – INSTRUMENTATION AND CONTROLS FOR SANITARY SEWERAGE UTILITIES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Work Included: Provide RTU for remote cell phone telemetry system for the lift station that will allow remote monitoring of station status and alarms. The control panel shall include all appurtenant equipment and accessories as indicated, specified, and as necessary for a complete, properly operating, and fully functional system.
1. Work includes, but is not necessarily limited to, the following:
 - a. All hardware and control items as indicated and specified herein and required by the Drawings and descriptions, and any additional hardware and software items as necessary for a complete and operating telemetry system.
 - b. All engineering, hardware and software installation and supervision necessary.
 - c. Testing and operational demonstrations as specified.
 - d. Training programs as specified.
 - e. Perform all necessary applications software modifications and additions to the existing SCADA system computer located at the Franklin office to accept and process new alarm and monitoring inputs.
 - f. Prepare Operation and Maintenance Manuals, Record Prints, and Record Applications Software Documentation.
 2. An operations description of the telemetry system is provided later in this section. This description does not cover all instruments, switches, and indicators, but provides a general overview of the required control functions.

1.2 QUALITY ASSURANCE

- A. The control and telemetry system shall be an integrated system and, as such, system integrators shall become familiar with requirements necessary to provide information specified in the system regardless of manufacturer, and be responsible to the Contractor for the complete and satisfactory operation of the entire system.
1. The manufacturer shall supply all devices and appurtenances necessary to provide a complete, operable and satisfactory system as indicated or specified.
 2. System supplier shall have a minimum of 5 years experience in providing similar operational systems of which a listing may be requested.

B. Manufacturer

1. A single system supplier shall furnish, install, test, and commission the entire system. The system supplier shall have the full in-house capabilities and personnel to design, fabricate, program, install, calibrate, and start-up and troubleshoot all control and instrumentation equipment without subcontracting or otherwise involving any temporary or non-staff personnel, except for integration with the system. A qualified electrical contractor may be used to run conduit and pull wire and make all terminations for installations but check-out must be done by the SCADA system supplier.
2. System integrator shall design and furnish a complete, integrated and functionally operating system, warranted to perform the intended functions as herein specified.
3. System integrator shall provide all hardware and software specified herein or required and provide all required and specified collateral services in connection with the system such as testing, calibration, start-up, operation and maintenance manuals, and operator training without additional cost to the Owner.
4. System integrator shall provide integration for control systems by other equipment manufacturers supplying control equipment.
5. System integrator shall be responsible for obtaining all necessary data from individual manufacturers to determine the necessary transition for operation, control, and/or monitoring from the manufacturer's equipment and the Telemetry System.

C. Contractor

1. The lift station Contractor shall be fully and solely responsible for the work of the systems supplier and solely responsible to the Owner for having supplied to the Owner the complete control and telemetry system.
2. To provide personal superintendence and direction to the work, maintaining and supplying complete supervision over and coordination between all subcontractors employed by him.
3. To be responsible for defining the limits of his subcontractor's work, and Contractors of the lift station.
4. To be responsible for setting of instruments (including alarms, etc., as provided under other sections).

D. Technical Services

1. Provide supervisory service of a factory trained service engineer, specifically trained on the type of equipment herein specified, for a period of not less than one 4-hour period during construction to assist the Contractor in the location of sleeves, methods of installing conduit and special cable, mounting, piping, and wiring of one of each type of service, and the methods of protecting all of the equipment prior to placing it into service.
2. Upon completion of equipment installation, provide services of the above service engineer as required for calibration and start-up of the equipment.
3. The minimum period specified above does not relieve the system manufacturer of providing sufficient service to place the system in satisfactory operation.

1.3 SUBMITTALS

A. Product Data:

1. Component manufacturing data sheet indicating pertinent data and identifying each component by item number and nomenclature as indicated on the Drawings and in the Specifications.
2. Component drawing showing dimensions, mounting, and external connection details.
3. System wiring schematics, each on a single Drawing with full description of operation. Component identification on the schematic shall be as indicated above.
4. A system schematic of the hardware with the component manufacturing data sheets for each item, including all system peripherals.
5. A printed copy of each control and monitoring screen and each regulator report form. A complete description of each screen shall accompany the print.

B. Provide operation and maintenance manuals.

1. Operating instructions shall incorporate a functional description of the entire system, including the system schematics which reflect "as-built" modifications.
2. Special maintenance requirements particular to the system shall be clearly defined along with special calibration and test procedures.
3. As part of the operation and maintenance manuals, provide a hard copy listing of the program in the programmable logic controller and a hard copy of all screens.

C. Purchase all software packages required for the system in the name of the City of Franklin, Kentucky. All warranties associated with the hardware and software shall be in the name of the City of Franklin, Kentucky.

D. Provide to A/E for approval any changes, additions, corrections, etc., required to the Bid Documents that are needed to accommodate the system being proposed. The changes, additions, corrections, etc., shall be at the Contractor's expense and shall be included in his bid.

1.4 COORDINATION OF WORK

A. The system vendor shall be responsible for reviewing the Contract Documents that could affect this portion of the work.

B. Plans and specifications have been formulated in an attempt to satisfy the conditions for any system proposed. However, a vendor may find that some changes or additional conduit and wiring from that indicated may be required to accommodate particular equipment being proposed. Should this be the case, the vendor shall include in his bid price, all changes or additional requirements necessary for the system. After award of contract, revised Drawings must be submitted for approval indicating any changes prior to any changes being implemented.

1.5 PRODUCT DELIVERY, HANDLING, AND STORAGE

- A. Schedule the delivery of the equipment to coordinate with the project completion schedule.
 - 1. Each item of equipment to be tagged with identifying number shown on the shop drawings.
- B. Contractor's attention is directed to the fact that equipment has delicate components and extreme care shall be taken in handling to avoid internal and/or external damages.
- C. Damaged equipment will not be accepted.
- D. Equipment not for immediate use shall be stored inside a building, with enclosures under protective coverings and shall be fully protected from moisture, extreme heat, and vibration.

1.6 SPARE PARTS AND TEST EQUIPMENT

- A. System supplier to assist Owner's maintenance personnel in selection of required parts and test equipment.

1.7 WARRANTY

- A. Systems supplier shall furnish a 1-year hardware and software warranty and maintenance contract for the telemetry system, providing for a 24-hour response time 7 days per week for the length of the warranty period. This warranty shall include:
 - 1. Full parts and labor for equipment provided for failure due to manufacturer's defects in materials or workmanship, subject to the integrators and/or manufacturer's inspection and review. Exclusions include normal maintenance, wear and tear, failure caused to misapplication or abuse, or lightning damage.
 - 2. Software support via phone or local site service for control systems applications software including all PLC programming provided.
 - 3. For any service visit due to equipment or software failure during the warranty period, provide the Owner and A/E with a written report stating the reason for equipment failure and recommendations to prevent recurrence.
- B. At the end of this period, the maintenance contract shall be made available for transfer to the Owner.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All equipment and materials shall be new, unused, and proved by previous use of similar products to be completely suitable for the service intended.

- B. All of the equipment shall be the manufacturer's latest and proven design. Specifications and Drawings generally cover features but do not cover all details entering into the design of the control system. The completed system shall be compatible with the functions required and other equipment furnished by the Contractor.
- C. All electrical components of the system shall be powered by 120 volts, single phase, 60 cycle current, except as otherwise indicated or specified.
- D. All contacts for control, remote motor operated, or electrically operated equipment shall be rated not less than 10 amperes at 120 volts AC unless otherwise specified herein.
- E. All systems and individual components shall be protected from voltage and/or current surges which may originate as a result of lightning or other external causes.
 - 1. Protective equipment to be provided by the SCADA System supplier and installed in accordance with his recommendations.
 - 2. Schematics of the instruments submitted for approval to the A/E shall indicate how this protection will be provided and identify the items of equipment which shall be used for this purpose.
- F. System manufacturer to supply "as-built" drawings containing all necessary information for proper maintenance and operation of the system.
 - 1. Wire termination table showing connections (wire terminations) between all furnished components to be supplied to facilitate field wiring.
 - 2. Interconnection information between system components and equipment found in other sections of the specifications shall be complete with all necessary interconnection information.
 - 3. Notes which refer to equipment manufacturer's drawings for proper interconnection will not be acceptable.
 - 4. Provide within 15 days after startup and after any field modifications.
- G. The instrumentation and control system integrator shall make use of readily available products which have a proven history of reliable service when used in municipal water and wastewater applications.
- H. The control system shall be comprised of an High Tide Technologies Model HTT-1100AC/CELL SCADA model or approved equal with communication for a cellular telephone, modem, surge arrestors, relays, power supplies, terminal strips, heater and thermostat, circuit breakers, enclosure, and other appurtenances as required for a fully functioning and fully operational system.
- I. I-O Capacity: Provide 8 digital inputs, four analog (4-20 mA) inputs, and four control relay outputs.

2.2 SOFTWARE DOCUMENTATION

- A. Provide complete documentation for operation and maintenance, covering application software.
- B. Furnish 2 sets of detailed Applications Software Manuals as developed by the Instrumentation and Control System Integrator.

1. Design manuals to permit Owner's personnel to adequately understand the operation of the system as it relates to the process being controlled.
 2. Subdivide manuals into detailed sections describing each of the major software sub-systems provided.
 3. Each sub-section to include an overview or abstract defining in general terms the function of that particular sub-system.
 4. Following the overview include a detailed functional description of the operation of that particular sub-system.
 - a. Include detailed explanation of all operator inputs required.
 - b. Include copies of typical displays involved with the function of the particular sub-system.
 - c. Where applicable, include copies of typical hard copy printouts associated with the sub-system.
 5. Make significant use of step-by-step examples to simplify system use and operation.
- C. All user manuals are to be sturdily bound in hardback binders or in original bindings as furnished by the supplier.

2.3 DRAWINGS

- A. Provide "as-built" drawings containing all necessary information for proper maintenance and system operation.
- B. Interconnection information between system components; and system components and packaged equipment found in other sections of these specifications, shall be complete with all necessary interconnection information.
1. Notes referring to equipment manufacturer's drawings for proper interconnection will not be acceptable.
- C. Systems manufacturers to be responsible for furnishing the Drawings.

2.4 TELEMETRY SYSTEM

- A. General
1. It is the intent of this specification to establish minimum requirements for a web page based cell phone telemetry system designed to provide high reliability for this application.
 2. The internal wiring of the system is to be fixed, with the logic functions it must perform in a given application to be programmed into its memory.
 3. The telemetry system shall be supplied with the CPU, input/output scanner, inputs, outputs, memory, power supply, and all power and interface cables necessary to function as a complete and operable programmable controller system.
- B. Cabinets and Enclosures: Enclosures shall be constructed in accordance with the following requirements:
1. All components shall be housed in a single padlockable enclosure suitable for wall or floor mounting as shown on the Drawings.

2. Telemetry system enclosure shall be constructed to meet or exceed the NEMA 4X rating. Access doors shall have continuous stainless steel hinges and approved latching. Provide internal bracing as required for rigidity. Heat load calculations shall be performed by the instrumentation and control system integrator to ensure that the enclosure is properly sized to allow adequate cooling.
3. Anti-corrosion inhibitor blocks shall be mounted inside each enclosure to reduce corrosion. Corrosion inhibitors shall be Hoffman Model A-HCI10E, or approved equal.

C. Electrical Requirements

1. General: All electrical work shall be in accordance with the applicable requirements of Division 26, Electrical.
2. Wiring: Wiring within panels, consoles, racks and cabinets shall meet the following requirements:
 - a. Wires for AC circuits shall be 300 volt, Type MTW stranded copper and shall be sized for the current to be carried, but not smaller than No. 16 AWG.
 - b. Wires for analog signal circuits shall be 300 volt stranded copper and shall be twisted shielded pairs not smaller than No. 18 AWG.
 - c. Type MTW stranded copper not smaller than No. 18 AWG.
 - d. Wiring shall be numbered and tagged at each termination.
 - e. Wiring for special signals such as communications, digital data and multi-plexed signals shall use manufacturer’s standard cables.
3. Wiring Interface: Wiring entering or leaving each panel, console, rack or cabinet shall be terminated and identified as follows:
 - a. Analog and discrete wiring shall be terminated at numbered terminal blocks.
 - b. Wiring for special signals such as communications, digital data and multiplexed signals may be terminated at manufacturer’s standard connectors.
 - c. All wiring shall be identified in accordance with the requirements of Division 26, Electrical.
4. Provide all PLC equipment suitable for operation 120V, 60 Hz, single phase power.
5. Provide a separate isolated earth ground for each control unit.

2.5 MONITORING

- A. The PLC shall monitor and display the following at the web page:

POINT	NAME	SOURCE	REMARKS
<u>Digital Input</u>			
1	Generator Power	Automatic Transfer Switch	
2	Pump Failure	Pump Control Panel	P1 <u>or</u> P2 Failure initiates alarm
3	P1 Running	Pump Control Panel	When both P1 and P2 are running concurrently, alarm “Lag Pump Running”
4	P2 Running	Pump Control Panel	When both P1 and P2 are running concurrently, alarm “Lag Pump Running”
5	Generator Failure	Generator Control Panel	Low oil pressure <u>or</u> engine overtemp
6	Controller Failure	Pump Controller	
7	High-High Level Alarm	Pump Control Panel	Back-up Floats

8 Spare

Analog Input

1	Wet Well Level	Pump Controller
2	Spare	
3	Spare	
4	Spare	

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until satisfactory conditions are corrected.

3.2 LICENSES

- A. Arrange for and obtain all necessary permits, inspections, and approvals by the proper authorities in the local jurisdiction of the work. This shall include third party inspection and testing of panels and equipment.

3.3 INSTALLATION

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this section.
- B. Install the work of this section in strict accordance with the original design and the manufacturer's recommended installation procedures as approved by the A/E, anchoring all components firmly into position for long life under hard use.
- C. Perform all wiring in compliance with Division 26.
 - 1. Final connections and/or terminations for all 120 volt and higher power wiring indicated on the electrical drawings and in this division of the specifications shall be made by the electrical contractor unless otherwise noted. Final connections and/or terminations for all signal, data and low voltage control wiring indicated on the electrical drawings and in this division of the specifications (shielded cable, fiber optic cable and control wiring) shall be made by the appropriate system or equipment vendor or integrator unless noted otherwise. Equipment supplied under other divisions of the specifications that require electrical connections under this division shall be provided with A/E approved wiring and termination diagrams.

3.4 APPLICATIONS SOFTWARE DEVELOPMENT

- A. Develop and fully document all web page interfaces Application Software.

- B. An Alarm and Event Subsystem shall be developed to allow system operators to view current and historical alarms and events.

3.5 TRAINING

- A. System supplier to provide operation and maintenance training for Owner's personnel to ensure their adequate knowledge of use of the system.

3.6 START-UP SERVICES

- A. Upon final completion of all components determine date of start-up jointly with A/E, Owner, and Contractor.
- B. The Telemetry System Integrator shall be responsible for placing of telemetry, and instrument equipment and systems in operation.
- C. The Telemetry System Integrator shall provide qualified personnel on the job site until successful operation of system is attained.

END OF SECTION 33 09 30

SECTION 33 32 00 – SUCTION LIFT PACKAGED PUMP STATION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. The contractor shall furnish and install one (1) factory-built, automatic pumping station as described herein. The station shall be complete with all needed equipment, factory-installed on a welded steel base with fiberglass cover.
- B. The principal items of equipment shall include four vertical, close-coupled, motor driven, vacuum primed, non-clog pumps; valves; internal piping; central control panel with circuit breakers; motor starters and automatic pumping level controls; heater; ventilating blower; priming pumps with pump prime detection system and appurtenances; and all internal wiring.

1.2 REFERENCES

- A. American Bearings Manufacturers Association (ABMA)
- B. American National Standards Institute (ANSI)
 - 1. ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800.
 - 2. ANSI/ASME B 16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard
 - 3. ANSI/ASME B31.1 - Power Piping.
 - 4. ANSI S 2.19 - Balance Quality of Rigid Bodies
- C. American Water Works Association (AWWA)
 - 1. ANSI/AWWA C207 - Standard for Steel Pipe Flanges for Waterworks Service—Sizes 4 In. through 144 In.
 - 2. AWWA C504 - Rubber-Seated Butterfly Valves
 - 3. AWWA C606 - Groove and Shouldered End Joints
- D. Hydraulic Institute (HI)
 - 1. ANSI/HI 9.6.4 - Centrifugal and Vertical Pumps - Vibration Measurements and Allowable Values
 - 2. Hydraulic Institute Standards for Centrifugal, Rotary, and Reciprocating Pumps.
- E. ASTM International (ASTM)
 - 1. ASTM A36 - Standard Specification for Carbon Structural Steel
 - 2. ASTM A48 - Specification for Gray Iron Castings.
 - 3. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
 - 4. ASTM A536 - Standard Specification for Ductile Iron Castings
 - 5. ASTM B505 - Standard Specification for Copper Alloy Continuous Castings

6. ASTM B584 - Standard Specification for Copper Alloy Sand Castings for General Applications

F. National Electrical Manufacturers Association (NEMA)

1. NEMA MG1 - Motors and Generators

G. National Fire Prevention Agency

1. NFPA70 - National Electric Code

H. NSF International (NSF)

1. NSF 61 – Drinking Water System Components – Health Effects

I. Underwriters Laboratory (UL)

1. UL508 - Electrical Assemblies
2. UL QCZJ - Packaged Pumping Systems

J. ETL Testing Laboratories (ETL)

1. Inspection, Test and Evaluation for Packaged Pump Stations - ETL Category 225

1.3 SUBMITTALS

A. Submittals shall include copies of all materials required to establish compliance with these specifications. At a minimum, they shall include the following:

1. Shop drawings showing important details of construction and dimensions.
2. Descriptive literature, bulletins, and/or catalogs of the equipment.
3. A detailed description of the system operation, including pressure and flow ranges, pump sequencing, and controller functionality.
4. Guaranteed performance curves and data sheets on the pumps showing head, capacity, efficiency, NPSHR, and design and maximum horsepower.
5. Total weight of the equipment.
6. Complete Bill of Materials for the system.
7. Electrical information, including control schematic and panel layout to scale.
8. A complete list of all field service offices, complete with phone numbers and contact information, having the field service office closest to the site clearly indicated

B. Operation and Maintenance Manuals: At a minimum, the manuals shall include:

1. Shop drawings showing important details of construction and dimensions.
2. Descriptive literature, bulletins, and/or catalogs of the equipment.
3. A detailed description of the system operation, including pressure and flow ranges, pump staging, and controller functionality.
4. Guaranteed performance curves and data sheets on the pumps showing head, capacity, efficiency, NPSHR, and design and maximum horsepower.
5. Total weight of the equipment.
6. Complete Bill of Materials for the system.

7. Electrical information, including control schematic and panel layout.
8. Manufacturer's Operation and Maintenance Manuals with parts cross-sections.
9. Recommended spare parts.
10. Contact phone numbers for troubleshooting and service.
11. Field Tests - Test reports in booklet form showing all field tests performed to adjust each component and all field tests performed to prove compliance with the specified performance criteria, upon completion and testing of the installed system. Each test report shall indicate the final position of the controls.

1.4 QUALITY ASSURANCE

- A. Bidding manufacturers shall have the necessary organization, experience, capital, and equipment to carry out the manufacturing and start-up of the equipment. Each bidder shall have produced similar packaged pumping systems for similar applications a minimum of five (5) times over the past five (5) years. The Owner and/or Engineer reserve the right to reject any bid that cannot satisfactorily demonstrate successful experience and competence with similar packaged pumping systems.
- B. The pump station shall be a pre-fabricated assembly. All materials incorporated in the pump station shall be new and of the best quality, meeting the technical requirements for the purpose intended. All components of the pump station shall be given an operational test at the pump station manufacturer's facility to check for excessive vibration, for leaks in the piping or seals and correct operation of the automatic control and vacuum priming systems and all auxiliary equipment. Installed pumps shall take suction from a deep wet well, simulating actual service conditions. The control panel shall undergo both a dry logic test and a full operational test with all systems operating.
- C. The pumps, motors, control equipment, and all appurtenant equipment included under pumps, motors and controls shall be furnished by a single pump systems manufacturer. The manufacturer shall be responsible for all other equipment furnished. All components provided under this section shall be shipped, delivered and received as a single lot from the pump station manufacturer's plant. Separate shipments of components from their individual manufacturer's facility shall not be permitted. The manufacturer shall supply three complete sets of operation instructions and service manuals, bound in a 3-ring binder each with an electronic file(s) on a cd (pdf format) for all materials supplied, and for manufacturer's recommended operations, service and maintenance manuals, and parts listing.

1.5 MANUFACTURER'S SERVICE REPRESENTATIVE

- A. The packaged pumping system manufacturer shall provide factory-direct service personnel for the set, start-up, preventative maintenance and general service of the system.
- B. The Manufacturer shall provide the services of a factory-trained representative for a maximum period of one day on-site to perform initial startup of the pump station and to instruct the owner's operating personnel in the operation and maintenance of the equipment.

1.6 GUARANTEES, WARRANTIES

- A. After completion, the CONTRACTOR shall furnish to the OWNER the manufacturer's written guarantees that the pumping equipment will operate with the published efficiencies, heads, and flow ranges and meet these specifications. The CONTRACTOR shall also furnish the manufacturer's warranties as published in its literature and as specified.
- B. The manufacturer of the station shall warrant the stainless steel baseplate for twenty-five (25) years from date of shipment against structural failure and perforation due to corrosion.
- C. The Contractor shall warranty the pump station for one (1) year after final acceptance of project by the Owner.

PART 2 - PRODUCTS

2.1 PUMP SCHEDULE

- A. The following conditions of service shall be strictly adhered to:

Pump ID	4C2B
Number of Units	2
Type of Drive	Constant
Type of Pump Installation	Series
Design Capacity (US gpm)	300
Design Head (feet)	
Each pump	101
Series installation	202
Minimum Efficiency at Design Point %	30
Minimum Solids Handling Capability (inches)	3
Discharge Size, minimum	4
Suction Size, minimum	4
Static Suction Lift (ft)	20
Site Elevation (ft)	625.50
Maximum Rotational Speed (rpm)	1760
Minimum Drive Horsepower (per pump)	20

2.2 CONSTRUCTION

- A. The station shall be constructed in one complete factory-built assembly. It shall be sized to rest on the top of the wet well as detailed on the drawings. The supporting floor plate shall be minimum 1/2" thick steel with reinforcing, as required, to prevent deflection and ensure an absolutely rigid support.

- B. The pump station shall be enclosed by a two piece hinged fiberglass cover. The cover shall have a suitable drip-lip around the edge and shall be provided with means to allow the pump chamber to be locked with padlocks. The fiberglass cover shall have a minimum of 1" thick urethane insulation, protected by fiberglass, with an "R" value of 7 or more.
- C. Each cover shall be attached with a multi segment stainless steel hinge, constructed of 7 gauge (minimum) Type 304 stainless steel with a 3/8" diameter stainless steel pin and supporting at least 75% of the width of one end. Stainless steel bolts with tamperproof heads and a full width 3/8" thick anodized aluminum backing plate shall anchor the hinge to the fiberglass cover.
- D. Dual high-pressure gas struts shall be provided to counteract the dead weight of the cover assembly and limit the maximum lifting force required for opening to less than 20 pounds. The cover shall be self-latching upon opening, with a manually operated release for closing. Duplex heavy gauge safety chains shall be provided to prevent over-extension. All hardware and components of the cover assembly that are exposed to the weather shall be constructed of corrosion resistant materials.
- E. A 1/4" thick sliding aluminum manway cover located exterior to the fiberglass pump chamber shall be provided, complete with padlocking provisions. The manway shall be an integral part of the station floor plate and provide access to the wet well.
- F. The pump volutes and discharge piping shall be mounted in relation to the floor plate as detailed on the drawings.
- G. Enclosures utilized to house the valve train and/or controls which are defined under OSHA Article 29CFR, Part 1910 as a Confined Space shall not be acceptable.
- H. A stanchion with lifting arm shall be provided to lift each pump. The lifting arm shall have a hook over the center of the motor to support a hoist (Provided by others) for removal of the motors, impellers and pumps from the station.

2.3 CORROSION-RESISTANT STAINLESS STEEL BASEPLATE

- A. The baseplate of the pump station structure shall be fabricated of corrosion-resistant lean duplex series 2100 stainless steel alloy, 316L stainless steel or equal. The stainless steel shall have a Pitting Resistance Equivalent Number (PREN) of 24.0 or greater and general corrosion resistance shall be less than or equal to 0.1 mm per year in 15% H₂SO₄ at 120 degrees F. Due to the corrosion resistance requirements, Grade 304-304L is not acceptable.
- B. The stainless steel surfaces shall be glass bead blast cleaned to remove surface contamination and provide a uniform finish, after which the baseplate shall undergo an electrochemical passivation process to remove any free iron contamination from the stainless steel surface. This process shall also add a transparent oxide film to protect the surface from future contamination.

2.4 WELDING

- A. All steel structural members shall be joined by electric arc welding with welds of adequate section for the joint involved.

2.5 PROTECTION AGAINST CORROSION

- A. All structural steel surfaces shall be factory blasted to remove rust, mill scale, weld slag, etc. All weld spatter and surface roughness shall be removed by grinding. Surface preparation shall comply with SSPC-SP6 specifications. Immediately following cleaning, a single 6-mil dry film thickness of epoxy resin shall be factory applied. This coating shall be formulated for abrasion and corrosion resistance.
- B. Stainless steel, aluminum and other corrosion resistant surfaces shall not be coated. Carbon steel surfaces not otherwise protected shall be coated with a suitable non-hardening rust preventative compound. Auxiliary components, such as the electrical enclosure, ventilating blower and vacuum pumps, shall be furnished with the original manufacturer's coating.
- C. Finish coating shall be accomplished prior to shipment of the station from the factory and shall comply fully with the intent of these specifications. A touch-up kit shall be provided by the pump station manufacturer for repair of any marks or scratches occurring during shipping and installation. This kit shall contain detailed instructions for use and shall be the same material as the original coating.

2.6 MAIN PUMPS

- A. The pumps shall be vertical, centrifugal non-clog type of heavy cast-iron construction, especially designed for the use of mechanical seals and vacuum priming. In order to minimize seal wear caused by linear movement of the shaft, the shaft bearing nearest the pump impeller shall be locked in place so that end play is limited to the clearance within the bearing. To minimize seal wear resulting from shaft deflection caused by the radial thrust of the pump, the shaft from the top of the impeller to the lower bearing supporting the impeller shall have a minimum diameter of 1-7/8" for motor frame sizes 213 through 286; 2-1/8" for motor frame sizes 324 and 326; and 3" for frame 364 and larger. The dimension from the lowest bearing to the top of the impeller shall not exceed 6".
- B. The bearing nearest the impeller shall be designed for the combined thrust and radial load. The upper bearing shall be free to move in a linear direction with the thermal expansion of the shaft and shall carry only radial loads.
- C. The shaft shall be solid stainless steel through the mechanical seal to eliminate corrosion and abrasive rust particles. Removable shaft sleeves will not be acceptable if the shaft under the sleeve does not meet the specified minimum diameter.
- D. Each pump shall have an adapter providing a large water reservoir above the impeller to provide for positive exclusion of air from the impeller. The seal shall be inside this area to assure lubrication.
- E. Each pump shall be constructed so as to permit priming from the lower pressure area behind the impeller. Priming from high-pressure connections will not be acceptable. The priming bowl shall be transparent, enabling the operator to monitor the priming level.
- F. Each pump shall be arranged so that the rotating element can easily be removed from the casing without disconnecting the electrical wiring or disassembling the motor, impeller, backhead or seal, so that any foreign object may be removed from the pump or suction line.

- G. The pump shaft shall be sealed against leakage by a single mechanical seal constructed so as to be automatically drained and primed each time the pump is drained and primed. Water which lubricates the mechanical seal shall be automatically drained from around the seal if the pump loses prime in order to allow both the pump and the seal to be drained, thereby preventing freezing and breakage of the seal during power outages in sub-freezing temperatures.
- H. The seal shall be of carbon and ceramic materials with the mating surfaces lapped to a flatness tolerance of one light band. The rotating ceramic shall be held in mating position with the stationary carbon by a stainless steel spring. The entire seal assembly shall be held in place by a bronze seal housing.
- I. The pump volute shall be furnished with mounting lugs and bolted to the station floor plate, forming a gas-tight seal.

2.7 IMPELLER

- A. The pump impeller shall be of the enclosed two-port type made of close-grained cast-iron and shall be balanced. The eye of the impeller as well as the ports shall be large enough to permit the passage of a sphere 3" in diameter. The impeller shall be keyed with a stainless steel key and secured to the motor shaft by a stainless steel capscrew equipped with a Nylock or other suitable self-locking device. The impeller shall not be screwed or pinned to the motor pump shaft and shall be readily removable without the use of special tools. To prevent the buildup of stringy materials, grit and other foreign particles around the pump shaft, all impellers less than full diameter shall be trimmed inside the impeller shrouds. The shrouds shall remain full diameter so that close minimum clearance from shrouds to volute is maintained. Both the end of the shaft and the bore of the impeller shall be tapered to permit easy removal of the impeller from the shaft.

2.8 MOTORS

- A. The pump motors shall be vertical, solid shaft, NEMA P-base, squirrel-cage induction-type, corrosive duty design, and suitable for 3 phase, 60 cycle, 460 volt electric current. They shall have Class F insulation, suitable for temperatures up to 105°C. The insulation temperature shall, however, be maintained below 80°C. The motors shall have normal starting torque and low-starting current, as specified by NEMA Design B characteristics. They shall be Premium Efficiency rated and shall comply with Federal energy standards. Leads shall be terminated in a gasketed, over-sized cast iron connection box and shall be clearly identified. Motor casing shall be cast iron.
- B. The motors shall have 1.15 service factor. The service factor shall be reserved for the owner's protection. The motors shall not be overloaded beyond the nameplate rating, at the design conditions or at any point on the operating curve of the impeller.
- C. The motor-pump shaft shall be centered, in relation to the motor base, within .005". The shaft runout shall not exceed .003".
- D. The motor shaft shall equal or exceed the diameter specified under "main pump", at all points from immediately below the top bearing to the top of the impeller hub.

- E. A bearing cap shall be provided to hold the bottom motor bearing in a fixed position. Bearing housings shall be provided with fittings for lubrication as well as purging old lubricant.
- F. The motor shall be fitted with heavy lifting eyes or lugs, each capable of supporting the entire weight of the pump and motor.

2.9 CONTROLS

- A. The control equipment shall be mounted in a NEMA Type 3R steel enclosure. The circuit breakers and control switches shall be operable without opening the hinged access cover.
- B. A grounding-type convenience outlet shall be provided on the side of the cabinet for operation of 115-Volt AC devices.
- C. Thermal magnetic air circuit breakers shall be provided for branch disconnect service and short circuit protection of all motor control and auxiliary circuits.
- D. NEMA Starters - NEMA rated magnetic across-the-line starters with overload protection for each phase shall be provided for each pump motor to give positive protection against phase unbalance, thermal overload, phase loss and ground fault. Each single-phase auxiliary motor shall be equipped with an over-current protection device in addition to the branch circuit breaker, or shall be impedance protected. All switches shall be labeled and a coded wiring diagram shall be provided.
- E. A time delay relay shall be provided to cause the second stage pump of each set to start and come up to speed before the first set is started. This is to prevent starting a pump with pressure on the seal.
- F. Pump Running Lights - A green panel light to indicate "Pump On" shall be provided for each main pump.
- G. 120V Alarm Light - A vapor-proof light fixture with 50-watt lamp for outdoor pole mounting shall be provided with a red globe and guard.
- H. 120V Alarm Horn - A vibratone-type horn mounted on a weather-tight box suitable for pole mounting shall be provided.
- I. Panel Mounted Automatic Reset Alarm Silence Switch - A momentary contact alarm silencing switch mounted on the control panel shall be provided. The alarm shall automatically be reset when the alarm condition is removed.
- J. Remote Alarm Contacts - In addition to the common, powered local alarm connection, individual unpowered contacts shall be provided and wired to a terminal strip for field connection to a remote alarm monitoring system (not included).
- K. Surge Protective Device - A surge protective device for lightning and surge protection with an internal automatic discharge circuit and rated for three phase service shall be provided.
- L. Time Delay - The pump control system shall provide for a time delay to prevent simultaneously starting the pump motors after power failure.

- M. Main Circuit Breaker - A main circuit breaker shall be installed in the control panel to provide over-current protection for the station, and shall be capable of being used to disconnect the three-phase power to the pump station. The breaker shall be operable without opening the panel, and shall be interlocked with the panel door. It shall be capable of being padlocked in the "Off" position
- N. Phase Monitor - A relay with double pole, double throw contacts shall be provided to monitor and protect against phase loss (single-phasing), under voltage (brownouts) and phase reversal (improper sequence). It shall automatically reset when three-phase service returns to normal.
- O. Pressure Transducer Level Control System
 - 1. The liquid level in the wet well shall be monitored by a submersible hydrostatic pressure transducer with stainless steel sensor diaphragm, providing a 4-20 mA signal to the pump control unit. The body of the transducer shall be made of 316 stainless steel. The pressure transducer shall have a permanent hermetically sealed connection to a polyethylene insulated cable, which shall support the transducer 6" from the bottom of the wet well, and shall pass through a cord grip seal in the station base. The pressure transducer unit shall be rated for wastewater or potable water service, and for operation in explosion hazardous areas.
 - 2. Three (3) displacement switches shall be provided to automatically operate the pump in back-up mode, in case of failure of the digital control system or the submersible level transducer. The back-up system shall be entirely independent of the digital system. A 30' color-coded cord shall be provided with each switch. The cord shall have a corrosion-resistant vinyl jacket and be multi-stranded in order to prevent fatigue. The displacement switch cords and the cable for the submersible pressure transducer shall enter the wet well through cord grip seals.
 - 3. To control the operation of the pumps with variations of liquid level in the wet well, and the high and low water alarm functions, a specially preprogrammed, dedicated microprocessor-based control system shall be provided. The controller shall interface with the wet well level transducer, integral panel display unit, motor starters, and alarm functions as required.
 - a. The digital controls shall operate on 24 volts or less, to eliminate shock hazard. The 24-volt power supply shall be overload protected to be "crowbar safe" and will return to operation when a short is removed.
 - b. To reduce exposure to corrosive environments and ensure the control system's reliable, long-term operation, the controller shall have a sealed, user-friendly, graphical interface. The interface shall be comprised of a rotary knob, switches and five (5) columns of ultra-bright, daylight-viewable red LED's. Four (4) 40-segment, 4" columns of LED's shall show the wet well level, the pump on and off control bands, and the high and low alarm setpoint bands. All LED's within a control band shall be illuminated when operating under normal power. A fifth LED column shall indicate the controller's configuration, status and active alarms. Alarms shall consist of high alarm, low alarm and input signal out of range. Monitor functions shall include control power and normal system operation. Discrete LED's shall show the activation of the differential pump control stages.

- c. The controller shall provide easy, convenient indication and adjustment of the operating setpoints and controller configuration without the need for tools. For ease of operation and configuration, multiple indicating columns are required. Controllers that provide fewer columns; thus, limiting the viewing of relevant and necessary station information, are specifically precluded by this specification.
- d. The pump control circuits shall be forced OFF by power loss. Upon power restoration, the controller shall enable the pumps in an adjustable time-step sequence as required to meet the demand.
- e. The controller shall continuously indicate the status of the selected alternation sequence and control modes. The controller shall provide 1st On/1st Off, Fixed and Auto Rotate alternation sequences
- f. Integral span, offset, and damping adjustments shall be easily adjustable. The controller shall have a configurable security lockout feature.
- g. The controller shall contain a level simulation function that allows manual manipulation of the displayed process variable. While simulating, the controller shall display both the actual wet well level and the simulated level.
- h. The controller shall contain an RS-232 communication port and have capabilities for connection to a SCADA (Supervisory Control and Data Acquisition) system using Modbus® protocol. The complete assembly shall be designed for use in UL508 Industrial Control Panels.

P. Elapsed Time Meter

- 1. A running time meter shall be supplied for each pump to show the number of hours of operation. The meter shall be enclosed in a dust and moisture-proof molded plastic case. The flush-mounted dial shall register in hours and tenths of hours up to 99,999.9 hours before repeating. The meter shall be suitable for operation from a 115-volt, 60-cycle supply.
- 2. A third running time meter shall be supplied to show the number of hours of operation with both pump sets running in parallel. The meter shall be enclosed in a dust and moisture-proof molded plastic case. The flush mounted dial shall register in hours and tenths of hours up to 99,999.9 hours before repeating. The meter shall be suitable for operation from a 115-volt, 60-cycle supply.

Q. Pump Failure To Prime Or Failure To Pump Alarm: To sense failure to deliver normal flow for any reason, including failure to prime, each pump shall be provided with a sealed sensor switch mounted in a protective ABS enclosure. The enclosure shall be mounted with an adjustable universal mounting bracket to the external arm of each discharge check valve. The mounting bracket shall allow the adjustment of the sensor switch with a single locking pivot adjustment. A red LED indicating light shall be provided on each switch unit to facilitate accurate setting of the switch for proper operation. The sensor switch shall monitor the movement of the check valve arm and thereby detect failure of the pump to deliver normal operating flow when called on to run. An auxiliary time delay relay shall be provided to prevent an alarm signal during the pump priming and startup period.

2.10 VACUUM-PRIMING SYSTEM

- A. A vacuum priming system shall be furnished to prime the main pumps. The system shall be as shown on the vacuum priming schematic and shall include two (2) vacuum pumps, providing 100 percent standby. Vacuum pumps shall have corrosion-resistant internal components. The vacuum priming system shall be complete with large port vacuum control solenoid valves, prime level sensor, float-operated check valves to protect the vacuum pumps, and all necessary shut-off valves as shown on the piping schematic. The float-operated check valves shall have a transparent body for visual inspection. All hoses and tubing used in the priming system shall be at least 3/8" nominal diameter.
- B. The solenoid valves used in the vacuum priming system shall be of the high flow, direct acting stainless steel body type, with threaded ports, NBR seals and 300 Series stainless steel plunger, rod, plate and springs. The minimum orifice diameter shall be 5/16". The solenoid valves shall be UL Listed, with Class F coil rating and of suitable voltage and thermal capacity for the application.
- C. Liquid level in the pump priming chamber shall be monitored by a resonant frequency liquid level probe. The probe shall be equipped with a piezoelectric drive and sensitive circuits to detect frequency shifts when the probe is covered by liquid. The probe shall be completely sealed and have a 316L stainless steel housing for corrosion resistance. It shall be provided with a wiring connector molded of PolyPhenylSulfone, an amorphous high performance thermoplastic for impact and chemical resistance. The probe shall have a plug-in connector to facilitate easy removal.
- D. The probe shall be provided with light emitting diodes. This diagnostic tool shall indicate connectivity, prime status or a fault condition. Systems utilizing an electrode, mechanical means such as a float, or that require any type of electrical or moving parts inside the priming chamber, which may accumulate debris, short out, bind or fail will not be acceptable.
- E. The priming system shall automatically provide positive lubrication of the mechanical seal each time a main pump is primed. To prevent excessive stoppage due to grease accumulation, no passageway in the priming system through which the pumped liquid must pass shall be smaller than the equivalent of a 2-1/2" opening.
- F. The vacuum priming system shall have two field selectable modes of operation. In the "On-Demand" mode, the priming system will operate only after a pump is called on to run, and if it is not primed. Once primed, the pump will be allowed to run. In the "Constant Prime" mode, both pumps are kept primed continuously, and ready to start immediately when called for.
- G. Pump Prime Failure - A time delay relay shall be connected to each vacuum pump. Contacts shall be provided to automatically shut down the operating vacuum pump, allow starting of the next pump in the operating sequence and signal an alarm on excessive vacuum pump operating time. Contacts shall be provided for transmitting an alarm signal.

2.11 SINGLE PHASE 120 VOLT POWER TRANSFORMER

- A. A five (5) KVA insulating-type transformer shall be provided to supply power for lights, controls and auxiliary devices. The transformer shall have 240/480 volt primary, 120/240 volt secondary, Class F insulation, with temperature rise not to exceed 115 C above 40 C ambient. The core and coil assembly shall be given a double dip and bake. The coil shall be protected by a metal housing to prevent damage. The transformer shall be protected by a separate circuit breaker on the supply side.

2.12 ENVIRONMENTAL EQUIPMENT

- A. A ventilating blower shall be provided, capable of delivering 650 cfm at 0.1" static water pressure, in order to remove the heat generated by continuous motor operation. The ventilating blower shall be turned on and off automatically by a preset thermostat. A louvered opening shall cover the discharge.
- B. Auxiliary Station Heater - A 1300/1500 watt, dual range, electric heater with automatic circulating fan, thermostat control and an On/Off switch is to be provided. The heater is to hard-wired and shall not require connection to the station convenience receptacle. The heater shall be rigidly mounted in the station to prevent removal.
- C. Insulated Hood – The fiberglass cover shall have a minimum of 1" thick urethane insulation protected by fiberglass, with an "R" value of 7 or more.

2.13 MAIN PIPING

- A. The first stage pump suction shall be drilled and tapped for a 125-pound American Standard flange for ready connection of the suction riser. The discharge line from each first stage pump shall be fitted with a flanged outlet connected to the suction flange of the corresponding second stage pump. The discharge line from each second stage pump shall be connected to a clapper-type check valve and eccentric plug valve. Size, location and quantity of check valves and plug valves shall be as shown on the drawings.
- B. The check valve shall be of the spring-loaded type with external lever arm and an easily replaced resilient seat for added assurance against vacuum leaks. Check valves shall have stainless steel shaft with replaceable bronze shaft bushings and shall be sealed with an adjustable Teflon seal.
- C. Eccentric Plug Valve, 3-inch thru 12-inch
 1. Nonlubricated type eccentric valves, 3 inch thru 12 inch, shall be rated for 175 psig service at 140 degrees F. Valves shall have drip-tight shutoff with pressure from either direction, and cast iron bodies. Exposed service valves shall have flanged ends in accordance with ASME B16.1 flanged or AWWA C606 grooved end connections.
 2. Plug shall be all metal, matching body with round or rectangular port with no less than 80% of connecting pipe area and coated with Buna-N, welded nickel seats, self-lubricating stainless steel stem bearings, and stem seal multiple V-rings or U-cups with O-rings of nitrile rubber, with grit seals on both upper and lower bearings. Valves to 6"

shall be provided with lever operator. Larger valves shall be equipped with totally enclosed, geared, manual operator with handwheel or 2-inch nut. Size operator for 1.5 times the maximum shutoff pressure differential for direct and reverse pressure, whichever is higher.

- D. Protrusions through the floor plate shall be gas-tight where necessary to effect sealing between the equipment chamber and the wet well. The pump station manufacturer shall extend the suction and discharge connections below the floor plate at the factory, so that field connections can be made without disturbing the gas-tight seals.
- E. The manufacturer of the pump station shall provide a compression-type sleeve coupling with suitable restraint for installation in the common discharge pipe. Provisions shall also be made for tying the coupling to the station floor plate.
- F. Emergency Pumping Connection - The common discharge pipe of the pump station shall be fitted with a branch with a plug valve and male quick-connect fitting with cap, as shown on the plans, to facilitate connection of a portable emergency pump to the force main, to bypass the pump station. The emergency pumping connection shall be housed within the fiberglass cover.

2.14 SPARE PARTS

- A. A complete replacement pump shaft seal assembly shall be furnished with each pump station. The spare seal shall be packed in a suitable container and shall include complete installation instructions. A spare volute gasket and seal gasket shall be provided.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Contractor shall unload and install pump station equipment.
- B. All materials, including lubricants and anchor bolts, equipment, and labor to install the pump shall be provided, installed and/or performed by Contractor.

3.2 FIELD TESTING

- A. A minimum of two eight-hour days of start-up service shall be provided. One day of service shall be provided at initial commission with the second day being provided approximately one month after initial start-up. The second day shall be used to fine-tune the system operation and to provide follow-up training. When discharge piping, electrical connections, and electrical inspection have been completed, the pumping system manufacturer shall be contacted for startup. During start up, the complete pumping system shall be inspected for proper installation, and shall be given a running test of normal start and stop, and fully loaded operating conditions. During this test, each pump shall demonstrate its ability to operate without undue vibration, or overheating and shall demonstrate its general fitness for service. All defects shall be corrected and adjustments made at the expense of the pumping system manufacturer. Test shall be repeated until satisfactory results are obtained. Startup assistance shall be provided but shall be

a minimum of one 8 hour day, and shall continue until satisfactory results are obtained. After the station startup has been completed, but before the technician leaves the job site, a training session of a minimum of four (4) hours shall be given to the owner or the owner's representative to familiarize them with the pumping system operation, maintenance and adjustments. This time shall be in addition to the startup assistance stipulated above.

B. Alignment and Vibration Analysis:

1. The Contractor shall provide a full vibration analysis of the pumping units including the pumps and motors. The measurement locations for the motor shall be recorded at a minimum of five points and the locations for the pump shall be recorded at a minimum of the specified measurement locations called out by the Hydraulic Institute. The frequency spectrum is to be recorded to at least 192,000 CPM with the lines of resolution set at a minimum of 6,400 lines. The vibration analysis shall also include a determination of the natural frequency. A full report showing the frequency response up to a minimum of 25,000 CPM shall be provided, and the analysis must show that the vibration in the preferred operating range of the pumping units is within the latest edition of the standards held by the Hydraulic Institute.
2. Any corrective action required to bring the pumping units into compliance shall be the responsibility of the Contractor.

END OF SECTION 33 32 00

PROJECT MANUAL

DOCUMENTS AND SPECIFICATIONS

CITY OF FRANKLIN, KENTUCKY

STANDARD SPECIFICATIONS FOR PRESSURE AND GRAVITY SEWER

MAYOR
COMMISSIONER
COMMISSIONER
COMMISSIONER
COMMISSIONER

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BILL AUSTIN
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DEPARTMENT FOR NATURAL RESOURCES
AND ENVIRONMENTAL PROTECTION

Approved By:

Tom Gordon, PE
City Engineer/Manager

Tom Gordon

Printed

Date: 8/25/03

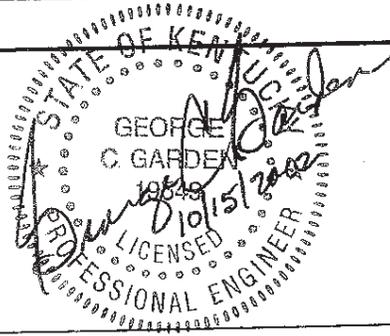
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Expiration Date

SET: _____

QUANTITY REQUIRED BY CONTRACTOR FILE NO.: 25773-01S
TREATMENT FACILITY NO. DATE: OCTOBER 2002



**Barge
Waggoner
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Nashville Tennessee 37201-1815
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Engineers, Architects, Planners
Landscape Architects and Surveyors

DOCUMENT 00001

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GENERAL

This project manual follows the Construction Specifications Institute Format Document Identifying System and Cost Accounting Numbers.

Nonapplicable division and section references have been omitted.

Recipients of bidding instruments must consult the Index to determine the full scope of the work involved and to ensure that all pages of the project manual and drawings have been included.

Neither the Owner nor the A/E will be responsible for bids submitted that are based on incomplete bidding instruments.

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END OF DOCUMENT

SECTION 01031

SPECIAL PROJECT PROCEDURES

1. MANUFACTURERS QUALIFICATIONS

1.1 The manufacturers of all materials and equipment used must be reputable and regularly engaged in the manufacture of the particular material or equipment for the use and service to which it will be subjected.

2. CONTRACTOR SHALL PAY FOR ALL LABORATORY INSPECTION SERVICE

2.1 All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the Contractor and approved by the Owner. Pay for all laboratory inspection services as a part of the Contract. Submit all material test reports to the A/E in triplicate.

3. COMPLIANCE WITH STATE AND LOCAL LAWS

3.1 Comply with all applicable requirements of state and local laws and ordinances to the extent that such requirements do not conflict with federal laws or regulations.

4. PROTECTION OF PUBLIC AND PRIVATE PROPERTY

4.1 Take special care in working areas to protect public and private property. The Contractor shall replace or repair at his own expense any damaged water pipes, power and communication lines, or other public utilities, roads, curbs, gutters, sidewalks, drain pipes, sewer drainage ditches, and all plantings, including grass or sod on the site of the work. Leave the site in original or better condition after all cleanup work has been done.

5. MARKERS

5.1 Preserve all USGS, State of Kentucky, and private markers; do not remove or disturb any such markers without prior approval from the A/E. Any removal and replacement of such markers shall be at the expense of the Contractor.

6. PAVEMENT REPAIR AND/OR REPLACEMENT

6.1 Wherever pipe trenches are cut across or along existing pavement or shoulders, backfill same and restore traffic over the cuts as quickly as possible by constructing a temporary 12 inch surface of Class A, Grade D crushed stone. Add material and otherwise maintain such surface until the permanent pavement is restored or until the entire project is accepted.

7. DEPARTMENT OF HIGHWAYS PERMITS

7.1 The Owner will secure any permits and provide bond as required by the Kentucky Transportation Cabinet Department of Highways or other Agency having jurisdiction for the installation of permanent facilities on highway rights-of way. All such work shall be coordinated with and be subject to the approval of the jurisdiction Agency, in addition to the approval of the A/E. Backfill requirements for utilities in proposed roads and adjacent to proposed roads must meet the requirements of the agency having jurisdiction of the roads upon completion of the project. These requirements take precedence over trenching details in these specifications if more stringent.

8. APPROVED CHEMICALS

8.1 All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant, or other classification, must show approval of either EPA or USDA. The use of all such chemicals and the disposal of residues shall be in strict conformance with instructions.

9. DRAWINGS OF RECORD

9.1 Provide and keep up-to-date a complete record set of blueline prints, which shall be corrected daily to show every change, and the approved shop drawings. Keep this set of prints at the job site, and use only as a record set. This shall not be construed as authorization for the Contractor to make changes in the approved layout without definite instructions in each case. Turn the set over to the A/E upon completion of the project.

10. PRESERVATION OF EXISTING VEGETATION

10.1 Take reasonable care during construction to avoid damage to vegetation. Where the area to be excavated is occupied by trees, brush, or other uncultivated vegetable growth, clear such growth from the area, and dispose of it in a satisfactory manner. Leave undisturbed any trees, cultivated shrubs, flowers, etc., situated within public rights-of-way and/or easements through private property but not located directly within excavation limits. Transplant small ornamental trees, cultivated shrubs, flowers, etc., located directly within excavation limits so they may be replaced

during property restoration operations. Do not remove or disturb any tree larger than six inches 6 inches in diameter without the permission of the A/E. Take special precautions (including the provision of barricades and the temporary tying back of shrubbery and tree branches) for the protection and preservation of such objects throughout all stages of construction; the Contractor will be held liable for any damage that may result to said objects from excavation or construction operations. Trim any limbs or branches of trees broken during construction operations with a clean cut, and paint with an approved tree pruning compound. Treat tree trunks receiving damage from equipment with a tree dressing.

11. UTILITIES

11.1 The Contractor is to contact the owner of all underground utilities before beginning construction in the area. Carefully protect from damage all utilities in the vicinity of the work at all times. If it is necessary to repair, remove, and/or replace any such utility in order to complete the work properly, do so in compliance with the rules and regulations of the particular utility involved. Any such work shall be considered incidental to the construction or repairs of utility lines, and no additional payment will be allowed therefore.

12. SEQUENCING OF WORK

12.1 The Contractor shall coordinate all work with the A/E and the Owner. Work shall be sequenced so that only short term (less than 30 minutes) shut down occur. Contractor shall submit a work plan and schedule for approval by the A/E and the Owner.

END OF SECTION

AISC American Institute of Steel Construction
400 North Michigan Avenue
Eighth Floor
Chicago, IL 60611
(312) 670-2400

AISI American Iron and Steel Institute
1000 16th Street, N.W.
Washington, DC 20036
(202) 452-7100

ANSI American National Standards Institute
1430 Broadway
New York, NY 10018
(212) 354-3300

ASA American Standards Association

ASSE American Society of Sanitary Engineering
P. O. Box 40362
Bay Village, OH 44140
(216) 835-3040

ASTM American Society for Testing and Materials
1916 Race Street
Philadelphia, PA 19103
(215) 299-5400

AWS American Welding Society
550 LeJeune Road
Miami, FL 33135

AWWA American Water Works Association
6666 West Quincy Avenue
Denver, CO 80235

CFR Code of Federal Regulations
Available from Government Printing Office
Washington, DC 20402

CPSC Consumer Product Safety Commission
1111 18th Street, NW
Washington, DC 20207
(202) 634-7700

CSI Construction Specifications Institute
601 Madison Street
Alexandria, Virginia 22314
(703) 684-0300

NSF National Sanitation Foundation
P. O. Box 1468
3475 Plymouth Road
Ann Arbor, MI 48106
(313) 769-8010

OSHA Occupational Safety & Health Administration
US Department of Labor
Government Printing Office
Washington, DC 20402

SBCC Standard Building Code Congress
900 Montclair Road
Birmingham, AL 35213
(205) 591-1853

UL Underwriters' Laboratories, Inc.
333 Pfingston Road
Northbrook, IL 60062
(312) 272-8800

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01568
EROSION CONTROL

PART 1 GENERAL

1.1 DESCRIPTION

- A. This work shall consist of erosion control on all cut and fill operations, excavation, backfill, or other construction activities within the limits of the construction site, within any temporary or permanent easements, and within any borrow site used during the period of construction. The protection of these sites shall continue throughout the construction period. During flood seasons, protect the sites by sandbagging, the pumping of water, and any other means appropriate to restrain flooding of plant and equipment. During dry weather, sprinkle the sites with water or use other means as necessary to provide dust control. In case of abnormally cold weather, any construction such as excavation work may be delayed until warmer weather or covered to prevent freezing.
- B. The temporary pollution control provisions contained herein shall be coordinated with the permanent erosion control features, to ensure economical, effective, and continuous erosion control throughout the construction and post-construction period.
- C. If disturbed areas exceed 5 acres (calculated for line work by the permanent or construction easement width times the length of the line work) at any one time, the developer/contractor is responsible for complying with the storm water permitting requirements of the Kentucky Revised Statutes, Chapter 224, and pursuant to herein. **All erosion control work is considered incidental to the water line construction and no separate payment shall be made for initial installation, maintenance of the control measures until ground cover is re-established, or final removal.**

PART 2 PRODUCTS

2.1 TEMPORARY BERMS

- A. A temporary berm is constructed of compacted soil, with or without a shallow ditch, at the top of fill slopes or transverse to centerline on fills.

- B. These berms are used temporarily at the top of newly constructed slopes to prevent excessive erosion until permanent controls are installed or slopes stabilized.

2.2 TEMPORARY SLOPE DRAINS: A temporary slope drain is a facility consisting of stone gutters, fiber mats, plastic sheets, concrete or asphalt gutters, half round pipe, metal pipe, plastic pipe, sod, or other material that may be used to carry water down slopes to reduce erosion.

2.3 SEDIMENT STRUCTURES: Sediment basins, ponds, and traps, are prepared storage areas constructed to trap and store sediment from erodible areas in order to protect properties and stream channels below the construction areas from excessive siltation.

2.4 CHECK DAMS

- A. Check dams are barriers composed of large stones, sand bags, or other noncorrodible materials placed across or partially crossing a natural or constructed drainway.

2.5 TEMPORARY SEEDING AND MULCHING: Temporary seeding and mulching are measures consisting of seeding, mulching, fertilizing, and matting utilized to reduce erosion. All cut and fill slopes including waste sites and borrow pits shall be seeded when and where necessary to eliminate erosion.

2.6 BALED HAY OR STRAW CHECKS

- A. Baled hay or straw erosion checks are temporary measures to control erosion and prevent siltation. Bales shall be either hay or straw containing 5 cubic feet or more of material.
- B. Baled hay or straw checks shall be used where the existing ground slopes toward or away from the embankment along the toe of slopes, in ditches, or other areas where siltation erosion or water runoff is a problem.

2.7 TEMPORARY SILT FENCES: Silt fences are temporary measures utilizing woven wire or other approved material attached to posts with filter cloth composed of burlap, plastic filter fabric, etc., attached to the upstream side of the fence to retain the suspended silt particles in the runoff water.

PART 3 EXECUTION

3.1 PROJECT REVIEW: Prior to the preconstruction conference the Contractor shall meet with the A/E and go over in detail the expected problem areas in regard to the erosion control work. Different solutions should be discussed so that the best method might be determined. It is the basic responsibility of the

Contractor to develop an erosion control plan acceptable to the A/E. The erosion control plan and spill prevention plans are due at the preconstruction meeting and no construction shall commence until they are approved by the City and in place.

3.2 If the Contractor desires to stockpile construction materials, stone, earth, etc., the location of same and protection thereof shall be outlined in an Erosion and Siltation Control Plan to be submitted to the A/E for review.

3.3 The Contractor shall have a spill prevention plan meeting the requirements of all agencies having jurisdiction. The contents of this spill prevention plan shall depend on what types of chemicals, lubricants and fuels will be used and if these will be stored on site. As a minimum, if no fuel or lubricants or other chemicals are stored on site, either temporarily in vehicular tanks or in skid or trailer mounted tanks, a plan shall be supplied which directs all employees of the Contractor in the proper procedures to be followed should a spill occur. For more complex chemical storage requirements, a more complex plan will be required.

3.4 The Contractor shall have his schedule for accomplishment of temporary and permanent erosion control work, as are applicable for clearing and grubbing, grading, bridges, and other structures at watercourses, construction, and paving. He shall also have his proposed method of erosion control on haul roads and borrow pits and his plan for disposal of waste materials. No work shall be started until the Contractor has the erosion control schedules and methods of operations.

3.5 CONSTRUCTION REQUIREMENTS

A. The A/E has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, the surface of erodible earth material exposed by excavation, borrow and fill operations and to direct the Contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of adjacent streams or other watercourses, lakes, ponds, or other water impoundment. Such work may involve the construction of temporary berms, dikes, dams, sediment basins, slope drains, and use of temporary mulches, mats, seeding or other control devices or methods as necessary to control erosion. Cut and fill slopes shall be seeded and mulched as the excavation proceeds to the extent directed by the A/E.

B. The Contractor shall be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in his accepted schedule. Temporary pollution control measures shall be used to correct conditions that develop during construction that were not foreseen during the

preconstruction stage; that are needed prior to installation of permanent pollution control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

- C. Where erosion is likely to be a problem, clearing and grubbing operations should be so scheduled and performed that grading operations and permanent erosion control features can follow immediately thereafter if the project conditions permit; otherwise erosion control measures may be required between successive construction stages. Under no conditions shall the surface area of erodible earth material exposed at one time by clearing and grubbing, exceed 750,000 square feet without approval of the A/E.
- D. The A/E will limit the area of excavation, borrow, and embankment operations in progress commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding, and other such permanent pollution control measures current in accordance with the accepted schedule. Should seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified.
- E. Under no conditions shall the amount of surface area or erodible earth material exposed at one time by excavation or fill within the project area exceed 750,000 square feet without prior approval by the A/E.
- F. The A/E may increase or decrease the amount of surface area of erodible earth material to be exposed at one time by clearing and grubbing, excavation, borrow and fill operations as determined by his analysis of project conditions.
- G. In the event of conflict between these requirements and pollution control laws, rules or regulations, or other Federal, state, or Local agencies, the more restrictive laws, rules, or regulations shall apply.

3.6 CONSTRUCTION OF STRUCTURES

A. Temporary Berms

- 1. A temporary berm shall be constructed of compacted soil, with a minimum width of 24 inches at the top and a minimum height of 12 inches with or without a shallow ditch, constructed at the top of fill slopes or transverse to centerline on fills.

Temporary berms shall be graded so as to drain to a compacted outlet at a slope drain. The area adjacent to the temporary berm in the vicinity of the slope drain must be properly graded to enable this inlet to function efficiently and with only minimum ponding in this area. All transverse berms required on the downstream side of a slope drain shall extend across the grade to the highest point at approximately a 10 degree angle with a perpendicular to centerline. The top width of these berms may be wider and the side slope flatter on transverse berms to allow equipment to pass over these berms with minimal disruptions. When practical and until final roadway elevations are approached, embankments should be constructed with a gradual slope to one side of the embankment to permit the placement of temporary berms and slope drains on only one side of the embankment.

B. Temporary Slope Drains

1. Temporary slope drains shall consist of stone gutters, fiber mats, plastic sheets, concrete or asphalt gutters, half round pipe, metal pipe, plastic pipe, flexible rubber, or other materials which can be used as temporary measures to carry water accumulating in the cuts and on the fills down the slopes prior to installation of permanent facilities or growth of adequate ground cover on the slopes.
2. Fiber matting and plastic sheeting shall not be used on slopes steeper than 4:1 except for short distances of 20 feet or less.
3. All temporary slope drains shall be adequately anchored to the slope to prevent disruption by the force of the water flowing in the drains. The base for temporary slope drains shall be compacted and concavely formed to channel the water or hold the slope drain in place. The inlet end shall be properly constructed to channel water into the temporary slope drain. Energy dissipators, sediment basins, or other approved devices shall be constructed at the outlet end of the slope drains to reduce erosion downstream. An ideal dissipator would be dumped rock or a small sediment basin which would slow the water as well as pick up some sediment. All temporary slope drains shall be removed when no longer necessary and the site restored to match the surroundings.

C. Sediment Structures

1. Sediment structures shall be utilized to control sediment at the foot of embankments where slope drains outlet; at the bottom as well as in the ditchlines atop waste sites; in the ditchlines or borrow pits. Sediment structures may be used in most drainage situations to prevent excessive siltation of pipe structures. All sediment structures shall be at least twice as long as they are wide.
2. When use of temporary sediment structures is to be discontinued, all sediment accumulation shall be removed, and all excavation backfilled and properly compacted. The existing ground shall be restored to its natural or intended condition.

D. Check Dams

1. Check dams shall be utilized to retard stream flow or restrict stream flow within the channel. Materials utilized to construct check dams are varied and should be clearly illustrated or explained in the Contractor's erosion control plan.
2. All check dams shall be keyed into the sides and bottom of the channel. A design is not needed for check dams.

E. Temporary Seeding and Mulching: Seeding and mulching shall be performed in accordance with the Section 02485, Seeding.

F. Baled Hay or Straw Erosion Checks: Hay or straw erosion checks shall be embedded in the ground 4 to 6 inches to prevent water flowing under them. The bales shall also be anchored securely to the ground by wooden stakes driven through the bales into the ground. Bales can remain in place until they rot, or be removed after they have served their purpose, as determined by the A/E. The Contractor shall keep the checks in good condition by replacing broken or damaged bales immediately after damage occurs. Normal debris cleanout will be considered routine maintenance.

G. Temporary Silt Fences

1. Temporary silt fences shall be placed on the natural ground, at the bottom of fill slopes, in ditches, or other areas where siltation is a problem. Silt fences are constructed of wire mesh fence with a covering of burlap or some other

suitable material on the upper grade side of the fence and anchored into the soil.

2. The Contractor shall be required to maintain the silt fence in a satisfactory condition for the duration of the project or until its removal is requested by the A/E. The silt accumulation at the fence may be left in place and seeded, removed, etc., as directed by the A/E. The silt fence becomes the property of the Contractor whenever the fence is removed.

- H. Under no circumstances will spent oil wastes be discharged anywhere on the site.

3.7 MAINTENANCE

- A. The temporary erosion control features installed by the Contractor shall be acceptably maintained by the Contractor until no longer needed or permanent erosion control methods are installed. Any materials removed shall become the property of the Contractor.

3.8 EROSION CONTROL OUTSIDE PROJECT AREA: Temporary pollution control shall include construction work outside the project area where such work is necessary as a result of construction such as borrow pit operations, haul roads, and equipment storage sites.

END OF SECTION

SECTION 02080

ASBESTOS ABATEMENT PROCEDURES

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. General: This section includes all work necessary to reduce air concentrations of asbestos to the specified level and maintain the specified asbestos control limits during the life of the contract. It also includes removal, containment, and disposal of asbestos-containing transite water piping identified in the Drawings in the Contract Documents.
- B. Related Work Specified in Other Sections: Section 01546, "Safety and Health," applies to all work covered by this section.

1.2 QUALITY ASSURANCE

- A. Contractor Qualifications: The Contractor shall be licensed in the Commonwealth of Kentucky and shall be a firm of established reputation (or if newly organized, whose personnel have previously established a reputation in the same field) which is regularly engaged in, and which maintains a regular force of workmen skilled in asbestos abatement, and shall have performed this work on previous projects. See "Submittals" paragraph for information which must be submitted and approved.
- B. Asbestos Control Limits:
 - 1. Inside Asbestos Work Area: Air concentrations of asbestos shall not exceed an average of 0.10 fibers (longer than 5 microns) per cubic centimeter of air and shall not exceed at any time the ceiling level of 1.0 fibers (longer than 5 micrometers) per cubic centimeter of air.
 - 2. Outside Asbestos Work Area: Air concentrations of asbestos shall be maintained below 0.01 fibers (longer than 5 microns) per cubic centimeter of air. This applies to all areas adjacent to the work area while work is in progress, and to the former work area after final cleanup.

1.3 REFERENCES

A. Code of Federal Regulations (CFR):

29 CFR 1910 - Subpart C: General Safety and Health Provisions

29 CFR 1926.1101 - Asbestos OSHA Standards for Construction

40 CFR 61 - Subpart M: USEPA National Emission Standards for Hazardous Air Pollutants (NESHAPS) - Asbestos

29 CFR 1926 - Subpart E: Personal Protective and Life Saving Equipment

B. State and Local Regulations, Contact:

Mr. Parker Moore
KENTUCKY DIVISION FOR AIR QUALITY
803 Schenkel Lane
Frankfort, Kentucky 40601
(502) 573-3382

1.4 SUBMITTALS

A. Submittals Prior to Beginning Work: Do not start work until following have been approved:

1. Copy of the Contractor's asbestos abatement license for the Commonwealth of Kentucky.
2. Testing Company Qualifications:
 - a. Submit proof of the laboratory being accredited by the American Industrial Hygiene Association (AIHA) for asbestos or show documented proof of equivalent technical qualifications.
 - b. Air Monitoring Strategy: Provide an air monitoring strategy for the safe accomplishment of the project.
3. Asbestos Worker Training: Provide documentation showing that supervisors and workers have completed the appropriate training course and have the appropriate Kentucky certification.
4. Disposal Methods: Provide a detailed description of the method for disposal of ACM and asbestos contaminated materials. Included in this shall be name, address, and telephone number of the disposal facility, copy of the Waste Shipment Record (WSR) to be used, and the name, address, and telephone number of the waste transporter.

5. Provide a copy of the asbestos project notification that was made to the state regulatory authority, if applicable.
6. Chemical and Equipment List: Provide a comprehensive list of chemicals and equipment to be used on the project site. Include manufacturer's installation and use recommendations. Include Material Safety Data Sheets (MSDS) for caulks, encapsulants, paints and similar materials.

B. Project Closeout Submittals: These submittals must be submitted and accepted for the project to be considered complete.

1. Copies of all air monitoring and inspection reports from the Contractor's Asbestos Testing Company.
2. Copies of all Waste Shipment Records for the disposal of ACM waste.

1.5 CONTRACTOR RESPONSIBILITY: The Contractor shall assume full responsibility and liability for compliance with all applicable federal, state, and local regulations pertaining to the protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable federal, state, and local regulations, and shall hold the Owner harmless for failure to comply with any applicable safety or health regulation on the part of himself, his employees, or his subcontractors.

A. Suspect Material: During the course of the project, if work involves disturbance of suspect material not identified in the Contractor's Proposal in the Contract Documents, the Contractor shall have the material tested for asbestos content. If the material tested contains asbestos, Parts 1.4B and 2.2 of Section 01546, "Safety and Health," shall apply.

B. Safety: The Contractor shall have full responsibility for the safe accomplishment of all asbestos abatement work included in this project.

1.6 PROJECT/SITE CONDITIONS

A. Means of Egress: Establish and maintain emergency and fire exits from the work area. The Contractor shall identify and mark all emergency exits from the work area. At least 1 emergency exit from the work area shall be provided in addition to the exit through the decontamination facility.

B. Use of Existing Facilities: Not Applicable

- C. Air Handling Equipment: Not Applicable
- D. Access to Work Area: Access to work areas shall be through decontamination areas. Only the Contractor's workers, governmental agency inspectors, authorized employees of the Government, the Owner and his representatives, and testing laboratory personnel shall have access to work areas.
- E. Environmental Conditions to be Maintained: Not Applicable
- F. Use of Elevators: Not Applicable
- G. Contamination of Adjacent Areas: In the event any area in the building outside of a controlled work area should become contaminated as a result of the Contractor's work, the Contractor shall thoroughly decontaminate the affected area until the area has been visually inspected and the airborne fiber counts are at or below the ambient readings taken before the work was started.
- H. Security: At all times asbestos control measures are in effect, the Contractor shall provide adequate security to prevent any unauthorized entry into a work area. These work areas shall never be left unattended unless access can be positively blocked. Asbestos contaminated waste materials shall also be provided adequate security to prevent access to the materials by unauthorized persons.
- I. Coordination of Work of All Trades: Coordinate the work of all trades to ensure that their work is performed in accordance with the applicable regulations and that the asbestos control limits are maintained at all times both inside and outside the asbestos work area.

1.7 SEQUENCING/SCHEDULING

- A. Asbestos abatement work is required to be completed before work can be started in the areas where asbestos-containing materials might be disturbed.

PART 2 PRODUCTS

2.1 EQUIPMENT: Equipment, including protective clothing and respirators, used in the execution of this contract and provided to visitors to the site shall comply with applicable Federal, State, and local regulations. Respirators shall conform to the OSHA requirements in 29 CFR 1926.1101.

2.2 SEALERS

- A. Sealers shall be used following asbestos removal from a substrate to bond residual microscopic fibers to the substrate.
- B. Sealers shall be manufactured by reputable, established manufacturers of encapsulants, shall be approved specifically for use in asbestos contaminated environments, and shall be compatible for use with the applicable substrates and replacement materials in this project. Sealers shall always be used in compliance with the manufacturer's instructions. Unless otherwise specified for specific locations in Part 1.1 of this section, sealers shall have a distinctive coloration so as to be visible when dry.

PART 3 EXECUTION

3.1 PROHIBITIONS

- A. The following work practices and engineering controls shall not be used for work related to asbestos or for work which disturbs ACM, regardless of measured levels of asbestos exposure or the results of initial exposure assessments:
 - 1. High-speed abrasive disc saws that are not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air.
 - 2. Compressed air used to remove asbestos, or materials containing asbestos, unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.
 - 3. Dry sweeping, shoveling or other dry clean-up of dust and debris containing ACM and PACM.
 - 4. Employee rotation as a means of reducing employee exposure to asbestos.

3.2 ASBESTOS ABATEMENT OF ASBESTOS CONTAINING TRANSITE WATER PIPE

- A. Outside Work Areas: Prepare work areas by placing warning signs and asbestos warning ribbon around perimeter of work area if ACM Transite Water Pipe is being cut other than with a tapping sleeve and valve.
- B. Removal of ACM Transite Water Pipe:
 - 1. General: Perform all asbestos related work and comply with the general safety and health provisions in conformance with 29 CFR 1926.1101.

When work involves removal of only ACM transite water pipe, a decontamination unit may not be required. However, disposable clothing and respiratory protection will be required. Disposable clothing may be worn over street clothing. Discard and dispose of the disposable clothing as asbestos contaminated waste when leaving the work area.

2. Keep ACM moist by spray misting with amended water during removal. Material shall be kept wet until packaged for disposal.
3. Avoid breaking up the material where possible.
4. Pieces of ACM too large to bag or with sharp points that could penetrate disposal bags shall be wrapped with a double layer of 6 mil plastic. Each layer shall be taped closed moisture tight. Label the outside layer with the appropriate warning sign.
5. Smaller pieces of ACM and debris that could be contaminated shall be double bagged in proper asbestos disposal bags then placed in rigid containers for transportation.

C. Special Safety Precautions: Discontinue all work if either of the following conditions develop:

1. Wind velocities or gusts in the work area exceed 15 miles per hour.
2. Air samples taken downwind at the perimeter of the work area show airborne fiber counts 0.02 f/cc or greater.

3.3 FIELD QUALITY CONTROL

A. Air Monitoring and Work Inspection

1. The Contractor shall engage an independent asbestos testing company to provide the following services:
 - a. Visual Inspections
 - (1) Conduct joint inspection with the Contractor of work area enclosures when preparation work is complete. Smoke test to verify integrity of the enclosure.
 - (2) Inspect the asbestos work at least 4 times daily while work is in progress to observe the following work practices:
 - (a) Maintenance of the integrity of the work area enclosure.
 - (b) Proper use of decontamination unit by all persons entering and leaving the work area.
 - (c) Use of the approved asbestos working procedures by the Contractor's employees.

- (d) Disposal and transport of waste.
- (e) Dismantling the work area enclosure and cleanup.
- (f) Coordination of non-abatement work in the project with the abatement work.
- (g) Sufficiency of warning signs posted and labeling on waste materials packaged for disposal.

Record the performance of all inspections and the inspection results. Sign each inspection report. The Contractor shall provide the Owner copies of all inspection reports.

- (3) Conduct joint inspection with the Contractor to verify completion of abatement work before the final cleaning work begins. Inspect again after final cleaning is completed. Verify that no visual trace of dust or debris is present in the work area.

b. Air Monitoring

- (1) Prepare an air monitoring strategy for safe accomplishment of the project. The Contractor shall provide a copy of the air monitoring strategy to the Owner.
- (2) Conduct all air monitoring. This includes ambient monitoring before preparation work is started, personal monitoring, area monitoring inside and outside of work areas while work is in progress, and final clearance monitoring.
- (3) While work is in progress, if monitoring shows airborne concentrations greater than the asbestos control limits, the Contractor shall stop all work and correct the conditions causing the excessive levels. When conditions causing excessive airborne fiber levels have been corrected and the fiber levels have been lowered to below the control limits, work may resume. Such time delays shall be at the Contractor's expense.
- (4) Provide copies of all air monitoring reports to the Owner.
- (5) Air sample analysis shall be by PCM in accordance with NIOSH Method 7400, OSHA Reference Method (ORM), or the equivalent.

B. Site Inspections

1. While performing asbestos abatement work, in addition to inspection by the Owner or the Owner's Representative, the Contractor shall be subject to on site inspection by agency officials; by OSHA and EPA inspectors; and state enforcement officials.
 - a. The Owner may also engage the services of an independent inspector not employed by or associated with the Contractor to conduct additional inspections and/or air monitoring as necessary to ensure that the air monitoring and work inspections specified in Part 3.8A are properly performed.
 - b. Upon request, the Owner's independent inspector shall be provided unanalyzed filters for air samples taken by the Contractor's asbestos consultant. These filters shall be analyzed by a laboratory designated by the Owner.
2. If found to be in violation of 40 CFR 61 Subpart M, 29 CFR 1926.1101, applicable state and local regulations, or not in compliance with these specifications, the Contractor shall cease all work immediately and until the violation or non-compliance is resolved. Standby time and any additional air monitoring cost required to resolve the infraction shall be at the Contractor's expense.
3. The Contractor shall keep available 2 complete sets of equipment required for entry into the asbestos control area for use by compliance inspectors and other authorized visitors. The equipment shall be made available upon request after presentation of proper identification.

3.4 CLEANUP AND DISPOSAL

- A. Housekeeping: Essential parts of asbestos dust control actions are housekeeping and cleanup procedures. Maintain all surfaces in the work area free of accumulations of contaminated debris to prevent further dispersion. Use approved industrial vacuum cleaners equipped with a HEPA filter to collect dust and small scrap. The blowing down of the space with compressed air is forbidden. Post appropriate asbestos hazard warning signs. In all possible instances, workmen shall cleanup their own areas. Equip personnel engaged in cleaning up asbestos scrap and waste with necessary respiratory equipment and protective clothing.

B. Disposal of Contaminated Waste:

1. Collect and dispose of friable asbestos waste, scrap, debris, bags, containers, consumable hand tools, and asbestos contaminated clothing which may produce airborne concentrations of asbestos fibers in sealed impermeable bags. Double bag prior to removing waste from work area. Prior to placing in bags, or containers, wet down asbestos wastes to minimize airborne fibers.
2. Asbestos waste materials shall be disposed of in accordance with all federal regulations at a sanitary landfill approved for asbestos by the appropriate state or local authority.
3. Establish a temporary holding area approved by the Owner for properly packaged asbestos waste. Waste must be transported to the landfill in a covered vehicle or in sealed, rigid, impermeable containers.
4. Provide copies of all waste shipment records to the Owner.

C. Final Cleaning and Visual Inspection:

1. All final cleaning shall be accomplished using HEPA vacuums and wet wiping methods. No visible dust or debris is allowed in the work area.
2. The final visual inspection will be conducted jointly by the Contractor and the Contractor's Asbestos Testing Company. When the area has passed inspection the final clearance air sampling will be performed.

D. Final Clearance Monitoring and Removal of Enclosure:

1. Final clearance air samples shall be taken for analysis by PCM.
2. Three samples shall be taken in each work area. If any sample in a work area exceeds 0.01 f/cc, the work area must be recleaned and resampled. This will be repeated until satisfactory results are obtained.
 - a. Use aggressive sampling procedures in work areas where all ACM was removed.
 - b. Use passive sampling procedures in work areas where ACM was only selectively removed and some ACM still remains in the area.
 - c. When final clearance air monitoring is satisfactory all surfaces shall be sealed. Any pooling of sealer must be wiped up. The area must dry before the work area enclosure may be removed.

3. Warning signs and work area enclosures shall be removed when the work area has passed final visual inspection, satisfactory final air monitoring results have been obtained, and all sealed surfaces are dry.

END OF SECTION

SECTION 02222

UNCLASSIFIED EXCAVATION FOR UTILITIES

PART 1 GENERAL

1.1 The work called for by this section shall consist of clearing and grubbing, loosening, loading, removing, and disposing of, in the specified manner, all wet and dry materials (including rock) encountered that must be removed for construction purposes; furnishing, placing, and maintaining all sheeting, shoring, bracing, and timbering necessary for the proper protection and safety of the work, the workmen, the public, and adjacent property and improvements; the dewatering of trenches and other excavations; the preparation of satisfactory pipe beds; the backfilling and tamping of trenches, foundations, and other structures; the preparation of fills and embankments; the removal of unsuitable material from outside the normal limits of excavation and, where ordered by the A/E, their replacement with suitable materials; and all other grading or excavation work incidental to or necessary for the work. This work shall be performed as specified below.

PART 2 EXECUTION

2.1 PREPARATION OF THE SITE

- A. Before starting construction, remove from the work site all vegetable growth (except as hereinafter excluded), debris, and/or other objectionable matter as well as any buildings and/or other structures that the Drawings and/or the A/E specifically indicate are to be removed. Dispose of this refuse material in an acceptable manner.
- B. Take reasonable care during construction to avoid damage to vegetation. Where the area to be excavated is occupied by trees, brush, or other uncultivated vegetable growth, clear such growth from the area, and dispose of it in a satisfactory manner. Leave undisturbed any trees, cultivated shrubs, flowers, etc., situated within public rights-of-way and/or easements through private property but not located directly within excavation limits. Transplant small ornamental trees, cultivated shrubs, flowers, etc., located directly within excavation limits so they may be replaced during property restoration operations. Do not remove or disturb any tree larger than 6 inches in diameter without the permission of the A/E. Take special precautions (including the provision of barricades and the temporary tying back of shrubbery and tree branches) for the protection and preservation of such objects throughout

all stages of construction; the Contractor will be held liable for any damage that may result to said objects from excavation or construction operations. Trim any limbs or branches of trees broken during construction operations with a clean cut, and paint with an approved tree pruning compound. Treat tree trunks receiving damage from equipment with a tree dressing.

- C. If the area to be excavated is occupied by trees, brush, or other vegetable growth, clear such growth and grub the excavated area, and remove all large roots to a depth of not less than 2 feet below the bottom of the proposed construction. Dispose of the growth removed in a manner satisfactory to the A/E. Fill all holes or cavities created during this work that extend below the subgrade elevation with suitable material, and compact to the same density as the surrounding material.
- D. Preparation of the site shall be considered an integral part of the excavation and one for which no separate payment shall be allowed.

2.2 EXCAVATION FOR TRENCHES, MANHOLES, AND STRUCTURES

- A. Unclassified excavation for pipelines shall consist of the excavation necessary for the construction of water, sewer, and other pipes and their appurtenances (including manholes, inlets, outlets, headwalls, collars, concrete saddles, and pipe protection) that are called for by the Contract Documents. It shall include clearing and grubbing where necessary, backfilling and tamping pipe trenches and around structures, and disposing of waste materials, all of which shall conform to the applicable provisions set forth elsewhere in these specifications.
- B. The Contractor may, if he chooses, use a motor powered trenching machine. If he does, however, he shall be fully responsible for the preservation or repair of existing utility service connections. Also, the minimum trench width shall be 10 inches on each side of the pipe.
- C. Unless the construction of lines by tunneling, jacking, or boring is called for by the Drawings or specifically authorized by the A/E, make excavation for pipelines in open cut and true to the lines and grades shown on the Drawings or established by the A/E on the ground. Cut the banks of trenches between vertical parallel planes equidistant from the pipe centerline. The horizontal distance between the vertical planes (or, if sheeting is used, between the inside faces of that sheeting) shall vary with the size of the pipe to be installed, but shall not be less than 10 inches on each side of the pipe for

sizes 12 inches and smaller and not less than 12 inches on each side for pipe sizes 15 inches and larger. When approved in writing by the A/E, the banks of trenches from the ground surface down to a depth not closer than 1 foot above the top of the pipe may be excavated to nonvertical and nonparallel planes, provided the excavation below that depth is made with vertical and parallel sides equidistant from the pipe centerline in accordance with the dimensions given above. Any cut made in excess of that previously stated may be cause for the A/E to require that stronger pipe and/or a higher class of bedding be used.

- D. For all pipe, shape the bottom of all trenches to provide uniform bearing for the bottom of the pipe barrel. For plastic and ductile iron water and sewer lines, provide a minimum of 6 inches of #9 sized crushed stone for bedding.
- E. Excavate bell holes for bell and spigot pipe at proper intervals so that the barrel of the pipe will rest for its entire length upon the bottom of the trench. Bell holes shall be large enough to permit proper jointing of the pipe. Do not excavate bell holes more than 2 joints ahead of pipe laying.
- F. Excavation for manholes, inlets, and other incidental structures shall not be greater in horizontal area than that required to allow a 2 feet clearance between the outer surface of the structure and the walls of the adjacent excavation or of the sheeting used to protect it. The bottom of the excavation shall be true to the required shape and elevation shown on the Drawings. No earth backfilling will be permitted under manholes, inlets, headwalls, or similar structures. Should the Contractor excavate below the elevations shown or specified, he shall, at his own expense, fill the void with either concrete or clean 1/2 inch to 3/4 inch sized crushed stone.
- G. Do not excavate pipe trenches more than 200 feet ahead of the pipe laying, and perform all work so as to cause the least possible inconvenience to the public. Construct temporary bridges or crossings when and where the A/E deems necessary to maintain vehicular or pedestrian traffic.
- H. In all cases where materials are deposited along open trenches, place them so that in the event of rain no damage will result to the work and/or to adjacent property.

- I. Excavation for manholes and other structures may be performed with nonvertical banks except beneath pavements or adjoining existing improvements. Do not permit the horizontal area of the excavation to exceed that required to allow a 2 feet clearance between the outer surface of the structure and the banks of the excavation or the sheeting used to protect the embankments. The bottom of the excavation shall be true to the required shape and elevation shown on the Drawings.
- J. Where concrete pipe cradle is shown on the Drawings, excavate the bottom of the trench to a minimum depth of 6 inches or 1/4 the inside diameter of the pipe, whichever is greater. Concrete cradle shall conform to the details on Standard Drawing 111. Where concrete protection or concrete cap is called for on the Drawings, it shall conform to the details on Standard Drawing 112 or 120, as applicable.

2.3 UNSUITABLE MATERIALS

- A. Wherever muck, quicksand, soft clay, swampy ground, or other material unsuitable for foundations, subgrade, or backfilling is encountered, remove it and continue excavation until suitable material is encountered. The material removed shall be disposed of in the manner described below. Then refill the areas excavated for this reason with 1 inch to 2 inch sized crushed stone up to 6 inches below the level of the lines, grades, and/or cross sections shown on the Drawings. The top 6 inches of this refill shall be 1/2 inch to 3/4 inch sized crushed stone for bedding.

2.4 ROCKS AND BOULDERS

- A. Any material that is encountered within the limits of the required excavation that cannot be removed except by drilling and/or blasting, including rock, boulders, masonry, hard pan, chert, shale, street and sidewalk pavements, and/or similar materials, shall be considered as unclassified excavation, and no separate payment will be made therefore.
- B. Should rock be encountered in the excavation, remove it by blasting or otherwise. Where blasts are made, cover the excavation with enough excavation material and/or timber or steel matting to prevent danger to life and property. The Contractor shall secure, at his own expense, all permits required by law for blasting operations and the additional hazard insurance required. Observe all applicable laws and ordinances pertaining to blasting operations.

- C. Excavate rock over the horizontal limits of excavation and to a depth of not less than 6 inches below the bottom of pipe if rock extends to such depth. Then backfill the space below grade with #9 inch sized crushed stone or other approved material, tamp to the proper grade, and make ready for construction.

2.5 DISPOSAL OF MATERIALS

- A. Whenever practicable, all materials removed by excavation that are suitable for backfilling pipe trenches or for other purposes shown on the Drawings or directed by the A/E shall be used for these purposes. Any materials not so used shall be considered waste materials and disposed of by the Contractor as specified below.
- B. Waste materials may be deposited in spoil areas at approved locations. Do not leave in unsightly piles but instead spread in uniform layers, neatly level, and shape to drain. Seed as specified in Section 02485, Seeding.
- C. Once any part of the work is completed, properly dispose of all surplus or unused materials (including waste materials) left within the construction limits of that work. Leave the surface of the work in a neat and workmanlike condition.
- D. The disposal of on-site materials shall be considered an integral part of the excavation work and one for which no separate payment shall be allowed.

2.6 SHEETING, SHORING, AND BRACING

- A. Take special care to avoid damage wherever excavation is being done. Sufficiently sheet, shore, and brace the sides of all excavations to prevent slides, cave-ins, settlement, or movement of the banks and to maintain the specified trench widths. Use solid sheets in wet, saturated, or flowing ground. All sheeting, shoring, and bracing shall have enough strength and rigidity to withstand the pressures exerted, to keep the walls of the excavation properly in place, and to protect all persons and property from injury or damage. Separate payment will not be made for sheeting, shoring, and bracing, which are considered an incidental part of the excavation work.
- B. Wherever employees may be exposed to moving ground or cave-ins, shore and lay back exposed earth excavation surfaces more than 5 feet high to a stable slope, or else provide some equivalent means of protection. Effectively protect trenches less than 5 feet deep when examination

of the ground indicates hazardous ground movement may be expected. Guard the walls and faces of all excavations in which employees are exposed to danger from moving ground by a shoring system, sloping of the ground, or some equivalent protection.

- C. Comply with all OSHA standards in determining where and in what manner sheeting, shoring, and bracing are to be done. The sheeting, shoring, and bracing system shall be designed by a professional engineer licensed in the Commonwealth of Kentucky. The Contractor shall be solely responsible for the safety of all employees, the effectiveness of the system, and any damages or injuries resulting from the lack or inadequacy of sheeting, shoring, and bracing.
- D. Where excavations are made adjacent to existing buildings or structures or in paved streets or alleys, take particular care to sheet, shore, and brace the sides of the excavation so as to prevent any undermining of or settlement beneath such structures or pavement. Underpin adjacent structures wherever necessary.
- E. Do not leave sheeting, shoring, or bracing materials in place unless this is called for by the Drawings, ordered by the A/E, or deemed necessary or advisable for the safety or protection of the new or existing work or features. Remove these materials in such a manner that the new structure or any existing structures or property, whether public or private, will not be endangered or damaged and that cave-ins and slides are avoided.
- F. Fill and compact all holes and voids left in the work by the removal of sheeting, shoring, or bracing as specified herein.
- G. The Contractor may use a trench box, which is a prefabricated movable trench shield composed of steel plates welded to a heavy steel frame. The trench box shall be designed to provide protection equal to or greater than that of an appropriate shoring system.

2.7 THE DEWATERING OF EXCAVATION

- A. Provide and keep in operation enough suitable pumping equipment whenever necessary or whenever directed to do so by the A/E. Give special attention to excavations for those structures that, prior to proper backfilling, are subject to flotation from hydrostatic uplift.

2.8 BORROW EXCAVATION

- A. Whenever the backfill of excavated areas or the placement of embankments requires more material than is available from authorized excavations, or whenever the backfill material from such excavations is unsuitable, then obtain additional material from other sources. This may require the opening of borrow pits at points accessible to the work. In such cases, make suitable arrangements with the property owner and pay all incidental costs, including any royalties, for the use of the borrowed material. Before a borrow pit is opened, the quality and suitability of its material shall be approved by the A/E.
- B. Excavate borrow pits in such a way that the remaining surfaces and slopes are reasonably smooth and that adequate drainage is provided over the entire area. Construct drainage ditches wherever necessary to provide outlets for water to the nearest natural channel, thus preventing the formation of pools in the pit area. Leave the sides of borrow pit cuts at a maximum slope of 2:1 unless otherwise directed by the A/E.
- C. Properly clear and grub borrow pits, and remove all objectionable matter from the borrow pit material before placing it in the backfill.
- D. The taking of materials from borrow pits for use in the construction of backfill, fills, or embankments shall be considered an incidental part of the work.

2.9 BACKFILLING

- A. Begin backfilling after the line construction is completed and then inspected by the A/E. On each side of the line, from the bottom of barrel to 1 foot above the top of the pipe, the backfill material shall consist of clean #9 sized crushed stone. Place this backfill simultaneously on either side of the pipe in even layers that before compaction are no more than 6 inches deep. Thoroughly and completely tamp each layer into place before placing additional layers. When shown on the Drawings, or directed by the A/E, this backfill shall, at locations beneath or within 2 feet adjacent to pavement, consist of 1/2 inch to 3/4 inch crushed stone.
- B. From 1 foot above the pipe upward, the backfill material may contain broken stones that make up approximately 3/4 of the backfill's total volume. However, if this type of backfill is used, there must be enough spalls and earth materials to fill all voids completely. The maximum

dimension of individual stones in such backfill shall not exceed 6 inches, and the backfill material shall be placed and spread in even layers not more than 12 inches deep. At locations beneath or within 2 feet adjacent to pavement or at locations of improvements subject to damage by displacement, backfill material shall consist of clean 1/2 inch to 3/4 inch sized crushed stone, properly consolidated. In other areas, the backfill for the upper portion of the trenches may be placed without tamping, but shall be compacted to a density equivalent to that of adjacent earth material. Use special care to prevent the operation of backfilling equipment from causing any damage to the pipe.

- C. If earth material for backfill is too dry to allow thorough compaction, then add enough water so that the backfill can be properly compacted. Do not place earth material that is too wet or otherwise unsuitable.
- D. Wherever excavation has been made within easements across private property, the top 2 feet of backfill material shall consist of fine loose earth free from large clods, vegetable matter, debris, stone, and/or other objectionable materials.
- E. Wherever trenches have been cut across or along existing pavement, temporarily pave the backfill of such trenches by placing Class A, Grade D, crushed stone as the top 12 inches of the backfill. Maintain this temporary pavement until the permanent pavement is restored.
- F. Conduct backfilling around manholes, inlets, outfalls, and/or structures in the same manner as specified above for pipelines except that even greater care is necessary to prevent damage to the utility structure.
- G. Wherever pipes have diameters of 15 inches or less, do not use power operated tampers to tamp that portion of the backfill around the pipe within 1 foot above the pipe.
- H. Perform backfilling so as not to disturb or injure any pipe and/or structure against which the backfill is being placed. If any pipe or structure is damaged and/or displaced during backfilling, open up the backfill and make repairs are necessary.
- I. Backfilling and clean-up operations shall closely follow pipe laying; failure to comply with this provision will result in the A/E's requiring that the Contractor's other activities be suspended until backfilling and clean-up operations catch up with pipe laying.

- J. Compaction Requirements: Under building and 2 times the depth of pipe beyond, and under roads and 2 times the depth beyond the shoulder, compact to 95 percent maximum density in accordance with ASTM D698. In all other locations, compact to 90 percent maximum density.

2.10 MAINTENANCE

- A. Seed and maintain in good condition all excavated areas, trenches, fills, embankments, and channels until final acceptance by the Owner.
- B. Maintain trench backfill at the approximate level of the original ground surface by periodically adding backfill material wherever necessary and whenever directed to do so by the A/E. Continue such maintenance until 1 year after final acceptance of the project, or until the A/E issues a written release.

2.11 SLOPES

- A. Neatly trim all open cut slopes, and finish to conform either with the slope lines shown on the Drawings or the directions of the A/E. Leave the finished surfaces of bottom and sides in reasonably smooth and uniform planes like those normally obtainable with hand tools, though the Contractor will not be required to use hand methods if he is able to obtain the required degree of evenness with mechanical equipment. Conduct grading operations so that material is not removed or loosened beyond the required slope.

END OF SECTION

SECTION 02444

GALVANIZED CHAIN LINK FENCING

PART 1 GENERAL

- 1.1 If alternative materials are proposed, submit complete specifications and shop drawings for the A/E's approval.
- 1.2 Fencing and all accessories shall be produced by a single manufacturer. Submit 3 copies of the manufacturer's technical data and installation instructions.
- 1.3 Refer to other Sections for work related to that specified under this heading.

PART 2 PRODUCTS

2.1 POSTS, RAILS, AND BRACES

- A. All structural and roll formed shapes shall conform to the provisions of ASTM A123 for galvanized coating.
- B. All tubular members shall comply with the provisions of ASTM F1083, Schedule 40, for weight and coating or be high strength triple coated steel in accordance with ASTM A569.
- C. End, Corner, and Pull Post: For fence up to and including 12 feet 0 inches in height, 3-1/2 inches by 3-1/2 inches roll formed corner section shall have a minimum bending strength of 452 pounds (2.875 inches outside diameter, Schedule 40 pipe with a minimum bending strength of 381 pounds at 6 feet).
- D. Line Posts (10 feet 0 inches Maximum Spacing):
 1. Fabric Up To 8 feet 0 inches in Height: C-section, standard roll formed, 1.875 inches by 1.625 inches with a minimum bending strength of 245 pounds (1.90 inches outside diameter, Schedule 40 or high strength pipe with a minimum bending strength of 117 pounds)
- E. Gate Posts:
 1. Gate Leaves Up To and Including 6 feet 0 inches Wide: 3-1/2 inches by 3-1/2 inches roll formed section (2.875 inches outside diameter, Schedule 40 or high strength steel pipe)

2. Gate Leaves Over 6 feet 0 inches and Up To and Including 13 feet 0 inches Wide: 4 inches outside diameter, Schedule 40 pipe or high strength steel pipe

F. Top Rail:

1. The top rail shall be a 1.625 inches by 1.25 inches roll formed section with a minimum bending strength of 192 pounds (1.660 inches outside diameter, Schedule 40 pipe with a minimum bending strength of 202 pounds at 10 feet).
2. Furnish in the manufacturer's standard lengths of approximately 21 feet 0 inches, with couplings approximately 7 inches long. One coupling in each five shall have an expansion spring. Provide means for attaching top rails securely to each gate, corner, pull, and end posts. The top rail shall form a continuous brace from end to end to each run of fence.

G. Tension Wire: 7 gauge galvanized or aluminum coated coil spring wire

H. Post Bracing Assembly: to match top rail. Brace rail assembly shall be complete with a 3/8 inch diameter rod and adjustable take-up.

2.2 CHAIN LINK FABRIC

- A. The fabric shall consist of one piece fabric widths for fences up to 12 feet 0 inches - 2 inches mesh, 9 gauge or 11 gauge, as indicated on the Drawings.
- B. Selvage Edges: Fabric in heights 60 inches and less shall be knuckled at both selvages. Fabric 72 inches and more shall be knuckled at the bottom selvage and be twisted and barbed at the top.
- C. Finishes: heavy galvanized, 2.0 ounces of zinc per square foot, complying with ASTM A392, Class II, or aluminum coated with 0.40 ounces of aluminum per square foot, complying with ASTM A491, Class II

2.3 ACCESSORIES

- A. All accessories, except tie wires and barbed wire, shall be galvanized to comply with ASTM A153.
- B. Barbed Wire Supporting Arms: heavy pressed steel, complete with provisions for anchorage to tubular end, corner, and pull posts attaching 3 rows of barbed wire to

each arm. Barbed wire arms are not required on roll formed terminal posts. Single arms shall be integral with a post top weather cap. Intermediate arms shall have a hole for the passage of the top rail. Arms shall be capable of withstanding, without failure, 250 pounds downward pull at outermost end of arm.

- C. Barbed Wire: 3 strand, 12-1/2 gauge wire with 14 gauge, 4 point round barbs spaced approximately 5 inches on center, with finishes as follows:
 - 1. Galvanized: ASTM A121, Class 3
 - 2. Aluminized: ASTM A585, Class 2
- D. Post Tops: pressed steel or malleable iron (designed as a weathertight closure cap for tubular posts). Where top rail is used, provide tops to permit the passage of the top rail.
- E. Stretcher Bars (for tubular end, corner, pull, or gate posts only): one piece lengths equal to the full height of the fabric, with a minimum cross section of 3/16 inch by 3/4 inch. Provide one stretcher bar for each gate and end post and two for each corner and pull post.
- F. Stretcher Bar Bands: heavy pressed steel spaced not over 15 inches on center to secure stretcher bars to tubular end, corner pull, and gate post
- G. Wire Ties: For tying fabric to line posts, use 11 gauge steel wire clips for C-section posts and a minimum 9 gauge aluminum wire ties for tubular posts, spaced 14 inches on center. For tying fabric to rails and braces, use 9 gauge aluminum wire ties spaced 24 inches on center. For tying fabric to tension wire, use 11 gauge hog rings spaced 24 inches on center.

2.4 GATES

- A. Fabricate gate perimeter frames of 1.90 inches outside diameter tubular members galvanized in accordance with ASTM A120. Provide additional horizontal and vertical members to ensure proper gate operation and to allow for attachment of fabric, hardware, and accessories.
- B. Assemble gate frames by welding or fittings and rivets for rigid connections. Use same fabric as for fence, unless otherwise indicated. Install fabric with stretcher bars at vertical edges, and tie at top and bottom edges. Attach stretcher bars to gate frame at not more than 15 inches on center. Attach hardware with

rivets or by other means that will provide security against removal or breakage.

- C. Provide diagonal cross bracing that consists of 3/8 inch diameter adjustable length truss rods on gates where necessary to provide frame rigidity without sag or twist.
- D. Gate Hardware: Provide the following hardware and accessories, with a heavy galvanized finish, for each gate:
 - 1. Hinges: pressed steel or malleable iron to suit gate size, nonlift-off type, offset to permit 180 degrees gate opening. Provide one pair of hinges for each leaf.
 - 2. Latch: forked type or plunger bar type to permit operation from either side of the gate. Provide padlock eye as an integral part of the latch.
 - 3. Keeper: Provide a keeper for all vehicle gates that automatically engages the gate leaf and holds it in the open position until manually released.
 - 4. Double Gates: Provide gate stops for all double gates consisting of mushroom type or flush plate with anchors. Set in concrete to engage the center drop rod or plunger bar. Provide locking device and padlock eyes as an integral part of the latch, with one padlock for locking both gate leaves.

PART 3 EXECUTION

3.1 The packing for all products shall be Level C.

3.2 SET ALL POSTS IN A 3,000 PSI CONCRETE FOOTING. Trowel smooth the top of each footing at a 20 degrees angle from the post to the surrounding ground so as to shed water away from the post. The post shall extend to the full depth of the footing. The diameter and depth of footings for various fence heights shall be as specified on the Drawings.

3.3 INSTALL ALL FENCING TO THE LIMITS SHOWN ON THE DRAWINGS. Install end or corner posts at any break in the alignment greater than 20 degrees. Install intermediate posts between end or corner posts, spaced equally at a maximum of 10 feet center to center. Install end, corner, or gate posts on both sides of a gate. Only one end or corner post shall be installed at the junction of different heights of fence and shall be consistent with the largest post required at the junction. Install gates to allow a clear and level swing in either direction to their maximum limit. Set all posts with a vertical tolerance of less than 1 inch in 10 feet as measured with a plumb bob.

3.4 All corner, terminal, and gate posts for fence 6 feet and higher shall have a midrail and 3/8 round adjustable truss rod to the next post.

3.5 All gates shall have a full wraparound hinge system with a positive latch with provision for a padlock. Gates 5 feet and under shall have a self-closing mechanism.

3.6 All fence shall have a bottom tension wire attached to the fabric and posts.

END OF SECTION

SECTION 02485

SEEDING

PART 1 GENERAL

1.1 This work shall be performed in all disturbed areas not receiving such site improvements as buildings, roads, walks, sod, planting, etc., and shall include, but not necessarily be limited to, all seed bed preparation; the supplying and placing of soil additives, seed, and mulch wherever required by the Drawings or directed by the A/E; and maintenance.

1.2 Unless otherwise approved in writing by the A/E, seeding operations shall be limited to the following planting periods:

- A. Spring - March 1 through May 30
- B. Fall - August 15 through October 31

1.3 Refer to other sections for items affecting seeding. Coordinate this work with that specified by other sections for timely execution.

1.4 Seeding all disturbed ground, not designated to be sodded, shall be considered incidental to the water line installation and no separate payment shall be made for this item.

PART 2 PRODUCTS

2.1 GRASS SEED: Kentucky 31 Fescue (*Festuca Elatior*) and annual rye meeting the requirements of the State Department of Agriculture and furnished in new bags or bags that are sound and not mended; no "below standard" seed accepted. Where lawns or fields have special grass, then replace in kind.

2.2 FERTILIZER: Commercially manufactured; Grade 10-10-10; furnished in standard containers that are clearly marked with the name, weight, and guaranteed analysis of the contents and that ensure proper protection in transportation and handling; and in compliance with all local, state, and federal fertilizer laws

2.3 AGRICULTURAL LIMESTONE: Containing a minimum of 85 percent calcium carbonate and magnesium carbonate combined, 85 percent of which passes a No. 10 mesh sieve

2.4 MULCH: Stalks of rye, oats, wheat, or other approved grain crops properly cured prior to baling, air dried, and reasonably free of noxious weeds and weed seeds or other material detrimental to plant growth

PART 3 EXECUTION

3.1 Perform all seeding and related work as a continuous operation. Sow seed as soon as the seed bed has been prepared, and perform subsequent work in a continuous manner.

3.2 Before beginning seeding operations in any area, complete the placing of topsoil and final grading, and have the work approved by the A/E.

3.3 Scarify, disk, harrow, rake, or otherwise work each area to be seeded until the soil has been loosened and pulverized to a depth of not less than 2 inches. Perform this work only when the soil is in a tillable and workable condition.

3.4 Apply fertilizer and agricultural limestone uniformly over the seed bed, and lightly harrow, rake, or otherwise incorporate them into the soil for a depth of approximately 1 inch at the following rates:

A. Fertilizer: 15 pounds per 1,000 square feet

B. Agricultural Limestone: 40 pounds per 1,000 square feet

3.5 Sow seed uniformly with a rotary seeder, wheelbarrow seeder, or hydraulic equipment or by other satisfactory means.

3.6 The seeding rate shall be 5 pounds per 1,000 square feet for Kentucky 31 Fescue (*Festuca Elatior*).

3.7 When seeding during March 1 through April 1 and October 1 through November 20, add an additional 3 pounds per 1,000 square feet of annual rye grass.

3.8 Perform no seeding during windy weather or when the ground surface is frozen, wet, or otherwise untillable.

3.9 When seeding with mulch is specified, spread the mulch material evenly over the seeded areas immediately following the seeding operation.

A. Mulch Rate: 2 bales (100 pound minimum) per 1,000 square feet

3.10 The mulch rate may be varied by the A/E, depending on the texture and condition of the mulch material and the characteristics of the area seeded. Cover all portions of the seeded areas with a uniform layer of mulch so that approximately 25 percent of the ground is visible.

3.11 No equipment, material storage, construction traffic, etc., will be permitted on newly seeded ground.

3.12 Dispose of all surplus materials as directed by the Owner.

4. INSPECTIONS

The A/E shall inspect the seeding within 60 days after planting and determine if it is acceptable.

5. GUARANTEE

5.1 Secure an acceptable growth of grass in all areas designated for seeding, and maintain these areas for 1 full growing season.

5.2 An area is considered acceptable if it is represented by a minimum of 100 seedlings per square foot of the permanent species of grass representative of the seed mixture. If an acceptable growth is not obtained on the first planting, reseeding and remulching will be required.

5.3 If the planting is less than 50 percent successful, rework the ground, refertilize, reseed, and remulch.

END OF SECTION

SECTION 02486

SODDING

PART 1 GENERAL

1.1 This work shall include all soil preparation and the storage, transportation, placing, and maintenance of sod at all locations shown on the Drawings or as directed by the A/E.

1.2 Temporary storage of sod is permitted; however, take care to maintain the sod in a live, growing condition. Sod shall be rejected if it is permitted to decay or dry out to the extent that, in the judgment of the A/E, its survival is doubtful. Dispose of rejected sod as directed by the A/E at no expense to the Owner.

1.3 Set sod between October 1 and April 1 when the soil is in a workable condition.

1.4 Do not set sod out of season unless soil conditions are favorable and written permission is obtained from the A/E.

1.5 Refer to other sections for items affecting sodding. Coordinate this work with that specified by other sections for timely execution. The Contractor shall be wholly responsible for the scheduling, ordering, receiving, storing, and installing of all sodding materials.

1.6 Areas to be sodded shall be indicated on the Drawings and payment shall be made by the square feet of sod installed.

PART 2 PRODUCTS

2.1 SOD: Kentucky 31 Fescue (*Festuca Elatior*); new sod consisting of live, dense, well rooted growth; well suited for the intended purpose and soil conditions; completely free of noxious weeds and grasses (Bermuda grass, quack grass, Johnson grass, Canada thistle); and containing less than 5 plants of objectionable weeds per 100 square feet if nursery grown or 10 such plants if field grown

2.2 FERTILIZER: Commercially manufactured, Grade 10-10-10; furnished in standard containers that are clearly marked with the name, weight, and guaranteed analysis of the contents and that ensure proper protection in transportation and handling; and in compliance with all local, state, and federal fertilizer laws

2.3 AGRICULTURAL LIMESTONE: Containing a minimum of 85 percent calcium carbonate and magnesium carbonate combined, 85 percent of which passes a No. 10 mesh sieve

PART 3 EXECUTION

3.1 Before beginning sodding operations in any area, complete the placing of topsoil and final grading, and have the work approved by the A/E.

3.2 Scarify each area to be sodded a minimum of 2 inches.

3.3 Apply fertilizer and agricultural limestone uniformly over the sod bed at the rates shown below. Immediately prior to placing sod, water the sod bed until it is saturated to a depth of 1 inch, and keep it moist until the sod is placed.

A. Fertilizer: 40 pounds per 1,000 square feet of 10-10-10

B. Agricultural Limestone: 80 pounds per 1,000 square feet

3.4 Place sod as soon as practical after its removal from point of origin. Keep it moist while displaced.

3.5 Place sod by hand so that the edges are in close contact and in a position to break joints with the long dimension perpendicular to the slope. Fit and pound the sod into place with a 10 inches x 10 inches wood tamp or other similar implements.

3.6 Immediately after placing the sod, thoroughly wet and roll it.

3.7 Two weeks after the sod is installed, top dress and thoroughly water it. Top dressing shall consist of the following:

A. 1/2 to 1 pound: 38 percent urea formaldehyde per 1,000 square feet

B. 20 pounds: 6-12-12 per 1,000 square feet

3.8 No equipment, material storage, construction traffic, etc., will be permitted on newly sodded areas.

3.9 Dispose of all surplus material as directed by the Owner.

3.10 The Owner will review the sod for acceptance 30 days after installation, at which time the maintenance period will begin as stated in these specifications.

4. INSPECTIONS

The A/E shall inspect the sod within 30 days after installation and determine if it is acceptable.

5. GUARANTEES

Establish an acceptable growth of the specified sod on all areas indicated on the Drawings or as directed by the A/E. An area is considered acceptable if the majority of each piece of sod is alive and healthy and generally free from weeds, insects, and disease.

END OF SECTION

SECTION 02575

PAVEMENT REPAIR

PART 1 GENERAL

1.1 The work specified by this section shall consist of repairing or replacing all damaged pavement, whether public or private. Dirt shoulders, roads, streets, drives, and walks are to be restored to their original condition as an incidental part of the installation of utilities. Repair damaged base on either side of a trench wherever necessary. Trim the oxidation surface to neat lines outside of the trench wall, and repave the entire area as specified below and as shown on the Drawings or on the standard drawings.

1.2 Both these specifications and the Drawings make reference to the current edition of the Standard Specifications of the Kentucky Transportation Cabinet Department of Highways (KTCDOH). Even though the weather limitations, construction methods, and materials specifications contained in the KTCDOH specifications may not be explicitly repeated in these specifications, they shall, wherever applicable to the work called for by this section, be considered as implied and therefore adhered to. However, the various subsections "Measurement and Payment" contained in the KTCDOH specifications shall not be considered applicable.

1.3 The repair of trenches in streets and roads, including shoulders, under the jurisdiction of KTCDOH shall be made in accordance with and under the direction of the City of Franklin and the A/E. Refer to other sections for work related to that covered by this section. Curb repair is detailed on the standard drawings.

PART 2 PRODUCTS

2.1 AGGREGATE BASE: Dense graded aggregate base (DGA); (KTCDOH specifications, Section 302)

2.2 ASPHALT PRIME COATS: Cutback asphalt, emulsion primer-L; (KTCDOH specifications, Section 407)

2.3 AGGREGATE SURFACING: Gradation Size No. 610 or 710 coarse aggregate (KTCDOH specification, Section 805, Subsection 805.14)

2.4 ASPHALT BASE: Class I (KTCDOH specifications, Sections 401, 402, and 403)

2.5 ASPHALT BINDER: Class I (KTCDOH specifications, Sections 401, 402, and 403)

2.6 ASPHALT TACK COATS: Grade SS-1, SS-1h, AE-60, RS-1, or CRS-1 (KTCDOH specifications, Section 407)

2.7 ASPHALT SURFACE: Class I-O (KTCDOH specifications, Sections 401, 402, and 403)

2.8 QUICK DRY PAVEMENT STRIPING PAINT: Type A (white) and Type B (yellow) (KTCDOH specifications, Section 842)

PART 3 EXECUTION

3.1 SUBGRADE

- A. The subgrade shall be prepared in accordance with KTCDOH specifications, Section 208.
- B. Before any base material is installed, compact the subgrade of the area to be paved to 95 percent of optimum density as determined by KM 64-511.

3.2 BASE

- A. Install an aggregate base of the type specified above in accordance with Section 302 of the KTCDOH specifications. The maximum compacted thickness of any 1 layer shall be 6 inches and the total thickness of the base shall be that indicated by the standard drawings or as shown on the plans.

3.3 SEAL COAT SURFACE: In accordance with KTCDOH specifications, Section 406, uniformly apply an asphalt seal coat of a cutback asphalt emulsion, Grad RS-1, RS-2, WFRS-2, CRS-1 or CRS-2 over the entire width of the area to be surfaced at a rate of 0.3 gallon per square yard (1.5 liters per square meter). Immediately after application, uniformly cover the entire area with Size 7 crushed stone chips at a rate of 12 pounds per square yard (6.5 kilograms per square meter).

3.4 ASPHALTIC BINDER

- A. Construct asphalt binder course in accordance with KTCDOH specifications, Sections 401, 402, and 403. Apply a prime coat of cutback asphalt emulsion primer-L, at a rate of 0.38 to 0.42 gallon per square yard (0.9 to 2.3 liters per square meter). Take care to prevent the bituminous material's splashing on exposed faces of curbs and gutters, walls, walks, trees, etc.; if such splashing does occur, remove it immediately. After the prime coat has been properly cured, apply an asphalt binder to the thickness shown on the standard drawings or the plans.
- B. Carefully place the material to avoid segregation of the mix. Broadcasting of the material will not be permitted. Remove any lumps that do not readily break down.

3.5 ASPHALT SURFACE: Construct asphalt surface course in accordance with KTCDOH specifications, Sections 401, 402, and 403. If the asphalt surface course is to be placed directly on the mineral aggregate base, place an asphalt prime coat as described above. If, however, the surface course is to be placed on a binder course, then apply an asphalt tack coat of the sort specified above under PRODUCTS at a rate of 0.05 to 0.10 gallon per square yard (0.2 liters per square meter). Take care to prevent the bituminous material's splashing on exposed faces of curbs, gutters, walls, walks, trees, etc.; if such splashing does occur, remove it immediately. After the prime or tack coat has been properly cured, apply the asphaltic concrete to the thickness shown on the Drawings or standard drawings. Apply the surface course as described above for the binder course.

3.6 SMOOTHNESS: The finished surfaces shall conform to the lines with grades that existed prior to construction. No deviations, variations, or irregularities exceeding 1/4 inch (6.35 mm) in any direction when tested with a 12 foot (3.6 meter) straightedge will be permitted in the finished work, nor will any depressions that will not drain. Correct all such defects.

3.7 SAMPLING AND TESTING

- A. Submit to the A/E test reports made by an independent testing laboratory on the dense graded aggregate, asphalt materials, and asphalt design mixes, and obtain his approval of these reports before starting paving operations.
- B. Tests shall be made on the completed elements of the pavement to ascertain the compacted thickness of the base and surface courses. If sections with deficient thicknesses are found, the full section for a reasonable distance on each side of the deficiency shall be refused. Remove and reinstall all such sections. Patch all test holes in connection with thickness tests.
- C. When making surface tests, furnish on man to mark all surface defects for corrections.

END OF SECTION

SECTION 02600

MANHOLES

PART 1 GENERAL

1.1 Manholes shall be precast or poured in place concrete with concentric cones except when a force main enters the sewer. At locations where high concentrations of sewer gases are expected, manholes made of fiberglass may be required.

1.2 The lift station wet well shall be precast or poured-in-place concrete.

1.3 Refer to other sections for items affecting manholes. Coordinate this work with that specified by other sections for timely execution.

PART 2 PRODUCTS

2.1 CONCRETE MASONRY: Reinforced or plain, meeting the applicable requirements of Section 03303, Concrete for Utility Lines.

2.2 CONCRETE ADJUSTING RING (FOR CASTING ADJUSTMENT): Precast concrete adjusting ring with minimum thickness of 2 inches.

2.3 MORTAR: Composed of 1 part portland cement and 2 parts sand (volumetric measure) thoroughly mixed in a tight box, with water added gradually and mixed continually until mortar has attained the proper consistency for use in brick masonry; prepared only in such quantities as needed for immediate use; mortar mixed for more than 30 minutes, retempered, or previously set will not be allowed.

2.4 GRAY IRON CASTINGS: Cast iron conforming to the requirements of Class 30, ASTM A48; made accurately to the required dimensions; sound, smooth, clean, and free from blisters and other defects; not plugged or otherwise treated to remedy defects; machined so that covers rest securely in the frames with no rocking and are in contact with frame flanges for the entire perimeter of the contact surfaces; thoroughly cleaned subsequent to machining and, before rusting begins, and with the actual weight in pounds stenciled or printed by the manufacturer on each casting in white paint. Castings shall be John Bouchard 1150 or Vulcan VLN 1312. Watertight castings shall be Vulcan V2150-3 or John Bouchard No. 1123.

2.5 PLASTIC GASKET FOR PRECAST MANHOLES: Preformed plastic gasket shall meet or exceed all requirements of FS SS-S-00210, 210-A, "Sealing Compound, Preformed Plastic for Pipe Joints," Type I, rope form. The sealing compound shall be produced from blends of refined hydrocarbon resins and plasticizing compounds reinforced

with inert mineral filler and shall contain no solvents, irritating fumes, or obnoxious odors. The compound shall not depend on oxidizing, evaporating, or chemical action for its adhesive or cohesive strength. It shall be supplied in extruded rope form of suitable cross section and in such sizes as to seal the joint space when the pipes are laid. The sealing compound shall be protected by a suitable removable 2 piece wrapper, which shall be designed so that half may be removed longitudinally without disturbing the other half in order to facilitate application of the sealing compound. The flexible plastic gasket shall also meet the requirements of the following table:

Composition	Test Method	Minimum	Maximum
Bitumen (Petroleum Plastic Content)	ASTM D4	50	70
Ash Inert Mineral Matter	AASHTO T111	30	50
Volatile Matter	ASTM D6	--	2.0

Property	Test Method	Minimum	Maximum
Specific Gravity at 77 degrees F	ASTM D71	1.20	1.30
Ductility at 77 degrees F (cm)	ASTM D113	5.0	-----
Softening Point	ASTM D36	320 degrees F	-----
Penetration 77 degrees F (150 gms) 5 sec.	ASTM D217	50	120

2.6 LADDER BARS: An aluminum alloy weighing 2.2 pounds or a minimum 3/8 inch diameter steel reinforcing rod encapsulated in polypropylene plastic. Width shall be 12 inches.

2.7 PRECAST MANHOLE COMPONENTS: Meeting the requirements of the standard drawings and ASTM C478. The manhole sidewall shall be of a length such that a minimum of 1 course and a maximum of 3 courses shall be placed on top of the unit to bring the casting to grade. A precast concrete adjusting ring may be used for this purpose, conforming to the height ranges specified for brick.

2.8 INTERIOR COATING: Apply coating prior to delivery to the project site. The coating shall be applied in accordance with the manufacturer's recommendations and shall be 300M by KOP-COAT at 20 mils DFT or 46H-413 HI-BUILD TNEM Tar by TNEMEC at 20 mils DFT. If the precast concrete manhole receives direct discharge from a pump station, the interior shall be coated with Xypex (Specification No. 11-B). Joints between barrels shall be filled with Xypex Concentrate in "Dry-Pac" form. A 2 coat ("concentrate" followed by "modified") system 1.25 - 1.5 lb/sq yd each coat shall be utilized.

2.9 MANHOLE CONNECTORS

- A. New Manholes: A resilient connector molded from a neoprene compound meeting the requirements set forth in ASTM C923. The connector shall be Kor-N-Seal I with toggle Korband expander, PSX Series Six, or Press-Boot with adjustable glass fiber reinforced nylon internal expansion sleeve by Press-Seal Gasket Corporation.
- B. Existing Manholes: When connections are required on existing manholes, the manhole shall be cored and a resilient connector as specified for new manholes shall be used. If the material of the existing manhole is such that a clean core cannot be made, then a waterstop gasket of polyisoprene compound that meets or exceeds the requirements of ASTM C 443, with stainless steel take-up clamps may be used with the prior approval of the Engineer. The gasket shall be Style WS-25 (1-1/2 inches to 6 inches) and WS-30 (for 8 inches and larger) manufactured by Press Seal Gasket Corp., or equal.

2.10 MATERIAL TESTING: All precast reinforced concrete manhole risers and tops specified herein shall be tested and inspected by a commercial testing laboratory approved by the A/E prior to delivery to the site, and all materials that fail to conform to these specifications shall be rejected. After delivery to the site, any materials that have been damaged in transit or are otherwise unsuitable for use in the work shall be rejected and removed from the site. Supply certified copies in duplicate of the inspection and acceptance reports of the testing laboratory to the A/E before using the materials. The commercial testing laboratory shall be engaged and paid for by the Contractor. Submit a certificate from the manufacturer of the castings indicating that they meet all applicable requirements of these specifications.

2.11 FIBERGLASS MANHOLES

- A. Fiberglass reinforced polyester manholes shall be manufactured from commercial grade polyester resin or other suitable polyester or vinyl ester resins, with fiberglass reinforcements. Manholes shall be a one piece unit as manufactured by L. F. Manufacturing, Inc., or an approved equal.
- B. The resins used shall be a commercial grade unsaturated polyester resin.
- C. The reinforcing materials shall be commercial Grade "E" type glass in the form of mat, continuous roving, chopped roving, roving fabric, or a combination of the above, having a coupling agent that will provide a suitable bond between the glass reinforcement and the resin.

- D. Reinforcing materials used on the surface exposed to the contained substance shall be a commercial grade chemical-resistant glass that will provide a suitable bond with the resin and leave a resin rich surface.
- E. Fillers, when used, shall be inert to the environment and wetwell construction. Additives, such as thixotropic agents, catalysts, promoters, etc., may be added as required by the specific manufacturing process to be used. The resulting reinforced plastic material must meet the requirement of this specification.
- F. Fabrication: The exterior surface shall be relatively smooth with no sharp projections. Hand-work finish is acceptable if enough resin is present to eliminate fiber show. The exterior surface shall be free of blisters larger than 1/2 inch in diameter, delamination and fiber show.
- G. The interior surface shall be resin rich with no exposed fibers. The surface shall be free of crazing, delamination, blisters larger than 1/2 inch in diameter, and wrinkles of 1/8 inch or greater in depth. Surface pits shall be permitted up to 6 square feet if they are less than 3/4 inch in diameter and less than 1/16 inch deep.
- H. The following defects will not be permitted:
1. Exposed Fibers: Glass fibers not wet out with resin.
 2. Resin Runs: Runs of resin and sand on the surface.
 3. Dry Areas: Areas with glass not wet out with resin.
 4. Delamination: Separation in the laminate.
 5. Blisters: Light colored areas larger than 1/2 inch in diameter.
 6. Crazing: Cracks caused by sharp objects.
 7. Pits or Voids: Air pockets.
 8. Wrinkles: Smooth irregularities in the surface.
 9. Sharp Projection: Filter or resin projections necessitating gloves for handling.
- I. Physical Requirement: Lead rating. The complete manhole shall have a minimum dynamic-load rating of 16,000 ft-lbs when tested in accordance with ASTM D 3753. To establish this rating, the complete wetwell shall not leak, crack, or suffer other damage when load tested to 40,000 ft-lbs and shall not deflect vertically downward more than 1/4 inch at the point of load application when loaded to 24,000 lbs.

J. The manhole cylinder shall have a minimum pipe-stiffness values shown in Table 1 when tested in accordance with ASTM D 3753.

Table 1
 Stiffness Requirements

<u>Length, Ft.</u>	<u>F/AY, psi</u>	
10 to 20	2.01	
21 to 30	3.02	
31 to 40	5.24	

	<u>Hoop Direction</u>	<u>Axial Direction</u>
Tensile Strength (psi)	18,000	5,000
Tensile Modulus (psi)	0.8×10^6	0.7×10^6
Flexural Strength (psi)	26,000	4,500
Flexural Modulus (psi) (no ribs - 48" & 60")	1.4×10^6	0.7×10^6

K. Testing shall be performed as specified in ASTM D 3753 latest edition, Section 8.

PART 3 EXECUTION

3.1 Dewater sufficiently to maintain the ground water level at or below the bottom of the manhole foundation prior to and during placement of the foundation.

3.2 Obtain an adequate foundation for all manhole structures by removing and replacing unsuitable material with well graded granular material, by tightening with coarse rock, or by such other means as provided for foundation preparation of the connected sewers or as directed by the A/E. Wherever water is encountered at the site, place all cast-in-place bases on a 1-piece waterproof membrane to prevent any movement of water into the fresh concrete.

3.3 For precast manhole bases without bottoms, carefully block the base section above the prepared surface so that it is fully and uniformly supported in true alignment; make sure that all entering pipe can be inserted at proper grade. Then place the concrete foundation and invert under and upon this base section as shown in the Drawings.

3.4 Thoroughly wet and then completely fill all lift holes and all joints between precast elements with mortar. Smooth and paint them both inside and outside to ensure watertightness.

3.5 Construct poured in place concrete manholes and bases of 4,000 psi concrete in accordance with the provisions of this section and applicable provisions of Section 03303, Concrete for Utility Lines. The ladder bars shall be cast-in-place. The concrete design mix shall be submitted for approval.

3.6 Carefully set the cast iron frame for the cover at the required elevation, and properly bond it to the masonry with cement with preformed plastic gasket and/or anchor bolts. Wherever manholes are constructed in paved areas, tilt the top surface of the frame and cover so as to conform to the exact slope, crown, and grade of the existing adjacent pavement.

3.7 Manhole inverts shall be constructed of concrete to the approximate cross section of the sewers connected to them. Make any necessary changes in cross sections gradually from side to side of the manhole; make changes in direction of flow of the sewers to a true curve of as large a radius as is permitted by the size of the manhole.

3.8 All connections of PVC pipe to new manhole sidewalls shall be made with resilient connectors. Openings in the manhole sidewall for the pipe shall be precast or cored to provide required size and location. The hole shall be manufactured to allow for lateral and vertical movement, as well as angular adjustments through 20 degrees. The resilient connector shall be molded from a neoprene compound meeting requirements set forth in ASTM C-443. An external band made entirely of corrosion resistant stainless steel shall be used to effect the seal around the pipe. The internal band may be stainless steel or glass fiber reinforced nylon.

3.9 The void between the pipe and the connector shall be filled with an approved material.

3.10 Where the difference in the invert elevation of 2 or more sewers intersecting in 1 manhole is 24 inches or more, construct a drop manhole. Drop manholes shall be similar in construction to standard manholes except that a drop connection of pipe and fittings of the proper sizes and materials shall be constructed outside the manhole and supported by 3,000 psi concrete as indicated by Standard Drawing No. 110.

3.11 Place backfill by hand around the manhole and to a distance of at least 1 pipe length into each trench, and tamp with clean 1/2 inch to 3/4 inch sized crushed stone up to an elevation of 12 inches above the crown on all entering pipes. Continue backfilling in accordance with the requirements for trench backfilling.

3.12 All lifting holes and exterior joints shall be filled and pointed with non-shrink grout for concrete manholes.

- A. All manholes are to be tested immediately after assembly or construction and before backfilling. No standing water shall be allowed in the manhole excavation which may affect the accuracy of the test.
- B. All pipes and other openings into the manhole shall be suitably plugged in such a manner as to prevent displacement of the plugs while the vacuum is pulled. Service lines at manholes may be vacuum tested in lieu of air testing at the option of the Contractor.
- C. The Contractor is required to furnish all equipment necessary for these tests including the manhole sealing apparatus, gauges, pump plugs, and personnel shall be in accordance with equipment specifications and instructions provided by the manufacturer.
- D. The test head shall be placed in the cone section of the manhole.
- E. A vacuum of 10 inches of mercury shall be drawn. The time for the vacuum to drop to 9 inches of mercury shall be recorded.
- F. Acceptance for 4 foot diameter manholes shall be defined as when the time to drop to 9 inches of mercury meets or exceeds the following:

<u>Manhole Depth</u>	<u>Diameter</u>	<u>Time to Drop 1 Inch HG</u>
10 ft. or less	4 ft.	75 seconds
10 ft. to 15 ft.	4 ft.	90 seconds
15 ft. to 25 ft.	4 ft.	105 seconds

- G. For manholes 5 feet in diameter, add an additional 15 seconds and for manholes 6 feet in diameter, add an additional 30 seconds to the time requirements for 4 foot diameter manholes.
- H. If the manhole fails the test, necessary repairs shall be made and the vacuum test repeated until the manhole passes the test.
- I. If the manhole joint mastic or gasket is displaced during the vacuum test, the manhole shall be disassembled and the seal replaced.
- J. A second vacuum test will be required after the manhole casting has been set and the binder placed around it.

K.. Regardless of the outcome of the vacuum tests, any visual or audio defects are to be repaired.

END OF SECTION

SECTION 02642

PRESSURE SEWER VALVES

PART 1 GENERAL

1.1 Refer to other sections, Pressure Service Assemblies, Section 02719 and Common Excavation for Utilities, Section 02222, for related work specified, furnished or installed under this heading.

PART 2 PRODUCTS

2.1 BALL VALVES (PVC; 4 INCH OR SMALLER)

A. Valves on PVC sewage force main 1-1/2 inches through 3 inches shall be a true union PVC ball type. Working pressure at 70 degrees F shall be 150 pounds per square inch. Valves shall be supplied with O-ring seals and shall open to the left. The valve shall be as manufactured by Asaki/America, GF Plastic System, Inc., Hayward Manufacturing Company, Inc., or Nibco Chemtrol TU Series.

2.2 VALVE BOXES (FOR 4 INCH OR SMALLER PVC VALVES)

A. Boxes shall be of concrete with a solid one piece cast iron cover as manufactured by Southern Meter Box or of polymer concrete and fiber reinforced polyester as manufactured by CDR. The boxes shall be heavy duty suitable for traffic and of the approximately size and depth as shown on the standard drawing. A minimum 2-1/2 inch diameter 16 gauge steel reflector shall be applied to the underside of the fiber cover for electronic detection.

2.3 RESILIENT SEATED GATE VALVES (LARGER THAN 4 INCH)

- A. Valves on force mains larger than 4 inch diameter may be specified as resilient seated gate valves, manufactured to meet or exceed the requirements of AWWA C509 of latest revision and in accordance with the following specifications and shall be manufactured by Mueller, American-Darling, M&H, Clow, or U.S. Pipe.
- B. Valves shall have an unobstructed waterway not less than the full nominal diameter of the valve.

- C. The valves shall be nonrising stem with the stem made of cast, forged, or rolled bronze. Two stem seals of the O-ring type shall be provided to prevent leakage around the stem.
- D. The stem nut, made of bronze, may be independent of the gate or cast integrally with the gate. If the stem nut is cast integrally, the threads shall be straight and true with the axis of the stem to avoid binding during the opening or closing cycle.
- E. The sealing mechanism shall consist of a cast iron gate having a vulcanized synthetic rubber coating or a rubber seat mechanically retained on the gate. The resilient sealing mechanism shall provide zero leakage at 200 psi working pressure when installed with the line flow in either direction.
- F. The valve body, bonnet, and bonnet cover shall be ductile iron in accordance with ASTM A536.
- G. All valves shall be tested in strict accordance with AWWA C509.
- H. Buried valves shall have integrally cast mechanical joint ends in accordance with AWWA C111 and 2 inch square wrench nut operators. Mechanical joint accessories shall be supplied by the valve manufacturer. Exposed valves in structures shall have flanged ends and removable handwheel operators. The direction of opening for either type of valve shall be counterclockwise as viewed from the top.
- I. All ferrous surfaces of the valve body, both inside and outside, shall be protected by a fusion-bonded epoxy coating.
- J. Markings shall be cast on the bonnet or body of each valve to identify the size, direction arrow of opening working water pressure, year of manufacture and manufacturer of the valve.

2.4 STAINLESS STEEL KNIFE GATE VALVES

- A. Knife gate valves shall be specifically designed for on-off and throttling wastewater applications. Unless specified otherwise on the Drawings, the seats shall be metal instead of resilient seated. When fully open, the full pipe diameter shall be unobstructed.
- B. Body and gate shall be 316 or 317 stainless steel, packing gland and bolts.

- C. Approved manufacturers include DeZurik, Mueller, and Pratt.

2.5 ECCENTRIC PLUG VALVES AND OPERATORS

- A. Plug valves shall be of the nonlubricated eccentric type unless otherwise noted or shown on the Drawings, have resilient faced plugs, and be furnished with end connections as shown on the Drawings. Flanged valves shall be faced and drilled to the ANSI 125 pound standard. Mechanical joint ends shall conform to AWWA C111. Screwed ends shall meet NPT standards.
- B. Port areas for valves 20 inches and smaller shall be at least 80 percent of the full pipe area. Port areas of valves 24 inches through 48 inches shall be 100 percent of the full pipe area.
- C. Valve bodies and plug shall be of ASTM A126, Class B cast iron. All exposed nuts, bolts, springs, washers, etc., shall be zinc plated. Resilient plug facings shall be of EPT. Plug shall be of one-piece construction.
- D. Valves shall be furnished with permanently lubricated stainless steel upper and lower plug stem bushings. These bearings shall comply with AWWA C507, Section 8, paragraphs 8.1, 8.3, and 8.5, and with AWWA C504, Section 10.
- E. Valve shaft seals shall be adjustable and shall comply with AWWA C504, Section 10, and AWWA C507, Section 10.
- F. Valve pressure ratings shall be established by hydrostatic tests as specified by ANSI B16.1 and shall be as follows: 175 psi for valves through 12 inches and 150 psi for valves in sizes 14 inches through 36 inches.
- G. Manual valves shall have lever or gear actuators and tee wrenches, extension stems, floor stands, etc., as indicated on the Drawings. Unless otherwise shown or noted, all plug valves 8 inches and larger shall be equipped with gear actuators. All gearing shall be enclosed in a semisteel housing and shall be suitable for running in a lubricant with seals provided on all shafts to prevent the entry of dirt and water into the actuator. The actuator shaft and the quadrant shall be supported on permanently lubricated bronze bearings. Actuators shall clearly indicate the valve position, and an adjustable stop shall be provided to set closing torque. All exposed nuts, bolts, and washers shall be zinc plated. Valve packing adjustment shall be accessible without disassembly of the actuator.

- H. Valves and gear actuators for submerged service shall have seals on all shafts and gaskets on the valve and actuator covers to prevent entry of water. Actuator mounting brackets for buried or submerged service shall be totally enclosed and shall have gasket seals. All exposed nuts, bolts, springs, and washers shall be of stainless steel. All gear actuators shall be capable of accepting the input torque requirements set forth in AWWA C504.

2.6 VALVE BOXES (GATE VALVES)

- A. All valve box castings shall be made accurately to the required dimensions, and shall be sound, smooth, clean and free from blisters and other defects. Defective castings which have been plugged or otherwise treated to remedy defects shall be rejected. Contact surfaces of frames and covers shall be machined so that the covers rest securely in the frames with no rocking and with the cover in contact with the frames for the entire perimeter of the contact surface. All castings shall be thoroughly cleaned and subsequent to machining and before rusting begins, painted with a bituminous coating so as to present a smooth finish, tough and tenacious when cold, but not tacky with no tendency to scale. Install valve boxes on each proposed valve in accordance with the details shown on Standard Drawing No. C203.

2.7 AIR RELEASE VALVES AND COMBINATION AIR RELEASE VALVE

- A. Air release valves for low pressure grinder sewage force mains shall be similar and equal to APCO Model 200A Sewage Valve, Crispin Type P Sewage Valve, complete with 2 inch shut off valve, all in accordance with the Drawings. The combination air release valve shall be APCO No. 142C or Valmatic Model 201C. All floats shall be heavy stainless steel, hermetically sealed.
- B. Air release valves for other sewage force mains shall be APCO 400 Sewage Valve or equal. Combination valves to be similar except valve to be APCO 445 Combination Sewage Valve. All floats to be stainless steel, hermetically sealed. Backflushing accessories to be furnished for all valves.

PART 3 EXECUTION

3.1 LOCATION OF VALVES

- A. Valves in sewage force mains shall be located where shown on the Drawings.

3.2 VALVE BOXES AND VALVE PITS

- A. A valve box shall be provided for every valve and/or cleanout.
- B. The valve box shall not transmit shock or stress to the valve or pipe and shall be centered and plumb over the wrench nut of the valve or cleanout, set the box cover flush with the surface of the finish pavement, or approximately 1/2 inches above the ground surface or such other level as may be directed.

END OF SECTION

SECTION 02719

PRESSURE SERVICE ASSEMBLIES

PART 1 GENERAL

1.1 This section covers all service pipe and connections to the sewage force main.

1.2 Furnish all materials and equipment and install the service pipe and connections to the sewage force main at the locations shown on the Drawings.

1.3 The Contractor shall be responsible for safely storing materials needed for the work that have been accepted by him until they have been incorporated into the completed project. Keep the interiors of all pipes, fittings, and other accessories free from dirt and foreign matter at all times.

1.4 Each service line shall include a check valve for installation in the discharge line between the grinder pump and the sewer force main to ensure maximum protection against backflow in the event of sewer service line break.

PART 2 PRODUCTS

2.1 REDUNDANT VALVES

A. Ball Valve: The valve on the service line at the connection to the main shall be a PVC ball valve of true union design with permanently lubricated Teflon seats and elastomer "O"-ring seals and shall open to the left. The valves are to open and close with a quarter turn. Working pressure at 70 degrees F shall be 150 pounds per square inch. The valve shall be as manufactured by Asaki/America, GF Plastic System, Inc., Hayward Manufacturing Co., Inc., or Nibco Chemtrol. The valve shall be made of PVC with hub and socket compatible with 1-1/4 inch PVC solvent weld system. Dimensions for hub and socket shall be in accordance with Commercial Standards C5-272-65.

B. Check Valve: The valve shall be a true union ball check valve as manufactured by Asaki/America or Nibco Chemtrol.

2.2 SERVICE PIPE: Service pipe shall be 1-1/4 or 1-1/2 inches, SDR-21, Class 200 PVC pressure pipe made from Type 1, Grade 1, Polyvinyl chloride plastic as defined in ASTM D1784, "Specifications for Project Poly (vinyl chloride) Compounds." The

joints shall be of the solvent welded type and suitable for the pressure required of the pipe. Schedule 40 PVC is also acceptable.

2.3 VALVE BOXES

- A. Boxes shall be of concrete with a solid one piece cast iron cover as manufactured by Southern Meter Box or of polymer concrete and fiber reinforced polyester as manufactured by CDR. The boxes shall be heavy duty suitable for traffic and of the approximate size and depth as shown on the standard drawing. A minimum 2-1/2 inch diameter 16 gauge steel reflector shall be applied to the underside of the fiber cover for electronic detection.

PART 3 EXECUTION

3.1 The service line shall have a minimum of 18 inches cover.

3.2 All service lines shall be tested at 100 psi for a 30 minute period separately from the sewage force main. There will be no leakage allowed on the service lines from inside the pump basin to the redundant valve.

END OF SECTION

SECTION 02722

SANITARY SEWERS (GRAVITY)

PART 1 GENERAL

1.1 Furnish all material, equipment, tools, and labor in connection with the sewage lines, complete and in accordance with the Drawings and these specifications.

1.2 It shall be the Contractor's responsibility to ensure that all necessary materials are furnished to him and that those found to be defective in manufacture are replaced at no extra cost to the Owner. Materials damaged in handling after being delivered by the manufacturer shall be replaced at the Contractor's own expense. If installed material is found to be defective, the cost of both the material and labor needed to replace it shall not be passed on to the Owner.

1.3 The Contractor shall be responsible for safely storing materials needed for the work that have been accepted by him until they have been incorporated into the completed project. Keep the interiors of all pipes, fittings, and other accessories free from dirt and foreign matter at all times.

1.4 Refer to other sections for work related to that specified by this section. Coordinate this work with that required by other sections for timely execution.

1.5 Pipe material for sewer lines 18 inches and smaller shall be PVC unless otherwise shown on the Drawings. Ductile iron pipe shall be used only when so indicated on the Drawings.

1.6 For PVC and ductile iron pipe, furnish a certificate from the pipe manufacturer indicating that the pipe meets all applicable requirements of these specifications.

PART 2 PRODUCTS

2.1 PIPE

A. Polyvinyl Chloride (PVC): To meet and/or exceed the requirements of ASTM D3034, SDR 35; suitable for use as a gravity sewer conduit with provisions for contraction and expansion at each joint; with a rubber ring and standard lengths of 12.5 feet plus or minus 1 inch; designed to pass all tests at 73 degrees F (plus or minus 3 degrees F); 6 inches long sections of pipe to be subjected to impact from a free falling type (20 pounds, Type A) in accordance with ASTM D2444 with no evident splitting or shattering (denting not considered a

failure); and with a minimum envelope of 6 inches of granular material around the pipe, but with all other bedding and backfilling requirements remaining the same as for other pipe material. PVC pipe shall be manufactured by H&W, Vulcan, Hawk, Columbia Plastic, or approved equal.

1. The minimum pipe stiffness for PVC pipe at 5 percent deflection shall be 46 for all sizes when tested in accordance with ASTM D2412; external loading properties of plastic pipe shall be by parallel plate loading.
2. A specimen of PVC pipe 6 inches long shall be flattened between parallel plates in a suitable press until the distance between the plates is 40 percent of the outside diameter of the pipe. The rate of loading shall be uniform and such that the compression is complete in 2 to 5 minutes.
3. After being immersed for 2 hours in a sealed container of anhydrous acetone (99.5 percent pure), a sample ring of PVC pipe shall show no visible spalling or cracking when tested in accordance with ASTM D2152 (swelling or softening is not considered a failure).

B. Ductile Iron

1. Ductile iron pipe shall conform to the requirements of ANSI 21.51/AWWA C151 for ductile iron pipe centrifugally cast in metal or sand-lined molds. It shall be made and tested in accordance with ASTM A536 and be subjected to and able to withstand a hydrostatic pressure of 500 psi.
2. Ductile iron sewer pipe shall be lined with enameline as specified in ANSI A21.4/AWWA C104. In addition, a bituminous seal coat or asphalt emulsion spray coat approximately 1 mil thick shall be applied to the lining in accordance with the pipe manufacturer's standard practices, push-on joints shall be either "Fastite" (by American Cast Iron Pipe Company), "Tyton" (by U.S. Pipe and Foundry Company), "Super Bell-Tite" (by McWane or Griffin), conforming to ASTM A746 and having a wall thickness of Pressure Class 350 unless determined otherwise by the City of Franklin.

2.2 JOINTS AND JOINTING MATERIALS

- A. Polyvinyl Chloride (PVC) Pipe Joints: bell and spigot type with a rubber ring suitable to meet all test requirements of these specifications.

- B. Ductile Iron Pipe Joints: gasket type joints for bell and spigot ductile iron pipe designed to meet the infiltration requirements of these specifications; jointing to comply with the applicable provisions of ANSI A21.11
- C. PVC sewer fittings shall conform to the requirements of ASTM D 3034 specification, latest edition. Fittings in sizes through 8 inches shall be molded in one piece with elastomeric joints and minimum socket depths as specified in sections 6.2 and 7.3.2. Gaskets for elastomeric joints shall be molded with a minimum cross sectional area of 0.20 sq. in. and conform to ASTM F 477 specification. Fittings 10 inches and larger shall be molded or fabricated in accordance with section 7.11 with manufacturers standard pipe bells and gaskets. Wall thickness of fittings shall be SDR 35 as defined in section 7.4.1 of the specification. Fittings shall be as manufactured by Harco or approved equal. Service line caps are to be Fenco "Quick" cap or Harco.

PART 3 EXECUTION

3.1 PIPE LAYING

- A. Lay no pipe except in the presence of a City of Franklin Representative.
- B. Before placing sewer pipe in position in the trench, carefully prepare the bottom and sides of the trench, and install any necessary bracing and sheeting as provided in Section 02222, Unclassified Excavation for Utilities.
- C. Wherever necessary to provide satisfactory bearing surface, place concrete cradles as shown on the Drawings or as directed by the A/E. Cradles shall be of concrete and conform to the dimensions shown on the Drawings. Concrete placed outside the dimensions shown shall be at the Contractor's expense.
- D. Lasers must be used after the type and procedures are approved by the A/E. When lasers are used, set reference points for both line and grade at each manhole. Where grades are 0.6 percent or less, check the elevation of the beam each 100 feet with an offset point or engineer's level.
- E. Do not allow water to run or stand in the trench while pipe laying is in progress or before the trench has been backfilled. Do not at any time open up more trench than the available pumping facilities are able to dewater.

- F. Correct trench bottoms found to be unsuitable for foundations after pipe laying operations have started, bringing them to exact line and grade with compacted earth as necessary.
- G. Carefully inspect each piece of pipe and special fitting before it is placed, and lay no defective pipe in the trench. Pipe laying shall proceed upgrade, starting at the lower end of the grade and with the bells upgrade. When pipe laying is not in progress, keep the ends of the pipe tightly closed with an approved temporary plug.
- H. Bell holes shall be large enough to allow ample room for the pipe joints to be properly made. Cut out bell holes no more than 2 joints ahead of the pipe laying. Carefully grade the bottom of the trench between bell holes so that each pipe barrel rests on a solid foundation for its entire length. Lay each pipe joint so as to form a close concentric joint with adjoining pipe and to avoid any offsets or inequalities in the flow line.
- I. Before constructing or placing any joints, demonstrate to the A/E, by completing at least one sample joint, that the methods to be used conform to the specifications and will provide a watertight joint and further that the workmen to be involved in this phase of work are thoroughly familiar and experienced with the type of joint proposed.
- J. No other type of joint may be used unless authorized in writing by the A/E.
- K. Install tee branches in sewer lines to serve properly each lot facing or abutting on the street or alley in which sewer is being laid and at such other locations as may be designated by the A/E. In addition, for lines in easements, lay a minimum 5 feet section of service line, and for rights-of-way, lay the service line to the right-of-way. If tee branches are not to be used immediately, close them with a cap that are held in place to prevent infiltration and withstand all test requirements.
- L. For all tees that are plugged and laid in rock, blast a minimum of 6 LF of ditch line in the direction and to the approximate grade of the future lateral as directed by the A/E, but do not excavate the material. This shall be done at no extra cost to the Owner. Furnish the A/E with a record of the exact location of each tee installed.
- M. If the work consists of constructing a new sewer to replace an existing one, connect existing service lines to the new line.

- N. New service laterals shall conform to the standard drawings.
- O. As the work progresses, thoroughly clean the interior of the pipe in place. After each line of pipe has been laid, carefully inspect it, and remove all earth, trash, rags, and other foreign matter from its interior.
- P. After the joints have been completed, they shall be inspected before being covered. The pipe shall meet the test requirements for watertightness; immediately repair any leak or defect discovered at any time after completion of the work. Any pipe that has been disturbed after joints were formed shall be taken up, the joints cleaned and remade, and the pipe relaid at the Contractor's expense. Carefully protect all pipe in place from damage until backfilling operations are completed.
- Q. Do not begin the backfilling of trenches until the pipe in place has been inspected by the A/E.
- R. Lay sewers at least 10 feet horizontally from any existing or proposed water main. If this is not practical, the sewer may be laid closer than 10 feet to a water main provided it is laid in a separate trench and the elevation of the top of the sewer is at least 18 inches below the bottom of the water main.
- S. Where a sewer crosses under water mains, the top of the sewer shall be at least 18 inches below the bottom of the water main. If the elevation of the sewer cannot be varied to meet the above requirements, relocate the water main to provide this separation, or else reconstruct it with ductile iron pipe for a distance of 10 feet on each side of the sewer with a full joint of the water main centered over the sewer.
- T. If it is impossible to obtain proper horizontal and vertical separation as stipulated above, construct both the water main and the sewer of ductile iron pipe, and pressure test each at 150 psi. Either the water or the sewer line must be encased in watertight carrier pipe 10 feet on each side of the crossing.
- U. Perform boring by means of augering to the size, line, and grade shown on the Drawings. Jack the steel casing pipe into place as the boring proceeds. Weld sections of casing pipe together to provide a watertight joint.
- V. Make connections to all existing sewer lines as shown on the Drawings or as directed by the A/E. Make connections either by removing a section of the sewer from the

existing line and inserting a branch of the proper size or by constructing a manhole, junction box, regulator chamber, or other structure as shown on the Drawings.

- W. Join dissimilar pipe by using suitable compression couplings. If compression couplings are not available, make jointing with a special fabricated coupling approved by the A/E. Dissimilar pipe between manholes shall not generally be allowed except to meet specific conditions in this Section relating to water lines, trenching in engineered fill, and tying to existing systems.
- X. Provide concrete cap or ductile iron pipe as shown on the Drawings for pipe sewers that, when completed, have less than 2.5 feet of cover in nontraffic areas and 4 feet of cover in traffic areas. If such protection is not shown on the Drawings, place it in accordance with the typical section shown.
- Y. Carefully protect from damage all existing sewers, water lines, gas lines, sidewalks, curbs, gutters, pavements, electrical lines, and other utilities or structures in the vicinity of the work at all times. If it is necessary to repair, remove, and/or replace any such utility or structure in order to complete the work properly, do so in compliance with the provisions set forth in other section of these specifications. Any such work shall be considered incidental to the construction of pipe sewers.
- Z. Water service connections will be repaired or replaced by the Contractor at his expense as an incidental part of the work.
- AA. Service or house connections to existing sewers that are damaged or removed shall be repaired or replaced by the Contractor at his own expense as an incidental part of the work.
- BB. Ductile iron pipe shall be used in lieu of PVC when:
 - 1. Traversing more than 10 feet of engineered fill, and
 - 2. Deeper than 15 feet.

3.2 TESTING OF GRAVITY SEWERS

A. Visual Tests

- 1. Upon completion of the construction or earlier if the A/E deems advisable, the A/E will make a visual inspection of the sewer and construction site.

- Immediately repair all leaks and defects found by such inspection.
2. In addition to general cleanup and leakage, the following standards shall be used to determine failure or defects of this project.
 3. Sewers shall be built so as to remain true to line and grade. The inclining grade of the bottom of the sewer after completion shall be such that, after flooding, the flood water drains off so that no remaining puddle of water is deeper than 1/2 inch on pipe 36 inches internal diameter or smaller and 3/4 inch on pipe larger than 36 inches internal diameter. Any section of pipe that does not comply with the specifications at any time previous to one year after final acceptance of the work shall be replaced or relaid at the Contractor's expense.
 4. The Contractor will be held strictly responsible that all parts of the work bear the load of the backfill. If defects develop in the pipe within one year from the date of final acceptance of the work, the Contractor will be required to replace, at his expense, all such defective pipe. To this end, the Contractor is advised to purchase pipe under a guarantee from the manufacturer, guaranteeing proper service of sewer pipe under conditions established by the Drawings, specifications, and local conditioning at the site of the work.

B. Air Testing for Sewers

1. Perform low pressure air testing as follows:
 - a. Furnish all equipment, facilities, and personnel necessary to conduct the test. The test shall be observed by a representative of the Owner.
 - b. Make the air test after all services have been installed and at least 24 hours after backfilling has been completed and compacted.
 - c. Perform the first series of air tests after 1,000 LF but before 2,000 LF of sewer has been laid. The purpose of this first series of tests is to assure both the Contractor and the Owner that the materials and method of installation meet the intent of these specifications. If the total length of sewers for the project is less than 5,000 feet, this requirement may be waived by the Owner. Conduct the remainder of the tests after approximately each 10,000 LF has been laid.
 - d. Plug all tees and ends of sewer services with flexible joint caps securely fastened to

withstand the internal test pressures. Such caps shall be readily removable, and their removal shall provide a socket suitable for making a flexible jointed lateral connection or extension.

- e. Prior to testing, check the pipe to see that it is clean. If not, clean it by passing a full-gauge squeegee through the pipe. It shall be the Contractor's responsibility to have the pipe cleaned.
- f. Immediately following this check or cleaning, test the pipe installation with low pressure air. Supply the air slowly to the plugged pipe installation until the internal air pressure reaches 4.0 psi more than the average back pressure of any ground water that may submerge the pipe. Allow at least 2 minutes for temperature stabilization.
- g. The pipeline shall be considered acceptable when tested at an average pressure of 3.0 psi more than the average back pressure of any ground water that may submerge the pipe, if the section under test does not lose air at a rate greater than 0.0015 cfm per square foot of internal pipe surface area. The requirements of this specification shall be considered satisfied if the time required in seconds for the pressure to decrease from 3.5 to 2.5 psi more than the average back pressure of any ground water that may submerge the pipe is not less than that shown in the following table:

ALLOWABLE AIR LOSS VALUES PER 100 LF

<u>Pipe Size</u>	<u>Time in Seconds</u>
6 inches	42
8 inches	72
10 inches	90
12 inches	108
15 inches	126
18 inches	144
21 inches	180
24 inches	216

- h. If the pipe installation fails to meet these requirements, the Contractor shall determine at his own expense the source or sources of leakage and repair or replace all defective materials or workmanship. The completed pipe

- installation shall meet the requirements of this test before being considered acceptable.
2. The recommended procedures for conducting acceptance tests are as follows:
 - a. Clean pipe that is to be tested.
 - b. Plug all pipe outlets with suitable test plugs, and brace each plug securely.
 - c. Increase gauge pressure in the test by the amount of ground water pressure at the crown of the pipe.
 - d. Add air slowly to the portion of the pipe installation being tested until the internal air pressure is raised to 4.0 psi more than the average back pressure above the crown of the pipe.
 - e. After the above internal pressure is obtained, allow at least 2 minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure.
 - f. After 2 minutes, disconnect the air supply.
 - g. When pressure decreases to 3.5 psig either by leaking down or by bleeding down with a release valve, start the stopwatch, and determine the time in seconds that is required for the internal air pressure to reach 2.5 psig. Compare this time interval as calculated above. If the time is more than that calculated, the test shall be assumed to be acceptable.
 3. Plugs used to close the sewer pipe for the air test must be securely braced to prevent the unintentional release of the plug, which can become a high velocity projectile. Locate gauges, air piping manifolds, and valves at the top of the ground. No one shall be permitted to enter a manhole where a plugged pipe is under pressure. Four pounds air pressure (gauge) develops a force against the plug in a 12 inch pipe of approximately 450 pounds. Provide a safety release device set to release at 10 psi between the air supply and the sewer under test.
 4. Regardless of the outcome of the tests, repair any noticeable leak.

3.3 VISUAL INSPECTION OF MISCELLANEOUS MATERIALS: All material used on this project will be visually inspected by the A/E at the site for conformance to the required specifications. When reasonable doubt exists that said material meets the specifications, the A/E may require certified mill tests, samples, and/or tests by an independent laboratory or other suitable form of verification that the material meets the required specifications.

3.4 DEFLECTION TESTING: Test deflection of the pipe by passing 9-arm pin go/no-go mandrel sized to 95 percent of the inside pipe diameter of the actual pipe in place and covered. Make this acceptance test 30 days after backfill has been placed and upon the A/E's approval.

3.5 CLEANUP: After completing each section of the sewer line, remove all debris, construction materials, and equipment from the site of the work, grade and smooth over the surface on both sides of the line, and leave the entire right-of-way in a clean, neat, and serviceable condition.

END OF SECTION

SECTION 02724
SEWAGE FORCE MAIN

PART 1 GENERAL

1.1 Furnish all material, equipment, tools, and labor in connection with the sewage force main, complete and in accordance with the Drawings and these specifications. Pipe material shall be SDR-21 PVC.

1.2 It shall be the Contractor's responsibility to ensure that all necessary materials are furnished to him and that those found to be defective in manufacture are replaced at no extra cost to the Owner. Materials damaged in handling after being delivered by the manufacturer shall be replaced at the Contractor's own expense. If installed material is found to be defective before the final acceptance of the work, the cost of both the material and labor needed to replace it shall not be passed on to the Owner.

1.3 The Contractor shall be responsible for safely storing materials needed for the work that have been accepted by him until they have been incorporated into the completed project. Keep the interiors of all pipes, fittings, and other accessories free from dirt and foreign matter at all times.

1.4 Refer to other sections for work related to that specified by this section. Coordinate this work with that required by other sections for timely execution.

PART 2 PRODUCTS

2.1 DUCTILE IRON PIPE AND FITTINGS

- A. Ductile iron pipe shall conform to the requirements of ANSI 21.51/AWWA C151 for ductile iron pipe centrifugally cast in metal or sand-lined molds. It shall be made and tested in accordance with ASTM A536 and be subjected to and able to withstand a hydrostatic pressure of 500 psi.
- B. The pipe shall be plain and ductile iron pipe with push-on, single gasket joints. The design thickness shall be that specified by ANSI A21.50/AWWA C150 except that all pipe shall have a minimum wall thickness of Pressure Class 350.
- C. The length of each individual piece of ductile iron pipe shipped must be plainly marked on that piece of pipe.

- D. The push-on single gasket joints shall be either "Fastite" (by American Cast Iron Pipe Company), "Tyton" (by U.S. Pipe and Foundry Company), or "Super Bell-Tite" (by McWane or Griffin).
- E. The bell of each pipe shall have a tapered annular opening and a cast or machined retaining groove for the gasket. The gasket groove shall have a flared design so that maximum deflection will be provided. The plain spigot end of the pipe shall be beveled in order to simplify its entry into and centering within the bell and the compression of the gasket.
- F. The gasket shall be of high quality vulcanized rubber made in the form of a solid ring to exact dimensions. The design of the gasket groove in the bell of the pipe and the design, hardness, and other properties of the gasket itself shall be such that the joint is liquid tight for all pressures from a vacuum to the maximum internal liquid pressure of 350 psi.
- G. Enough lubricant shall be furnished with each order to provide for the proper installation of the pipe supplied with said order. This lubricant shall be shall be nontoxic, impart no taste or smell, and have no harmful effect on the rubber gasket. It shall have a consistency that will allow it to be easily applied to the pipe in either hot or cold weather and that will enable it to adhere to either wet or dry pipe.
- H. Standard and special fittings shall be ductile iron. Use standard mechanical joint fittings unless otherwise shown on the Drawings. All fittings shall conform to ANSI A21.53/AWWA C153, unless only ANSI A21.10/AWWA C110 sizes are available.
- I. Pipe and pipe fittings shall have cement linings as specified in ANSI A21.4/AWWA C104. In addition, a bituminous seal coat or asphalt emulsion spray coat approximately 1 mil thick shall be applied to the cement lining in accordance with the pipe manufacturer's standard practices.
- J. Centrifugally cast ductile iron pipe with one flange cast on and one flange screwed that otherwise meets the foregoing requirements shall be acceptable as flanged pipe. Flanged ductile iron pipe with threaded flange shall meet the requirements of ANSI A21.15/AWWA C115 and have a minimum wall thickness of Pressure Class 350.
- K. Flanged fittings and other specials shall be of ductile iron and shall be manufactured to ANSI A21.10/AWWA C110 specifications. The flanges of pipe, fittings, and

specials shall be drilled to standard 125 pound template, unless shown otherwise. Flanged pipe and all fittings shall be supplied with gaskets and bolts and, unless otherwise specified, be as manufactured by U.S. Pipe and Foundry Company, American Cast Iron Pipe Company, Clow Corporation, or equal.

- L. The pipe manufacturer is to furnish the A/E a certificate of inspection, sworn to by the factory inspector in the presence of a notary public, stating that the pieces of pipe in the shipment were made and tested in accordance with ANSI A21.51 and that they were subjected to and withstood a hydrostatic pressure of 500 psi. Each statement is to give the number of pieces of pipe in the shipment, the length of each piece to pipe, and the serial number of each piece of pipe making up the shipment. In addition, the weight of each individual piece of pipe making up the shipment is to be listed opposite the serial number of each pipe length and attached to the certificate of inspection.

2.2 PVC PIPE

- A. All plastic pipe shall be made from Class 12454-B polyvinyl chloride plastic (PVC 1120) as defined by ASTM D1784.
- B. All Class 200 pipe shall have NSF approval and be manufactured in accordance with ASTM D2241. The following tests shall be run for each machine on each size and type of pipe being produced, as specified below:
 - 1. Flattening Test: Once per shift in accordance with ASTM D2412. Upon completion of the test, the specimen shall not be split, cracked, or broken.
 - 2. Acetone Test (Extrusion Quality Test): Once per shift in accordance with ASTM D2152. There shall be no flaking, peeling, cracking, or visible deterioration on the inside or outside surface after completion of the tests.
 - 3. Quick Burst Test: Once per 24 hours in accordance with ASTM 1599.

SDR	Pressure Rating	Minimum Bursting Pressure, psi
21	200	800

- 4. Impact Tests: Once each 2 hours in accordance with ASTM D2444.
- 5. Wall Thickness and Outside Dimensions Tests: Once per hour in accordance with ASTM D2122.
- 6. Bell Dimensions Test: Once per hour in accordance with ASTM D2122.

- C. If any specimen fails to meet any of the abovementioned tests, all pipe of that size and type manufactured between the test periods must be scrapped and a full set of tests rerun.
- D. Furnish a certificate from the pipe manufacturer stating that he is fully competent to manufacture PVC pipe of uniform texture and strength and in full compliance with these specifications and further stating that he has manufactured such pipe and done so in sufficient quantities to be certain that it will meet all normal field conditions. In addition, the manufacturer's equipment and quality control facilities must be adequate to ensure that each extrusion of pipe is uniform in texture, dimensions, and strength. Also furnish a certificate from the manufacturer certifying that the pipe furnished for this project meets the requirements of these specifications and suitable for the use intended.
- E. All pipe shall be manufactured in the United States of America. All pipe for any one project shall be made by the same manufacturer.
- F. All pipe shall be furnished in the laying length of 20 feet. The Contractor's methods of storing and handling the pipe shall be approved by the A/E. All pipe shall be supported within 5 feet of each end; in between the end supports, there shall be additional supports at least every 15 feet. The pipe shall be stored away from heat or direct sunlight. The practice of stringing pipes out along the proposed line routes will not be allowed.
- G. Certain information shall be applied to each piece of pipe. At the least, this shall consist of:
1. Nominal size and outside diameter base
 2. Type of material
 3. DR and pressure class
 4. Manufacturer
 5. NSF Seal of Approval
- H. Pipe that fails to comply with the requirements set forth in these specifications shall be rejected.
- I. The spigot end of each pipe shall be beveled so that it can be easily inserted into the gasket joint, which in turn shall be designed so that the spigot end may move in the socket as the pipe expands or contracts. The spigot end shall be striped to indicate the distance into which it is to be inserted into the socket. Each joint shall be able to accommodate the thermal expansions and contractions experienced with a temperature shift of at least 75 degrees F.

- J. Enough lubricant shall be furnished with each order to provide a coat on the spigot end of each pipe. This lubricant shall be nontoxic, impart no taste or smell to the water, have no harmful effect on the gasket or pipe material, and support no bacterial growth. The lubricant containers shall be labeled with the manufacturer's name.
- K. Joints shall be manufactured in accordance with ASTM D2122 except that the thickness of the bell shall be, as a minimum, equal to that of the barrel. Joints shall be either integral bell and ring joints with rubber compression gaskets as manufactured by H&W, Vulcan, or Columbia Plastic. However, the pipe and bell must be made by the same manufacturer.
- L. Gaskets and lubricants intended for use with the PVC pipe shall be made from materials that are compatible with the plastic material and with each other when used together. Elastomeric gaskets shall be manufactured to conform with the requirements of ASTM F477.
- M. Standard and special fittings shall be ductile iron. Use the compact body type mechanical joint fittings. All fittings shall conform to the specifications of ANSI A21.53/AWWA C153 (latest edition) in all respects. The gaskets shall be suitable for use with the PVC pipe.
 - 1. Fittings shall be lined with a thin cement lining as specified in ANSI A21.4/AWWA C104; this lining is to be furnished at no extra cost. In addition, a bituminous seal coat or asphalt emulsion spray coat approximately 1 mil thick shall be applied to the cement lining in accordance with the pipe manufacturer's standard practices.
 - 2. Fittings shall be in accordance with the standard mechanical joint fittings manufactured by the U.S. Pipe and Foundry Company, American Cast Iron Pipe Company, Tyler, or Griffin.
- N. Detectable tape shall be 2 inches wide and shall be an inert, bonded layer plastic with a metallized foil core and shall be highly resistant to alkalis, acids, or other destructive chemical components likely to be encountered in soils. The tape shall be brightly colored to contrast with soil and shall bear the imprint "CAUTION SEWER LINE BURIED BELOW."

PART 3 EXECUTION

3.1 INSTALLATION OF FORCE MAIN

- A. Lay the force main to and keep it at the lines and grades required by the Drawings. All fittings shall be at the required locations, and spigots well centered in the bells. Where the grades are 0.2 percent or less, use a laser to maintain the required slopes.
- B. For force mains unless otherwise indicated by the Drawings, shall have at least 30 inches of cover. The pipe shall slope continuously between high and low points and have a minimum of 60 inches cover at the high points. No departure from this policy shall be made except by order of the A/E.
- C. Provide and use tools and facilities that are satisfactory to the A/E and that will allow the work to be done in a safe and convenient manner. Use a derrick, ropes, or other suitable equipment to lower all pipe and fittings into the trench one piece at a time. Carefully lower each piece so that neither it nor any protective coating or lining it may have will be damaged. Under no circumstances, drop or dump force main materials into the trench.
- D. Lower no pipes and fittings into the trench until they have been swabbed to remove any mud, debris, etc., that may have accumulated within them. After the pipe has been lowered, remove all unnecessary materials from it. Before any pipe is laid, brush and wipe clean the outside of its spigot end and the inside of its bell and ensure that the pipe is dry and oil-free.
- E. Take every precaution to keep foreign material from getting into the pipe while it is being placed in the line. If the crew laying the pipe cannot put it into the trench and in place without allowing earth to get inside it, then place a heavy, tightly woven canvas bag of suitable size over each end of the pipe and leave it there until it is time to connect that pipe to the one adjacent to it.
- F. Place no debris, tools, clothing, or other materials in the pipe during laying operations.
- G. After a length of pipe has been placed in the trench, center the spigot end in the bell of the adjacent pipe, and then insert to the depth specified by the manufacturer and bring to the correct line and grade. Secure the pipe in place by tamping an approved backfill material around it.

- H. Bell holes shall be big enough so that there is ample room for the pipe joints to be properly made. Between bell holes, carefully grade the bottom of the trench so that each pipe barrel will rest on a solid foundation for its entire length.
- I. Whenever pipe laying is not in progress, close the open ends of pipe in the trench with a watertight plug or by other means approved by the A/E. This shall be done not only at the end of each working day but also before work is stopped for lunch periods, bad weather, or any other reason. If there is water in a trench, this seal shall remain in place until the trench has been pumped completely dry.
- J. The cutting of pipe so that fittings or closure pieces can be inserted shall be done in a neat and workmanlike manner and without any damage to the pipe. Follow the manufacturer's recommendations concerning how to cut and machine the ends of the pipe in order to leave a smooth end at right angles to the pipe's axis.
- K. The flame cutting of pipe by means of an oxyacetylene torch will not be allowed.
- L. Unless otherwise directed by the A/E, lay pipe with the bell ends facing in the direction of laying.
- M. Wherever pipe must be deflected from a straight line (in either the vertical or horizontal plane) in order to avoid obstructions or plumb stems, or wherever long radius curves are permitted, the amount of deflection shall not exceed that necessary for the joint to be satisfactorily made, nor that recommended by the pipe manufacturer, and shall be approved by the A/E.
- N. Lay no pipe in water or when it is the A/E's opinion that trench conditions are unsuitable. If crushed stone is used to improve trench conditions or as backfill for bedding the pipe, this shall be considered incidental to the project, and no separate payment will be made for its use.
- O. Install thrust blocks wherever the force main changes direction (e.g., at tees and bends), at dead ends, or at any other point where the manufacturer recommends and/or the A/E indicates that they are to be used.
- P. Make all joints, whether standard mechanical, push-on, or flanged, in conformance with the recommendations of the joint manufacturer as approved by the A/E.

- Q. Install flanged ductile iron pipe in accordance with the manufacturer's recommendations. Place gaskets in position without damage. Discard and replace any gasket damaged in the process. Attach gaskets to the flange with rubber gum before the joint is made up in a manner that will prevent displacement. After the pipes have been properly centered and adjusted to true line and grade, firmly bolt them together, taking care to tighten all nuts around the flange to the same degree of pressure.
- R. Install a sewage air release or a combination valve at all high points as shown on the Drawings.
- S. Test all force main in accordance with the provisions of Section 13 of AWWA C600. For the pressure test, subject the force main to a pressure of 200 psi; for the leakage test, to a pressure of 100 psi. If the testing reveals any cracked or defective pipes, fittings, or valves, replace them with sound material, and then repeat the testing until the results are satisfactory to the A/E.
- T. Perform all tests and provide all labor, equipment, etc., needed to do so at no extra cost to the Owner.
- U. After completing each section of force main, remove all debris and all construction materials and equipment from the work site. Then grade and smooth over the surface on both sides of the main. The entire area shall be clean and left in a condition satisfactory to the A/E.
- V. The detectable tape shall be buried in the utility line trench directly above the installation to be identified. A vertical distance of approximately 12 inches between the installation and the marking tape shall be provided. The tape shall be placed in the trench with the printed side up, and be essentially parallel to the finished surface. The Contractor will take necessary precautions to ensure that the tape is not pulled, distorted, or otherwise misplaced in completing the trench backfill. Tape will be placed in all trenches above all nonmetallic pipe used, both main and service lines.

3.2 HYDROSTATIC TESTS

A. Pressure Test

1. After pipe has been laid and backfilled as specified above, subject all newly laid pipe or any valved section thereof to a pressure of 200 psi.
2. The duration of each pressure test shall be at least 1 hour.

- 3.. Slowly fill each valved section of pipe with water, and apply the specified test pressure (based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge) with a pump connected to the pipe in a manner satisfactory to the A/E. This pipe shall be filled 24 hours prior to testing. Furnish the pump, pipe, connections, gauges, and all necessary apparatus.
- 4.. Before applying the specified test pressure, expel all air from the pipe. If blowoffs are not available at high places, make the necessary taps at the points of highest elevation before testing, and insert plugs after the test has been completed.
- 5.. Carefully examine all exposed pipes, fittings, and valves during the test. Remove any cracked or defective pipes, fittings, or valves discovered in consequence of this pressure test, and replace with sound material in the manner specified. Repeat the test until the results are satisfactory to the A/E.

B. Leakage Test

- 1.. Begin the leakage test immediately after the pressure test has been satisfactorily completed. Furnish the pump, pipe, connections, gauges, measuring devices, and all other necessary apparatus as well as all necessary assistance to conduct the test.
- 2.. The duration of each leakage test shall be 2 hours; during the test, subject the main to a pressure of 100 psi.
- 3.. Leakage is defined as the amount of water which must be supplied to the newly laid pipe or any valved section in order to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.
- 4.. No pipe installation will be accepted until the leakage is less than the number of gallons per 2 hour period listed below:

<u>Gallons per 1,000 Feet of Pipe</u>	<u>Pipe Sizes</u>
1-1/2" - 2-1/4"	0.2
3"	0.3
4"	0.4
6"	0.6
8"	0.8
10"	1.0
12"	1.1
14"	1.3
16"	1.5

18"	1.7
20"	1.9
24"	2.2
30"	2.8

5. Should any test of pipe laid disclose leakage greater than that specified, the Contractor shall, at his own expense, locate and repair the defective joints until the leakage is within the specified allowance.

3.3 CLEANUP: After completing each section of force main, remove all debris and all construction materials and equipment from the work site. Then grade and smooth over the surface on both sides of the main. The entire area shall be clean and left in a condition satisfactory to the A/E.

END OF SECTION

SECTION 03303

CONCRETE FOR UTILITY LINES

PART 1 GENERAL

1.1 This item shall include furnishing and installing concrete blocking, cradles, anchors, caps, pipe protection, and/or encasement at the locations shown on the drawings and/or as directed by the A/E.

PART 2 PRODUCTS

2.1 Concrete work shall conform to ACI 301-72 (as revised), as modified by the supplemental requirements below:

PART 3 EXECUTION

3.1 Strength

The strength of concrete shall be 3,000 psi unless otherwise shown on the drawings.

3.2 Durability

All concrete exposed to weather shall be air entrained.

3.3 Slump

Concrete shall be proportional and produced to have a slump of 3 inches with a 1 inch tolerance.

3.4 Admixtures

Air entrainment, mandatory for concrete exposed to weather, may be used. A water reducing admixture (retarding, normal, or accelerating, depending on placing temperature), may be used if approved by the A/E.

3.5 Reinforcing Steel

Yield strength of reinforcing steel shall be 60,000 psi.

END OF SECTION

SECTION 11394

PREFABRICATED GRINDER SEWAGE PUMP STATIONS

PART 1 GENERAL

1.1 The Contractor shall furnish and install a factory-built simplex or duplex grinder pump station consisting of either one or two grinder pump units as applicable at the locations shown on the Drawings. All pumps in any one project shall be by the same manufacturer.

1.2 The Contractor shall be responsible for all material furnished by him and shall replace at his own expense all such material found defective in manufacture or damaged on delivery. This shall include the furnishing of all material and labor required for the replacement of installed material discovered defective.

1.3 The Contractor shall be responsible for the safe storage of material furnished by him until it has been incorporated in the completed project. All motors and electrical and mechanical components shall be stored in a dry environment. The interior of all pipe, fittings, and other accessories shall be kept free from dirt and foreign matter at all times.

PART 2 PRODUCTS

2.1 GRINDER PUMP: The manufacturer shall furnish a factory built simplex or duplex grinder pump station consisting of either one or 2 grinder pump units as applicable with mercury switch level controls, discharge piping, cast iron discharge base and lower guide rail support, pump mounting plates with bottom rail supports, upper rail supports or guide rails (1 inch corrosion resistant structural plastic), lifting chain, steel pump cover plate, and all necessary parts and equipment installed in a fiberglass reinforced polyester tank as described in the following specifications. The grinder pump station shall be as manufactured by Hydro-O-Matic Pump Division or F. E. Myers Company - Model WG20. Simplex grinder pump stations shall be used for single family residence only.

2.2 OPERATING CONDITIONS: The pumps shall be of a centrifugal type. The pumps provided shall be capable of delivering a minimum of 16 gpm against a normal rated total dynamic head of 85 feet with a maximum shutoff head of 110 feet. Pump motor shall be a minimum of 2 HP, single phase, 230V, 3,450 rpm, 60 cycle. The pumps shall be free from harmful effects of cavitation at either high or low head.

2.3 TANK

- A. The tank shall be a minimum of 24 inch diameter for simplex systems and a minimum of 36 inch diameter for duplex systems.
- B. The tank shall be molded of fiberglass reinforced polyester resin of the lay-up and spray technique to ensure that the interior surface is smooth and resin rich.
- C. The tank shall have a minimum wall thickness of 1/4 inch. A heavy rib or flange shall extend around the basin for strength and shall have holes through the rib for anchoring in concrete to prevent flotation.
- D. A basin inlet flange with "O" ring seal for 4 inch Schedule 40 plastic pipe shall be included but not mounted on the basin. The flange shall be mounted in the field at inlet height required by the installation.
- E. The basin discharge piping shall exit the basin through the side of the basin and shall consist of 1-1/4 inch NPT coupling in a watertight, rubber O-ring sealing flange.

2.4 TANK COVER

- A. The cover shall be of 3/8 inch polypropylene. The cover shall be bolted to the basin with stainless steel cap screws. Cadmium plated nuts for screws shall be completely imbedded in the fiberglass to prevent turning and for corrosion resistance. The cover shall be sealed with a dense foam or rubber gasket fastened to the covers.

2.5 CHECK VALVE: A true union ball check valve shall be installed in the discharge line outside of the wetwell.

2.6 SHUTOFF VALVE: A 1-1/4 inch PVC true union ball valve with extension handle shall be installed in the discharge line outside of the wetwell for closing when the pump assembly is removed.

2.7 QUICK DISCONNECT: A riser in the discharge piping with quick disconnect and valves outside the pump station for emergency use.

2.8 PUMP AND MOTOR

- A. The grinder pump and motor shall be especially designed and manufactured in order to operate completely submerged in the liquid being pumped. Electrical power cord shall be sealed by use of a cord grip with individual conductors additionally sealed into the cord cap assembly

with epoxy sealing compound, thus eliminating water getting into the motor by following individual conductors inside the insulation. The cord grip shall have a male taper pipe thread which is threaded into a female taper pipe thread in a cord cap. The cord cap shall be sealed into the motor housing with a Buna-N O-ring, providing an electrical connection which is completely watertight, yet may be easily removed for service.

- B. The combination centrifugal pump impeller and grinder unit shall be attached to a common motor and pump shaft made of stainless steel. The grinder unit shall be on the suction side of the pump impeller and discharging directly into the impeller inlet leaving no exposed shaft to permit packing of ground solids. The grinder shall have 2 stages or have grinding impeller and shredding ring. Both stationary and rotating cutters shall be made of hardened and ground stainless steel. Pump and motor housing shall be high quality grey iron castings. Impeller shall be bronze. All fasteners shall be of a high grade stainless steel.
- C. The pump motor shaft shall be sealed by 2 mechanical carbon and ceramic faced seals within an oil filled chamber to provide clean, constant lubrication. The shaft shall be supported by a ball radial and thrust bearing and a lower bronze radial sleeve bearing, between bearing, between the shaft seals to minimize overhang, both running in oil.
- D. The motor winding and rotor shall be mounted in a sealed, submersible type housing which is filled with clean high dielectric oil for bearing lubrication and to transmit heat from motor winding to outer housing. Motor winding shall be securely held in the housing with machine screws or it shall be pressed into the housing.
- E. The unit furnished shall comply with all applicable electrical codes.

2.9 CONTROLS FOR SIMPLEX STATION

- A. Sealed float type mercury switches shall be supplied to control sump level and alarm signal. The mercury tube switches shall be sealed in a solid polyurethane float for corrosion and shock resistance. The support wire shall have heavy Neoprene jacket and a weight shall be attached to the cord above the float to hold the switch in place in the sump. The weight shall be above the float to prevent sharp bends in the cord when the float operates under water. The float switches shall hang in the sump supported only by the cord that is held to the

NEMA 4 cast iron or cast aluminum junction box. Condulet fittings shall be furnished for sealing cords from the control box into the conduit entering the basin. This is to prevent sewer gases from carrying to the control box. Quick change out connections shall be provided for the power cord from the pump to the basin junction box. Two float switches shall be used to control level. One for pump turn-on, one for pump turn-off, and a third switch shall be provided for alarm control.

- B. A red alarm light and audio alarm shall be supplied for mounting on the control box.

2.10 OPERATION OF SIMPLEX SYSTEM: On sump level rise the lower mercury switch shall first be energized, then the upper level switch shall energize and start the pump. With the pump operating, sump level shall lower to low switch turn-off setting and the pump shall stop. If the level continues to rise when the pump is operating, the alarm switch shall energize. All level switches shall be adjustable for level setting from the surface. Level switches shall be set to limit fill time to 30 minutes maximum.

2.11 ELECTRICAL CONTROL PANEL FOR SIMPLEX STATION: The control panel shall have a NEMA 3 weatherproof enclosure. A lock hasp with lock (keyed to HVUD Master) shall be provided on the door. A circuit breaker shall be provided for the pump and a magnetic starter with one leg overload protection for single phase operation shall be supplied. H-O-A switches and run lights shall be supplied for the pump. A terminal strip shall be provided for connecting pump and control wires. Additional terminals shall be provided to connect the alarm. The control circuit shall be 115V or a transformer shall be supplied to give 24V control circuit. The control panel shall be UL listed.

2.12 CONTROLS FOR DUPLEX STATION

- A. Sealed float type mercury switches shall be supplied to control sump level and alarm signal. The mercury tube switches shall be sealed in a solid polyurethane float for corrosion and shock resistance. The support wire shall have a heavy neoprene jacket. A weight shall be attached to the cord above the float to hold the switch in place in the sump. The weight shall be above the float to effectively prevent sharp bends in the cord when the float operates. The float switches shall hang in the sump supported only by the cord that is held to the NEMA 4 cast iron or cast aluminum junction box. Three float switches shall be used to control level. One for pump turn-on, one for sump turn-off, and one for both pumps turn-on. A fourth switch shall be provided for alarm control.

- B. A red alarm light and audio alarm shall be supplied for mounting on the control box.

2.13 OPERATION OF DUPLEX SYSTEM: On sump level rise, the lower mercury switch shall first be energized, then the upper level switch shall be energized and start the lead pump. With the lead pump operating, sump level shall lower to low switch turn-off setting and the pump shall stop. Alternating relay shall index on stopping of the pump so the lag pump will start on the next operation. If sump level continues to rise when lead pump is operating, override switch shall energize and start lag pump. Both lead and lag pump shall operate together until the low level switch turns off both pumps. If the level continues to rise when both pumps are operating, the alarm switch shall energize and signal the alarm. If one pump should fail for any reason, the second pump shall operate on the override control and if level rises above override control alarm shall signal. All level switches shall be adjustable for level setting from the surface. Level switches shall be set to limit fill time to 30 minutes maximum.

2.14 ELECTRICAL CONTROL PANEL FOR DUPLEX STATION: Control panel shall have a NEMA 3 weatherproof enclosure. A lock hasp with lock (keyed to HVUD Master) shall be provided on the door. A circuit breaker shall be provided for each pump and a magnetic starter with one leg overload protection shall be supplied for each pump. An alternating relay or solid state alternator shall be provided to alternate pumps on each successive cycle of operation. Starters shall have auxiliary contact to operate both pumps on override condition. An interlock relay shall be provided to automatically reconnect the control circuit in case of circuit breaker trip on one pump. H-O-A switches and run lights shall be supplied for each pump. Terminal strip shall be provided for connecting the pump and control wires. Additional terminals shall be provided to connect alarm. Control circuit shall be 115V or a transformer shall be supplied to give 24V control circuit. The control panel shall be UL listed.

2.15 WIRING: It shall be the responsibility of the electrical contractor to furnish and install, according to the Drawings and in compliance with appropriate national and local codes, the branch circuit protection and all wiring to the pump leads and to the high alarm indicator lamp. A disconnect for the pump shall be provided at or near the pump location on the house, as shown on Standard Drawing 711.

2.16 CORROSION PROTECTION: All materials exposed to wastewater shall have inherent corrosion protection; i.e., cast iron, fiberglass, stainless steel, PVC. Any exterior steel surfaces shall be suitably protected against corrosion.

2.17 SERVICEABILITY: The grinder pump unit shall have provision for lifting to facilitate easy removal of the unit from the tank if necessary.

2.18 MANUFACTURER: The equipment specified shall be the product of a company experienced in the design and manufacture of grinder pumps for specific use in low pressure sewage systems. The company shall submit detailed installation and user instructions for its product; submit evidence of an established service support program including complete parts and service manuals; and be responsible for maintaining a continuing inventory of grinding pump replacement parts.

2.19 WARRANTY

- A. The manufacturer shall warrant its product to be free from defects in material and factory workmanship for a period of one year from the date of acceptance. Repair of parts replacement required as a result of such defects will be made free of charge during this period.
- B. The manufacturer shall provide the General Contractor specific instruction on the assembly and installation of the pump stations and related equipment.
- C. The manufacturer will furnish, at his own expense, the services of a factory trained serviceman to instruct the Owner's personnel in the operation and maintenance of the pumps and related equipment. The individual performing the instruction to the Owner shall be trained and/or certified by the manufacturer as its authorized operation, maintenance, and service specialist. Allow a minimum of 1 full day for this instruction. The schedules of the visits shall be approved by the A/E.

PART 3 EXECUTION

3.1 Install the grinder sewage pump station as shown on the Drawings and in accordance with the manufacturer's recommendations.

3.2 Backfill around the basin shall be clean, No. 57 crushed stone, up to 18 inches below top of basin, the remaining 18 inches to be topsoil. Construction paper shall be placed between the stone and topsoil backfill.

3.3 A nipple of 1-1/4 inches, Schedule 80 PVC pipe shall be installed between the basin and the unexcavated portion of earth.

3.4 Obtain the services of the manufacturer's service engineer to check the installation of each grinder sewage pump station and make any field adjustments necessary to ensure proper operation.

END OF SECTION

SECTION 11395

BUILDING PIPING CONNECTIONS TO GRINDER PUMP STATION

PART 1 GENERAL

1.1 Work specified herein consists of providing the piping from existing structures to the publicly-owned gravity sanitary sewers. Depending upon local conditions, a portion of this work may be located within the crawlspace or basement of privately owned structures. Where these specifications differ from local codes, the local codes will apply.

PART 2 PRODUCTS

2.1 Piping shall be Schedule 40 PVC conforming to ASTM D2665-78 or the latest revision thereof.

2.2 Joints for PVC piping shall be solvent welded.

2.3 Flexible couplings shall be used when making transitions from one piping material to the other. These couplings shall be made of rubber and be firmly attached to the connecting pipes with 2 or more stainless steel clamps. Adequate bracing must be provided on either side of the coupling to prevent inadvertent separation of the pipes being joined.

2.4 Fittings shall be PVC conforming to the dimensions, weights, and tolerances required by the type pipe used and solvent welded.

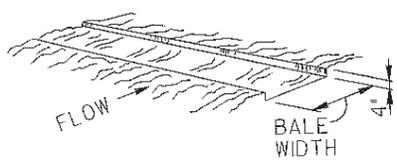
PART 3 EXECUTION

3.1 All materials and installation shall comply with the latest edition of the Standard Plumbing Code.

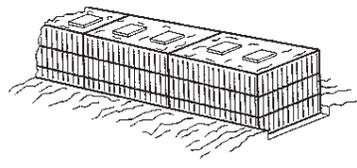
3.2 The Contractor may elect to reroute the "under structure" plumbing to flow from the back to the front of the structure or intercept the sanitary flow just before the septic tank and pipe it to the public sanitary sewer. In either case, adequate fall of 1/8 inch per foot must be provided.

- A. A cleanout is required on all new lines being connected to the public sewer. This cleanout must be located at a point as near as practical to the point of connection to the existing building sewer.

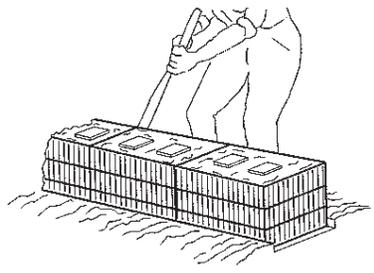
END OF SECTION



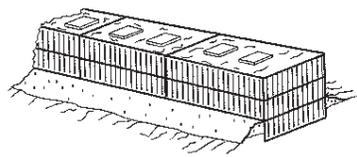
1. EXCAVATE THE TRENCH



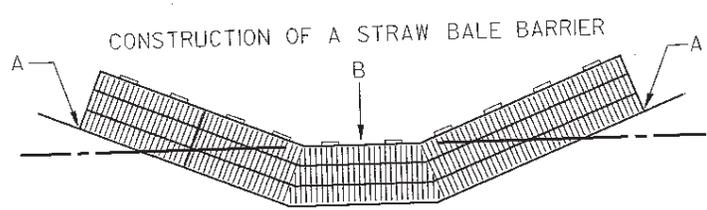
2. PLACE AND STAKE STRAW BALES



3. WEDGE LOOSE STRAW BETWEEN BALES



4. BACKFILL AND COMPACT THE EXCAVATED SOIL



POINTS A SHOULD BE HIGHER THAN POINT B

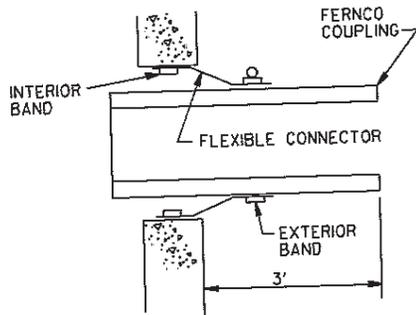
PROPER PLACEMENT OF STRAW BALE BARRIER
IN DRAINAGE WAY

BWSC | BARGE WAGGONER SUMNER & CANNON, INC.
 162 THIRD AVENUE NORTH, NASHVILLE, TENNESSEE 37201
 PHONE: (615) 254-1500 FAX (615) 255-6572
 E-MAIL: NASHVILLE@BARGEWAGGONER.COM
 ENGINEERS ARCHITECTS PLANNERS LANDSCAPE ARCHITECTS SURVEYORS

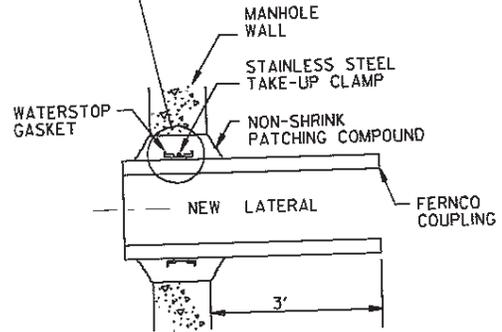
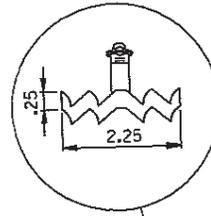
STRAW BERM DETAIL
 FRANKLIN, KENTUCKY

DETAIL NO.:	<i>COII</i>
DATE ISSUED:	JULY 2000
DATE REVISED:	

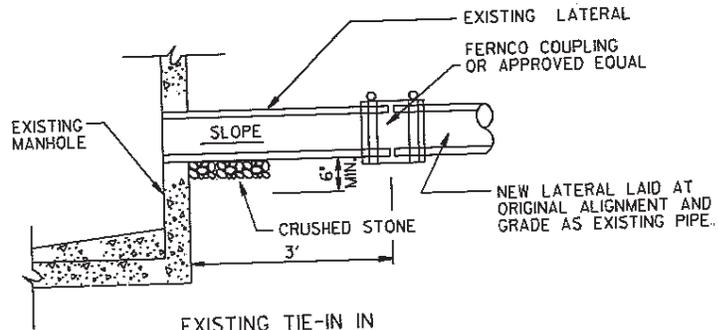
FLEXIBLE MANHOLE CONNECTOR
WITH STAINLESS STEEL EXTERIOR
BAND AND ADJUSTABLE STAINLESS
STEEL OR FIBER-REINFORCED NYLON
INTERIOR BAND



EXISTING TIE-IN REQUIRING
REPLACEMENT (CORED OPENING)



EXISTING TIE-IN REQUIRING
REPLACEMENT (ROUGH OPENING)



EXISTING TIE-IN IN
GOOD CONDITION

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MANHOLE TIE-IN DETAILS

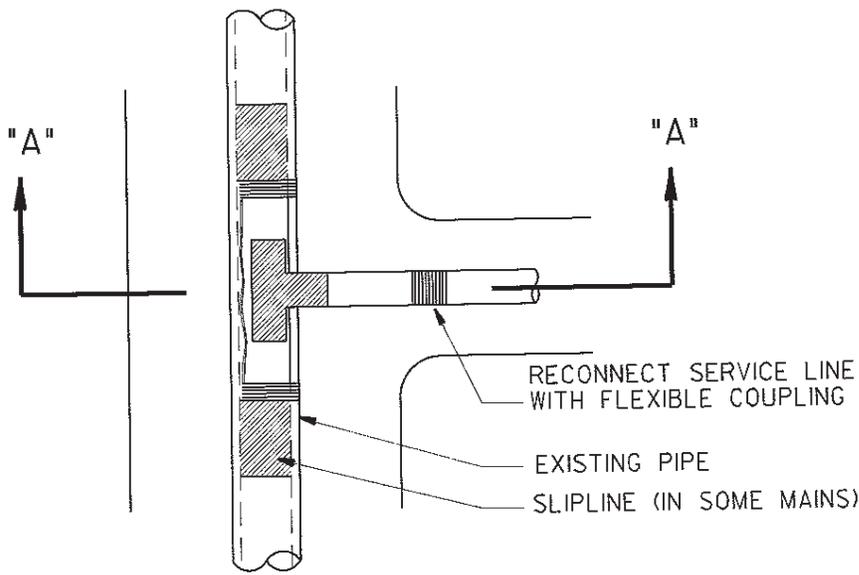
DETAIL NO.: **C020**

DATE ISSUED:
JULY 2000

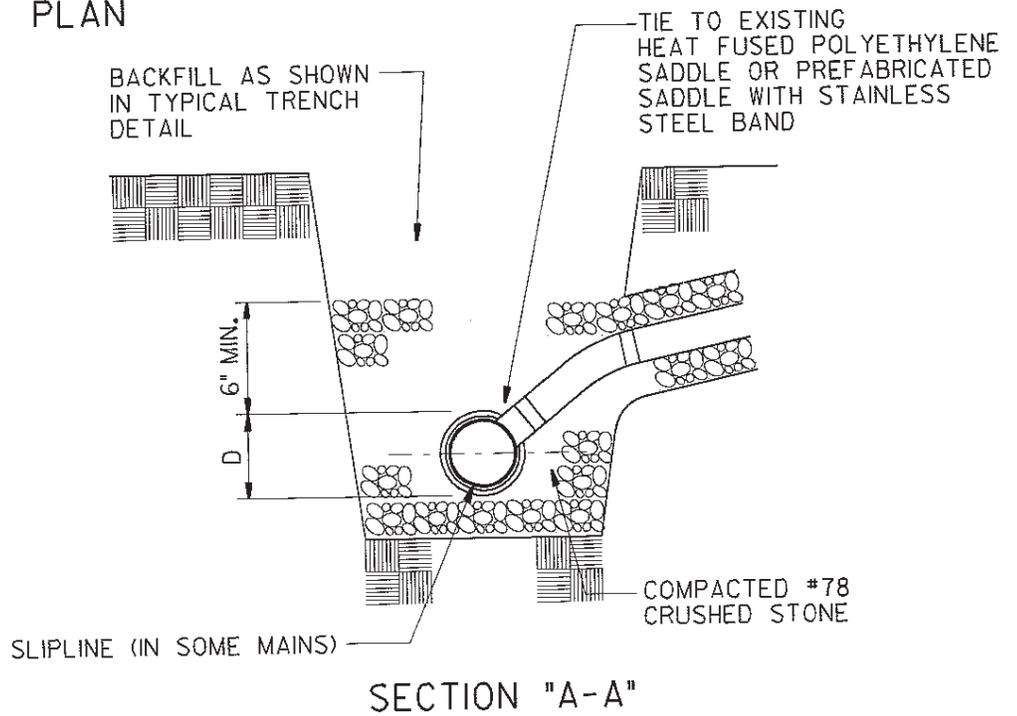
FRANKLIN, KENTUCKY

DATE REVISED:

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PHONE: (615) 254-1500 FAX (615) 255-6572
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PLAN



SECTION "A-A"

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SERVICE CONNECTION DETAIL

DETAIL NO.: **C021**

JULY 2000

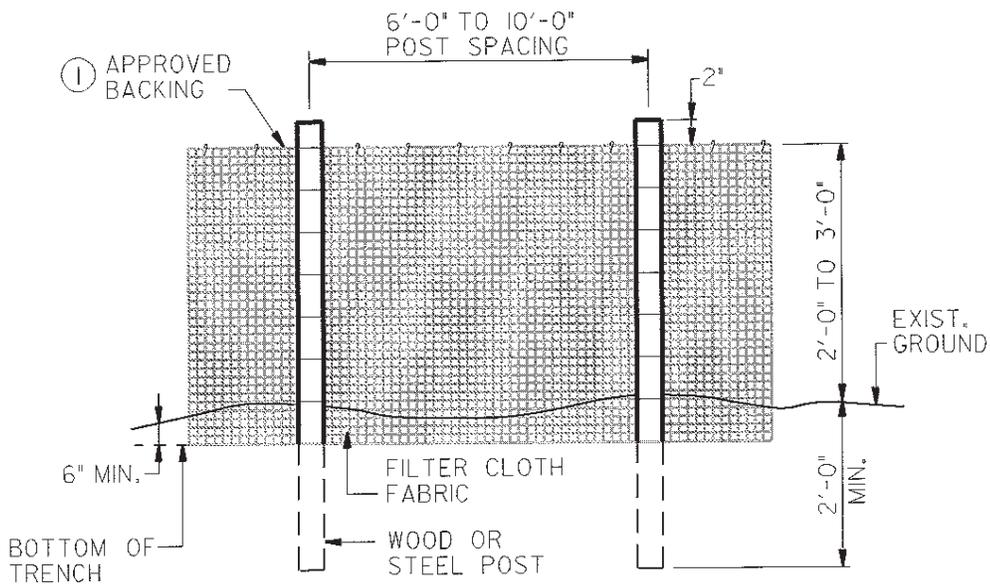
DATE ISSUED:

162 THIRD AVENUE NORTH, NASHVILLE, TENNESSEE 37201
PHONE: (615) 254-1500 FAX (615) 255-6572
E-MAIL: NASHVILLE@BARGEWAGGONER.COM

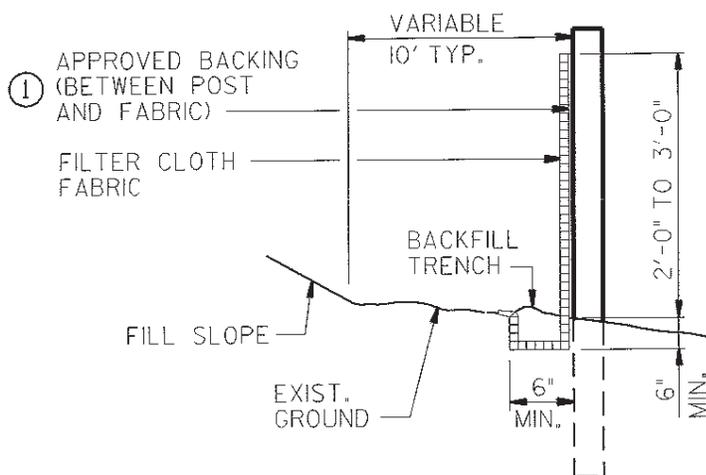
FRANKLIN, KENTUCKY

DATE REVISED:

ENGINEERS ARCHITECTS PLANNERS LANDSCAPE ARCHITECTS SURVEYORS



ELEVATION



SECTION

- ① FILTER CLOTH SHALL HAVE APPROVED BACKING OR A BUILT-IN REINFORCED STRUCTURE, AS RECOMMENDED BY THE MANUFACTURER TO SUPPORT THE FILTER CLOTH.
- ② A PREASSEMBLED SILT FENCE MEETING THE REQUIREMENTS OF THIS DRAWING IS ACCEPTABLE IN LIEU OF A FIELD CONSTRUCTED SILT FENCE.

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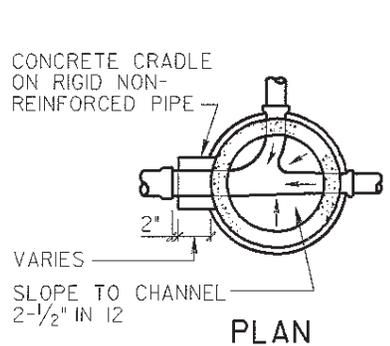
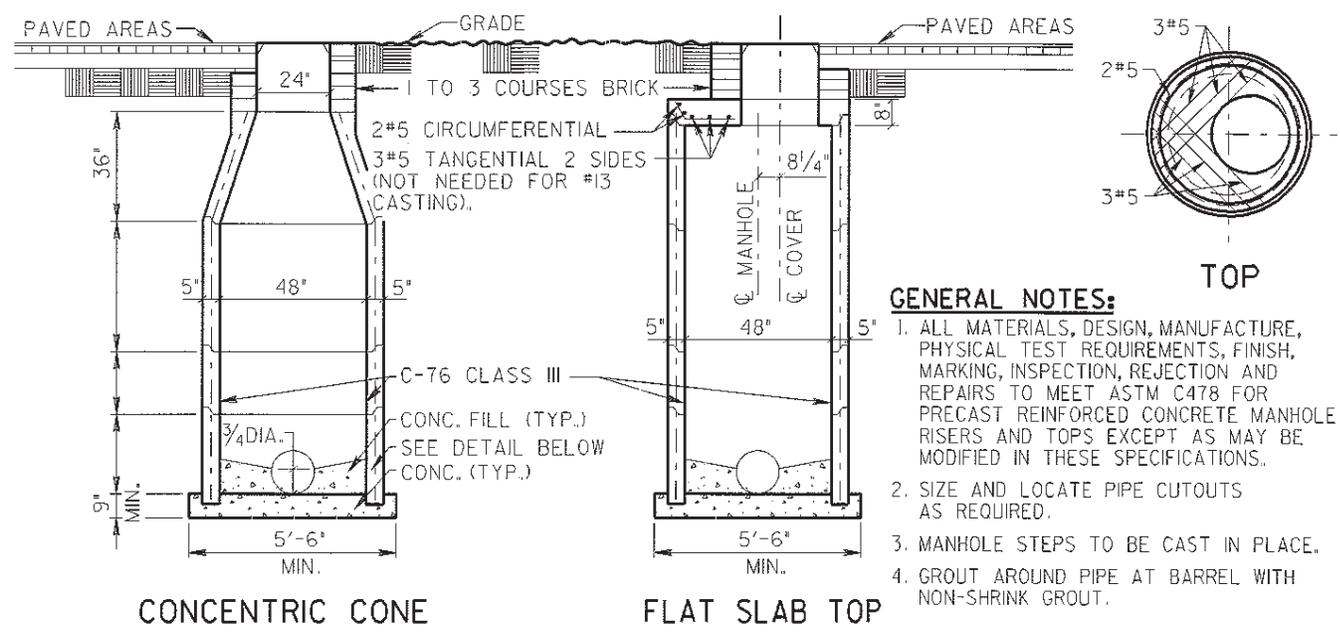
162 THIRD AVENUE NORTH, NASHVILLE, TENNESSEE 37201
PHONE: (615) 254-1500 FAX (615) 255-6972
E-MAIL: NASHVILLE@BARGEWAGGONER.COM

ENGINEERS ARCHITECTS PLANNERS LANDSCAPE ARCHITECTS SURVEYORS

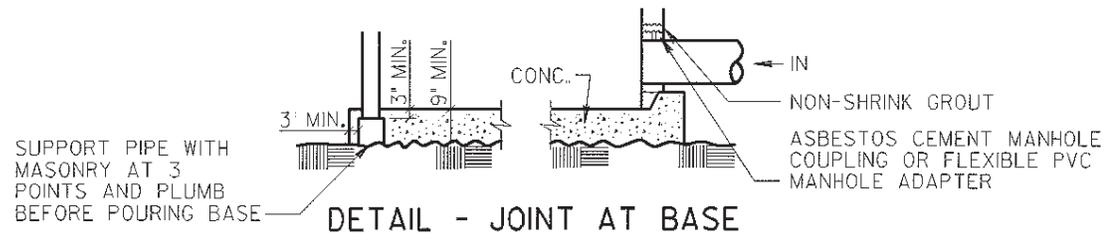
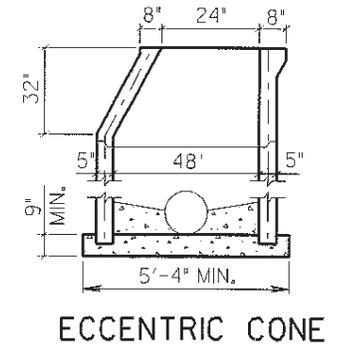
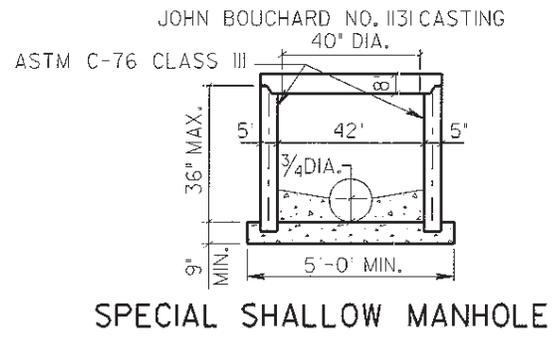
TEMPORARY SILT FENCE

FRANKLIN, KENTUCKY

DETAIL NO.: **C030**
JULY 2000
DATE ISSUED:
DATE REVISED:



INVERT OF CHANNEL TO CLOPE ACROSS MANHOLE FROM INVERT OF OUTLET TO INVERT OF EACH INLET OR 6' WHICHEVER IS LESS



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ENGINEERS ARCHITECTS PLANNERS LANDSCAPE ARCHITECTS SURVEYORS

STANDARD PRECAST CONCRETE MANHOLES

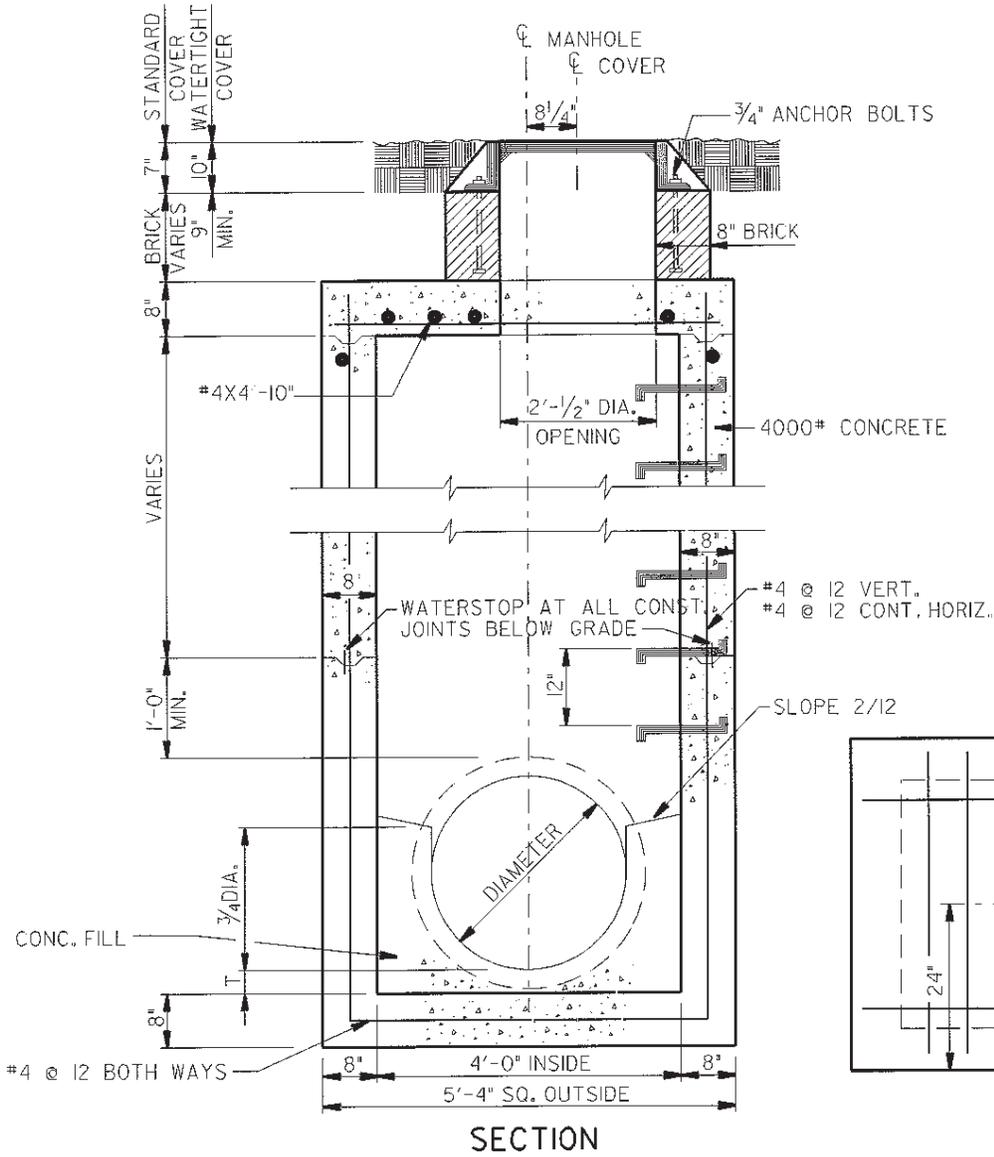
FRANKLIN, KENTUCKY

DETAIL NO.: **C101**

JULY 2000

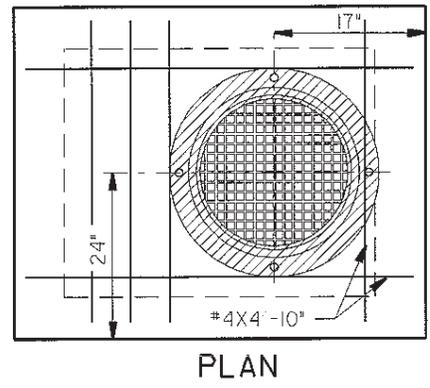
DATE ISSUED:

DATE REVISED:



PLACE BASE AND WALL
IN SINGLE POUR OR
PROVIDE 6 WATERSTOP
AT CONSTRUCTION JOINTS

SECTION
(24" SEWER & SMALLER.: OF 30° OR LESS)



PLAN

BWSC

**BARBE WAGGONER
SUMNER &
CANNON, INC.**

**CAST-IN-PLACE STANDARD
CONCRETE MANHOLES**

DETAIL NO.: **C105**

JULY 2000

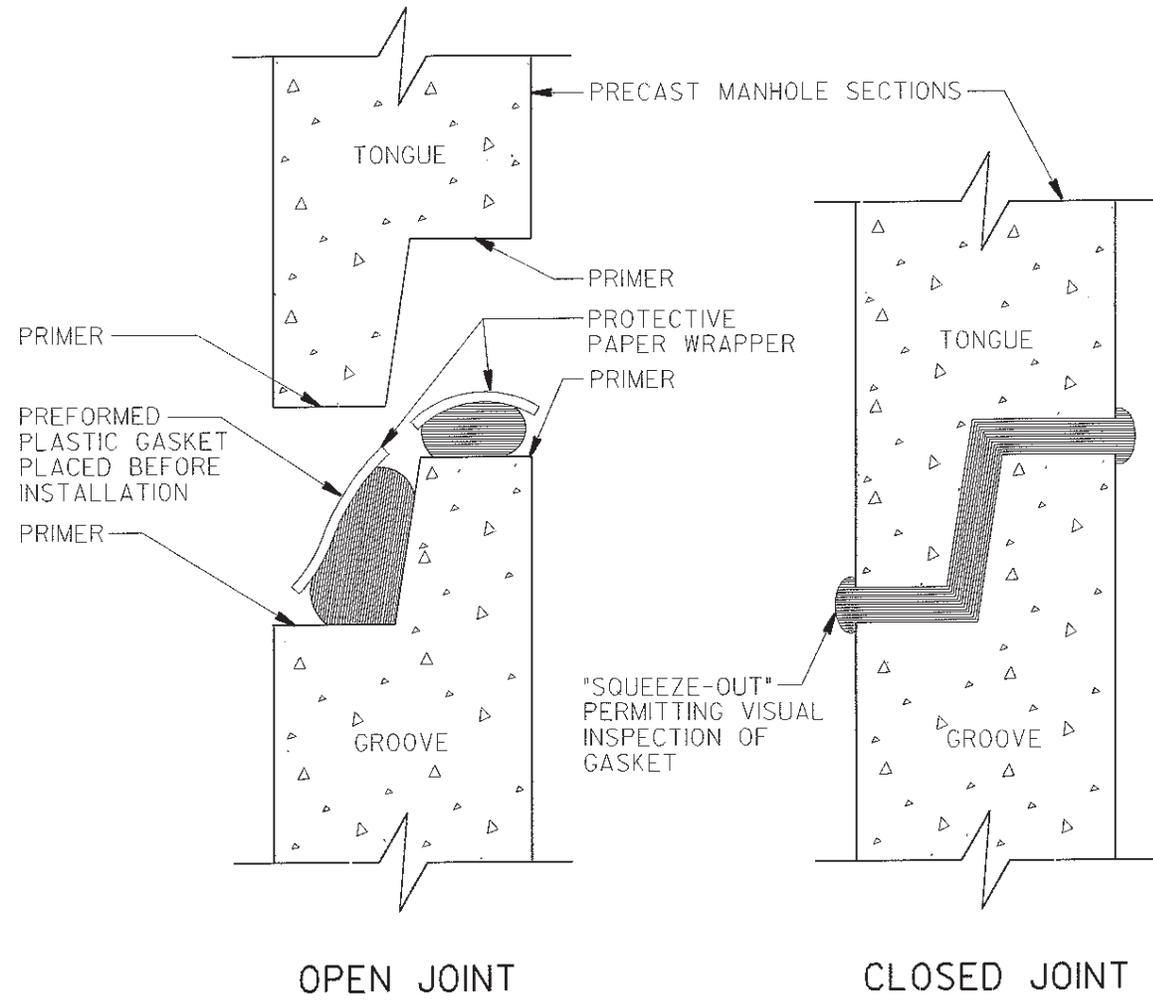
FRANKLIN, KENTUCKY

DATE ISSUED:

DATE REVISED:

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NOTE:
WHERE MASTIC DOES NOT PROTRUDE, EITHER
INSIDE OR OUTSIDE, POINT UP JOINT WITH GROUT.



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**PLASTIC GASKET FOR
PRECAST MANHOLE**

C106

DETAIL NO.:

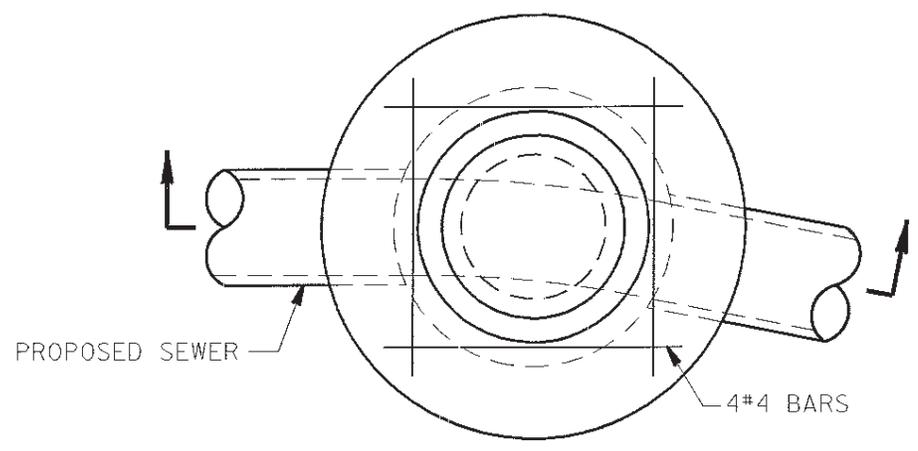
JULY 2000

DATE ISSUED:

FRANKLIN, KENTUCKY

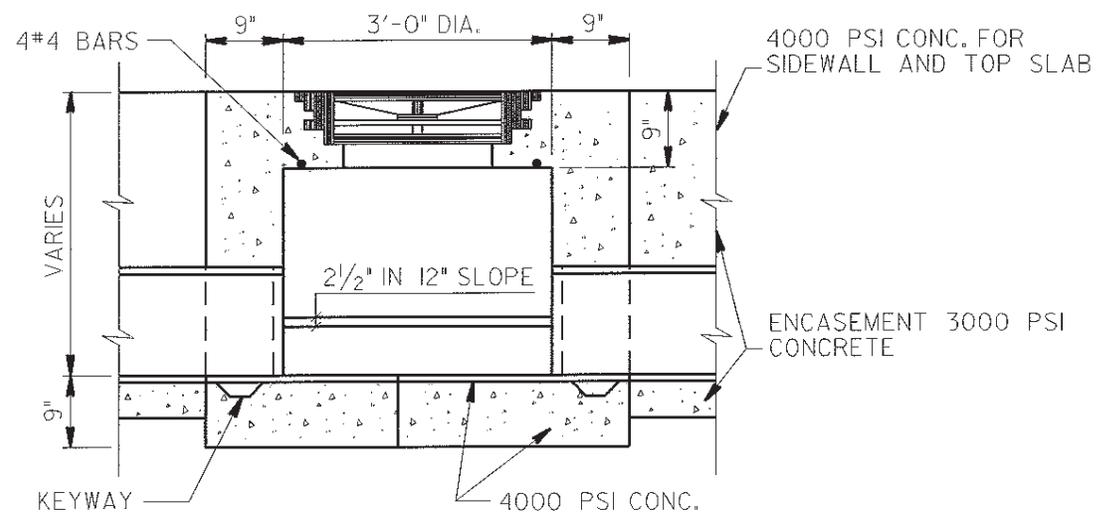
DATE REVISED:

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ENGINEERS ARCHITECTS PLANNERS LANDSCAPE ARCHITECTS SURVEYORS



PLAN

MANHOLE FRAME AND COVER
NEENAH FOUNDRY CO. CAT. NO.
R-6475-A1 WITH RUBBER GASKET
SEAL AND ANCHOR RING BOUCHARD
NO. 1121 WITH O-RING GASKET

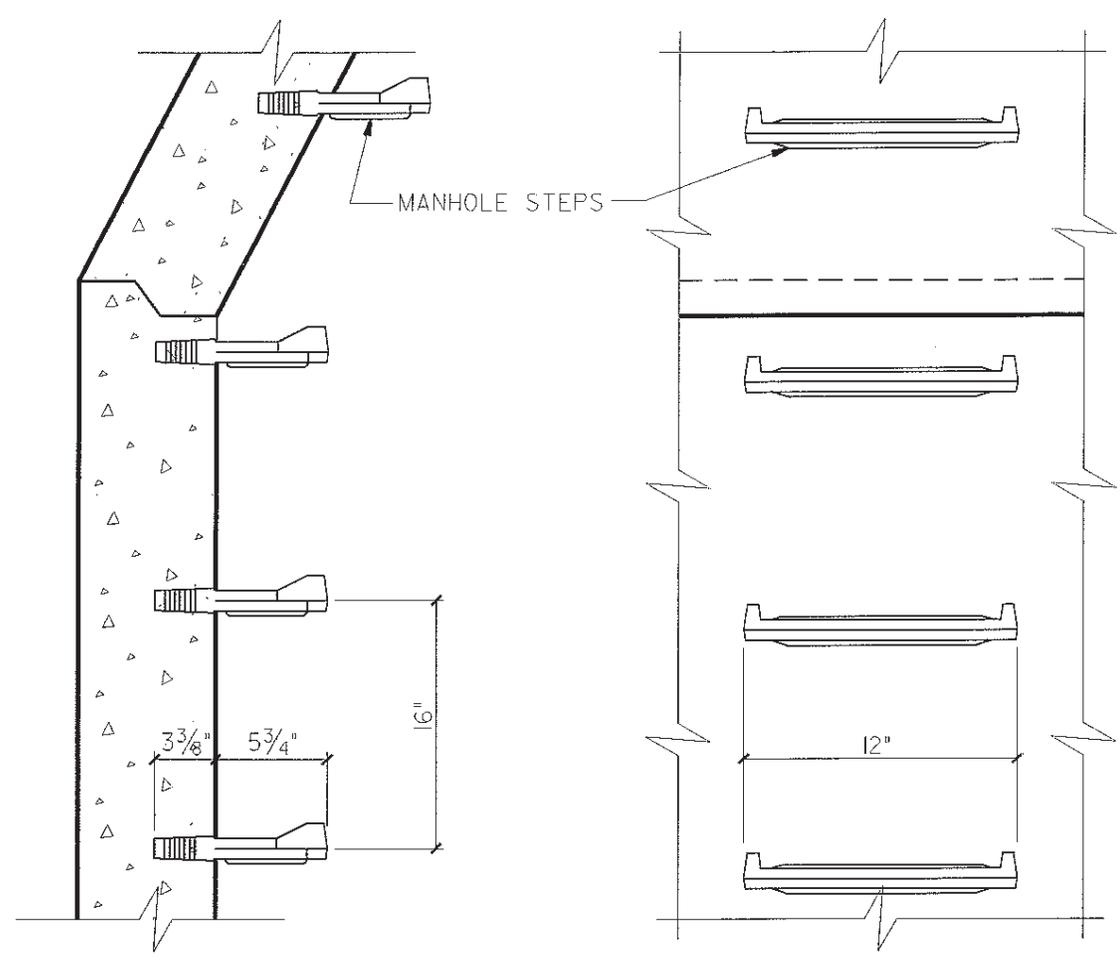


SECTION

NOTE:
SIDEWALL AND TOP SLAB SHALL BE MONOLITHIC.

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		<p>DATE ISSUED: JULY 2000</p>
<p>FRANKLIN, KENTUCKY</p>		<p>DATE REVISED:</p>

NOTE:
3/8" STEEL REINFORCED ROD ENCAPSULATED
IN POLYPROPYLENE PLASTIC OR EQUAL



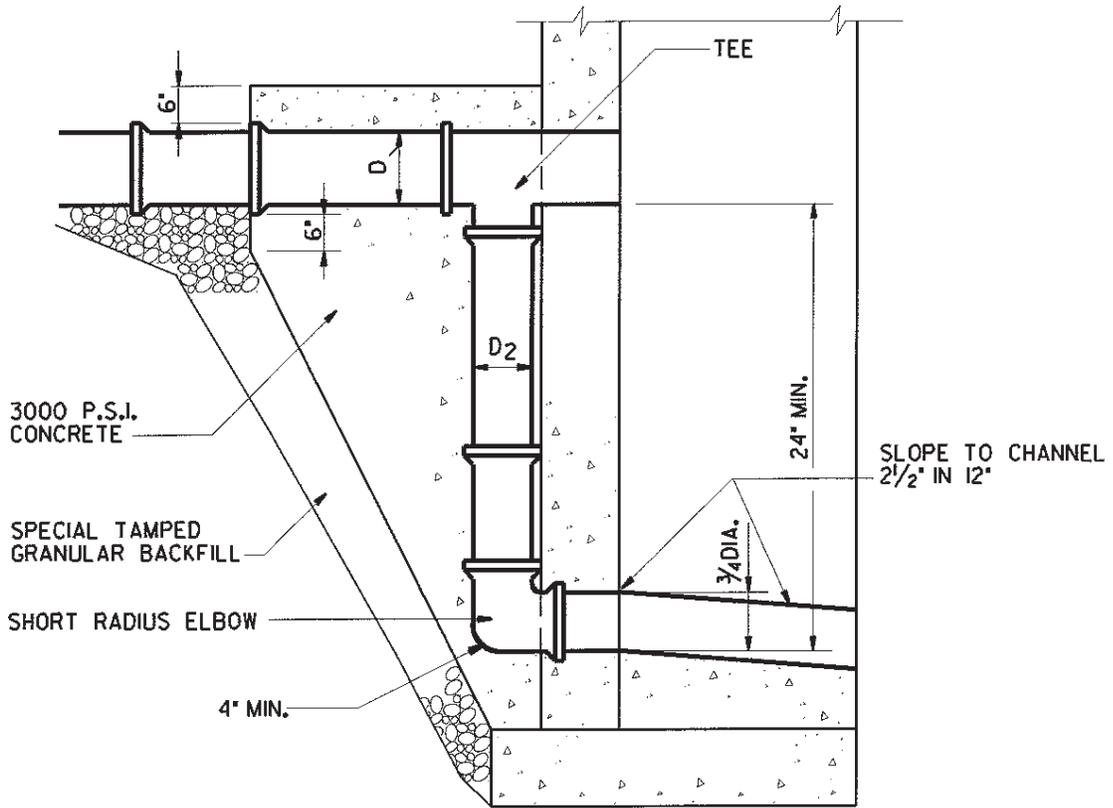
SECTION

ELEVATION

 <p>BARGE WAGGONER SUMNER & CANNON, INC.</p> <p>162 THIRD AVENUE NORTH, NASHVILLE, TENNESSEE 37201 PHONE: (615) 254-1500 FAX (615) 255-6572 E-MAIL: NASHVILLE@BARGEWAGGONER.COM</p> <p>ENGINEERS ARCHITECTS PLANNERS LANDSCAPE ARCHITECTS SURVEYORS</p>	<p>DETAIL OF STANDARD LADDER BARS</p>		<p>DETAIL NO.: C108</p>
	<p>FRANKLIN, KENTUCKY</p>		<p>JULY 2000</p> <p>DATE ISSUED:</p> <p>DATE REVISED:</p>

NOTES:

1. SET INLET FROM DROP TO MATCH CROWNS WITH OUTLET EXCEPT THAT MINIMUM FALL ACROSS M.H. INVERT MUST BE 3".
2. WHERE CALLED FOR UNIT PRICE EXTRA FOR DROP MANHOLE CONNECTIONS, THIS SHALL INCLUDE ALL ITEMS NOT NORMALLY INCLUDED IN STANDARD MANHOLE ITEMS, SUCH AS CONCRETE ENCASEMENT, ETC. NECESSARY AND APPURTENANT TO COMPLETION OF DROP MANHOLE CONNECTIONS.
3. FOR DETAILS NOT SHOWN SEE STANDARD MANHOLE DETAIL 101.



D ₁	D ₂
8"	8"
10"	10"
12"	12"
15"	15"
18"	18"

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 ENGINEERS ARCHITECTS PLANNERS LANDSCAPE ARCHITECTS SURVEYORS

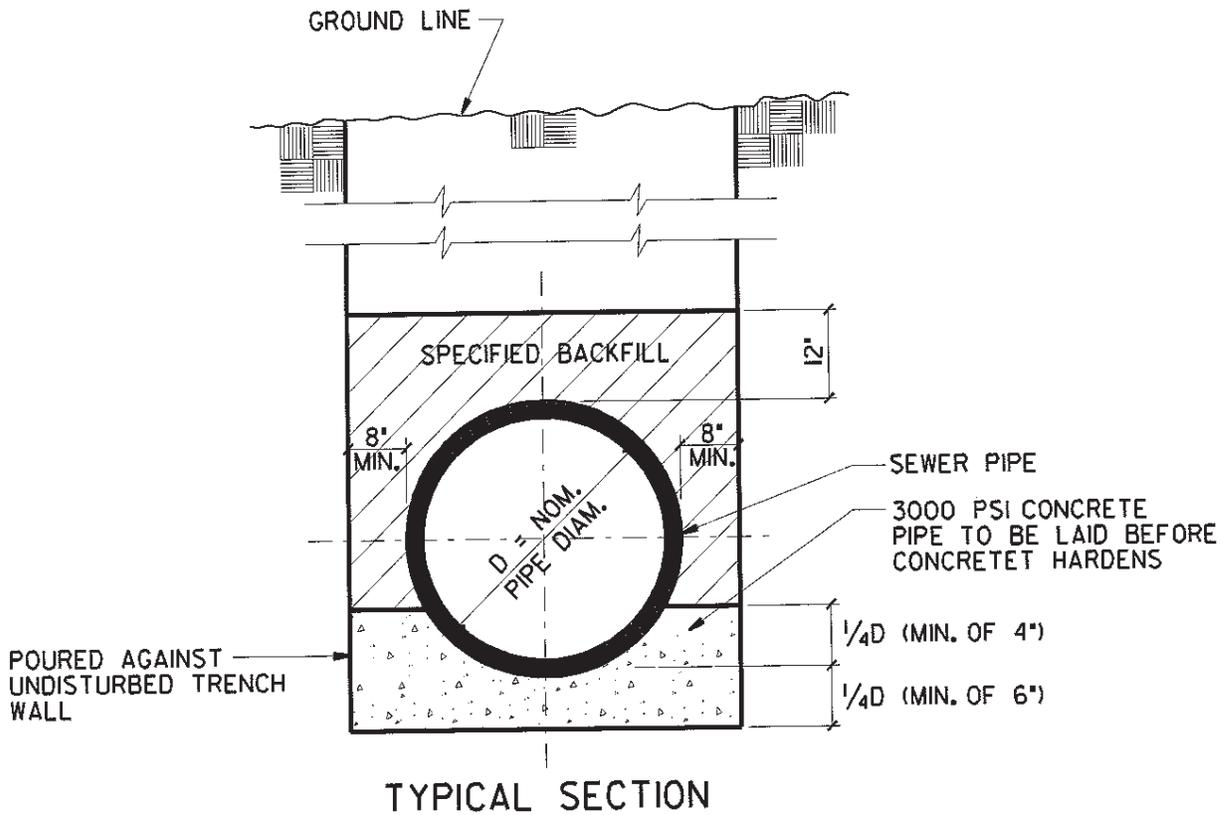
STANDARD DROP MANHOLE

FRANKLIN, KENTUCKY

DETAIL NO.: **CI10**

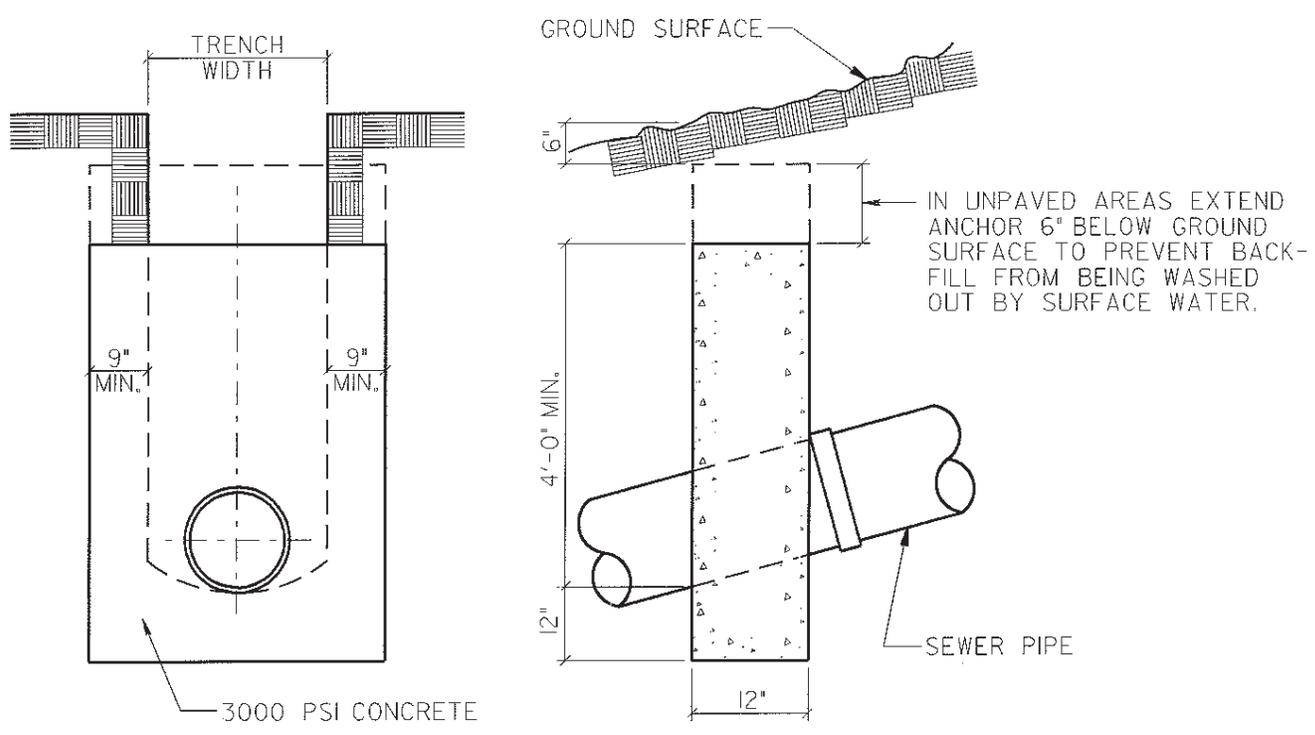
DATE ISSUED: **JULY 2000**

DATE REVISED:



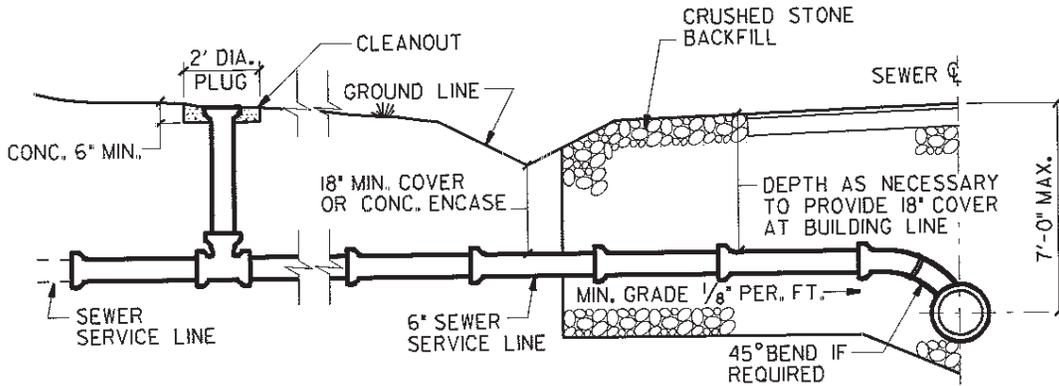
NOTE:
CONCRETE TO BE POURED 16 HOURS BEFORE
BACKFILL IS PLACED AND IN SUCH A MANNER
AS TO PREVENT THE PIPE FROM FLOATING

<p>BARGE WAGGONER SUMNER & CANNON, INC.</p> <p><small>162 THIRD AVENUE NORTH, NASHVILLE, TENNESSEE 37201 PHONE: (615) 254-1500 FAX: (615) 255-6572 E-MAIL: NASHVILLE@BARGEWAGGONER.COM</small></p> <p><small>ENGINEERS ARCHITECTS PLANNERS LANDSCAPE ARCHITECTS SURVEYORS</small></p>	<p>CONCRETE CRADLE</p>	<p>DETAIL NO.: <i>CIII</i></p>
	<p>FRANKLIN, KENTUCKY</p>	<p>DATE ISSUED: JULY 2000</p> <p>DATE REVISED:</p>



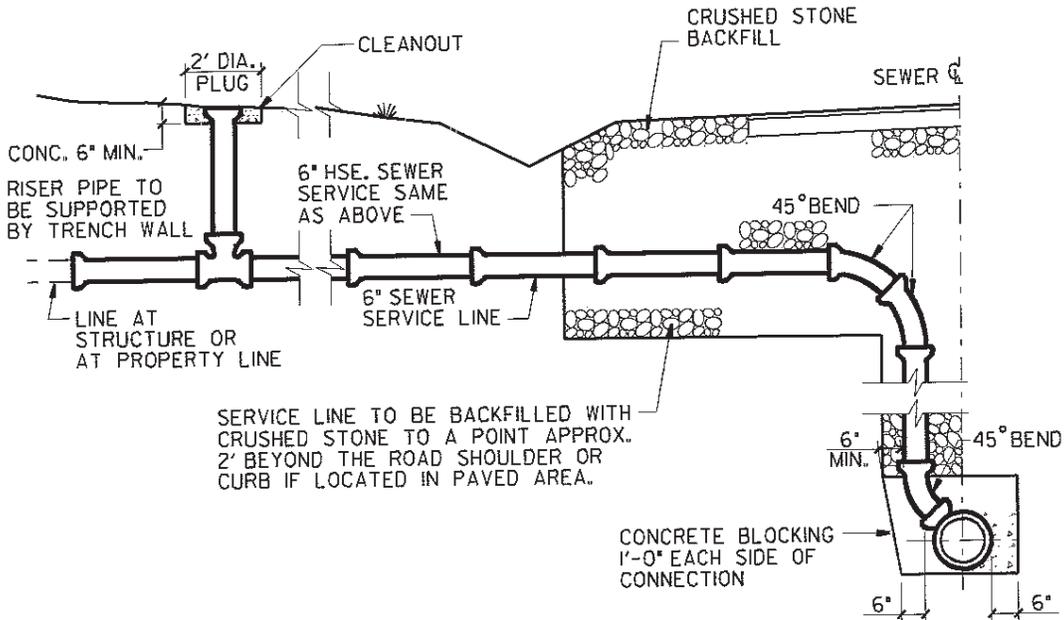
PROVIDE NO ANCHORS ON GRADES LESS THAN 20% UNLESS NOTED.
 PROVIDE ANCHOR 36' CENTER TO CENTER ON GRADES BETWEEN 20% & 34%.
 PROVIDE ANCHOR 24' CENTER TO CENTER ON GRADES BETWEEN 34% & 50%.
 PROVIDE ANCHOR 16' CENTER TO CENTER ON GRADES BETWEEN 50% & 70%.
 CONTRACTOR MAY SUBMIT ALTERNATE DESIGN UTILIZING ROCK BOLTS TO KEY ANCHOR TO ROCK TRENCH.
 FOR CONDITIONS OTHER THAN SHOWN HEREON ANCHORS SHALL BE PROVIDED AS REQUIRED BY THE CONTRACT PLANS OR ORDERED BY THE ENGINEER.

 <p>BARGE WAGGONER SUMNER & CANNON, INC.</p> <p>162 THIRD AVENUE NORTH, NASHVILLE, TENNESSEE 37201 PHONE: (615) 254-1500 FAX (615) 255-6572 E-MAIL: NASHVILLE@BARGEWAGGONER.COM</p> <p>ENGINEERS ARCHITECTS PLANNERS LANDSCAPE ARCHITECTS SURVEYORS</p>	<p>CONCRETE ANCHORS FOR SEWERS ON STEEP GRADES</p> <p>FRANKLIN, KENTUCKY</p>	<p>DETAIL NO.: C122</p>
		<p>DATE ISSUED: JULY 2000</p>
		<p>DATE REVISED:</p>



NOTE:
C.O. TO BE 5' TO 10'
FROM STRUCTURE OR
AT PROPERTY LINE

TEE BRANCH



SERVICE LINE TO BE BACKFILLED WITH
CRUSHED STONE TO A POINT APPROX.
2' BEYOND THE ROAD SHOULDER OR
CURB IF LOCATED IN PAVED AREA.

CONCRETE BLOCKING
1'-0" EACH SIDE OF
CONNECTION

**TEE BRANCH FOR SEWER
DEPTHS OF 7'-0" OR MORE
(10" DIAMETER OR SMALLER)**

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SANITARY SEWER LATERALS

DETAIL NO.: **C128**

JULY 2000

DATE ISSUED:

FRANKLIN, KENTUCKY

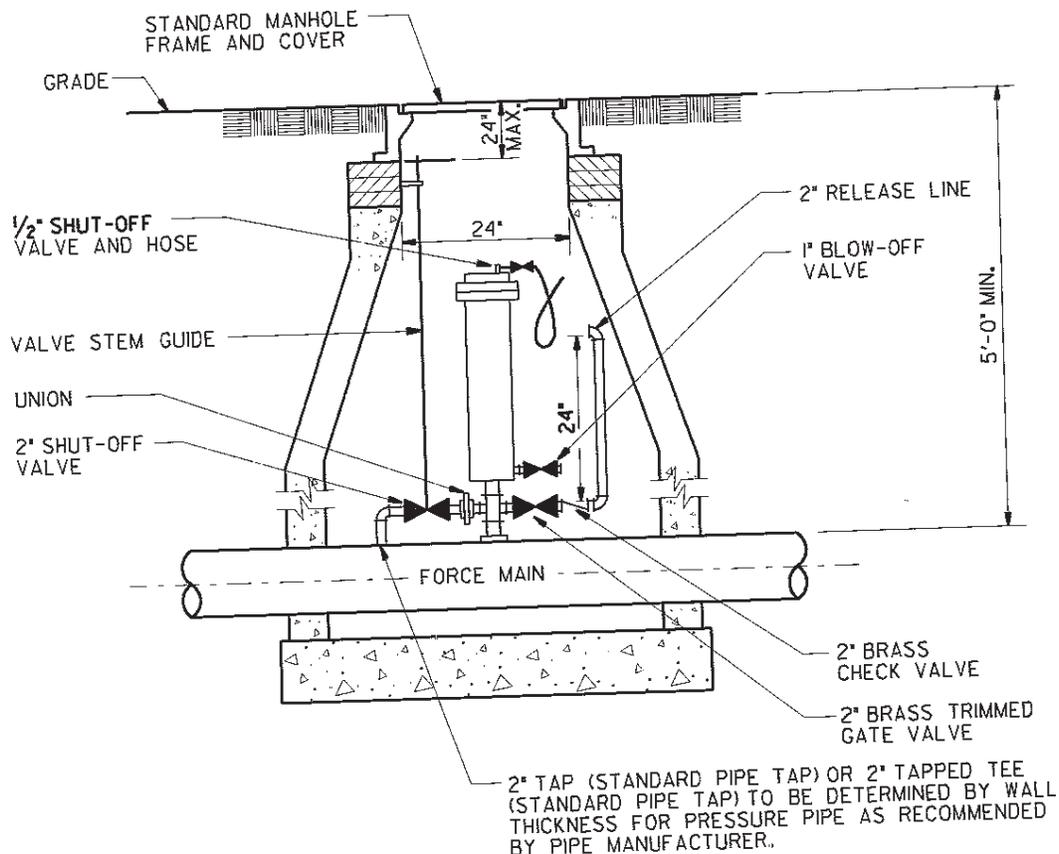
DATE REVISED:

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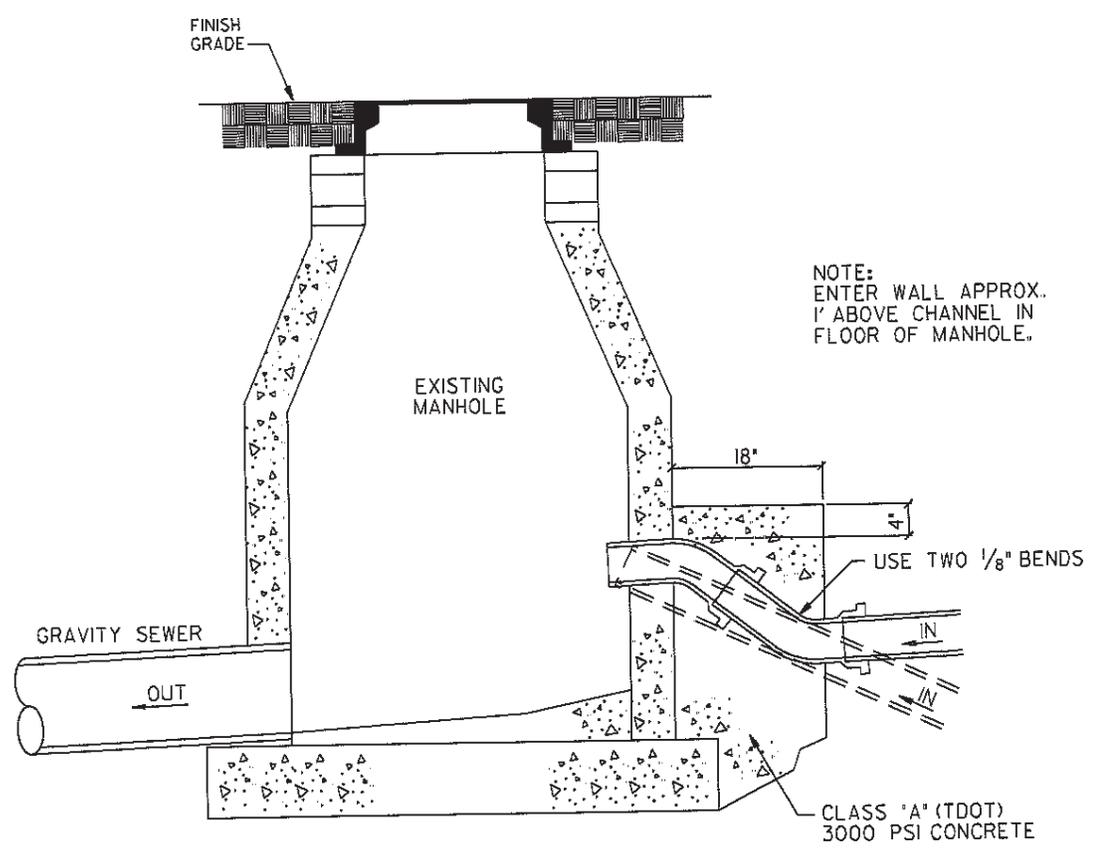
ENGINEERS ARCHITECTS PLANNERS LANDSCAPE ARCHITECTS SURVEYORS

NOTES:

1. AIR RELEASE VALVE TO BE "CRISPIN SEWER VALVE", APCO 400 SEWAGE VALVE, OR EQUAL.
2. AIR VACUUM VALVE INSTALLATION TO BE SIMILAR EXCEPT VALVE TO BE APCO 402 SEWAGE VALVE OR EQUAL.
3. 2" RELEASE LINE, GATE AND CHECK VALVE ON AIR-VACUUM VALVE ONLY.



<p>BWSC</p> <p>BARGE WAGGONER SUMNER & CANNON, INC.</p> <p>162 THIRD AVENUE NORTH, NASHVILLE, TENNESSEE 37201 PHONE: (615) 254-1500 FAX: (615) 258-6572 E-MAIL: NASHVILLE@BARGEWAGGONER.COM</p> <p>ENGINEERS ARCHITECTS PLANNERS LANDSCAPE ARCHITECTS SURVEYORS</p>	<p>AIR RELEASE VALVE SANITARY FORCE MAIN</p>	<p>DETAIL NO.: C129</p>
	<p>FRANKLIN, KENTUCKY</p>	<p>JULY 2000</p> <p>DATE ISSUED:</p> <p>DATE REVISED:</p>



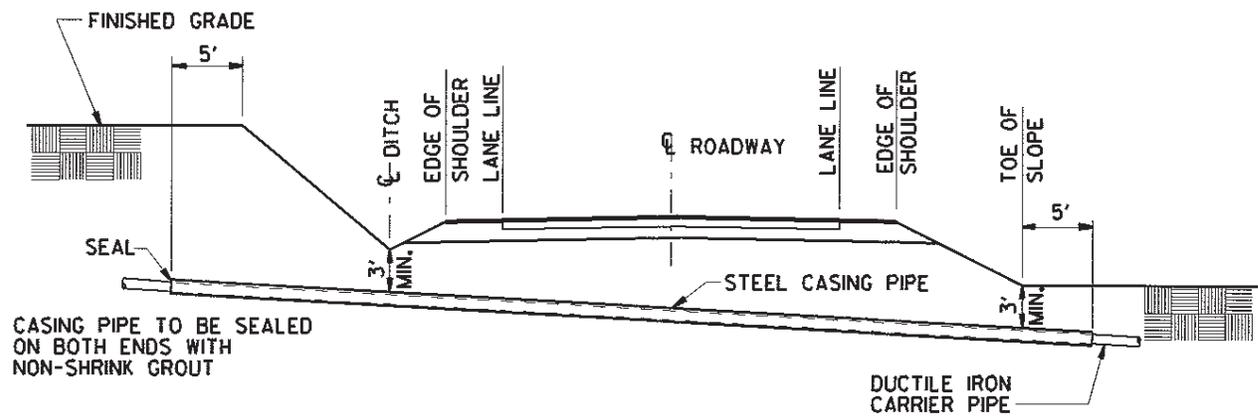
NOTE:
ENTER WALL APPROX.
1' ABOVE CHANNEL IN
FLOOR OF MANHOLE.

CLASS "A" (TDOT)
3000 PSI CONCRETE

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**STANDARD CONNECTION OF
 FORCE MAIN TO MANHOLE**
FRANKLIN, KENTUCKY

DETAIL NO.: **C135**
 JULY 2000
 DATE ISSUED:
 DATE REVISED:



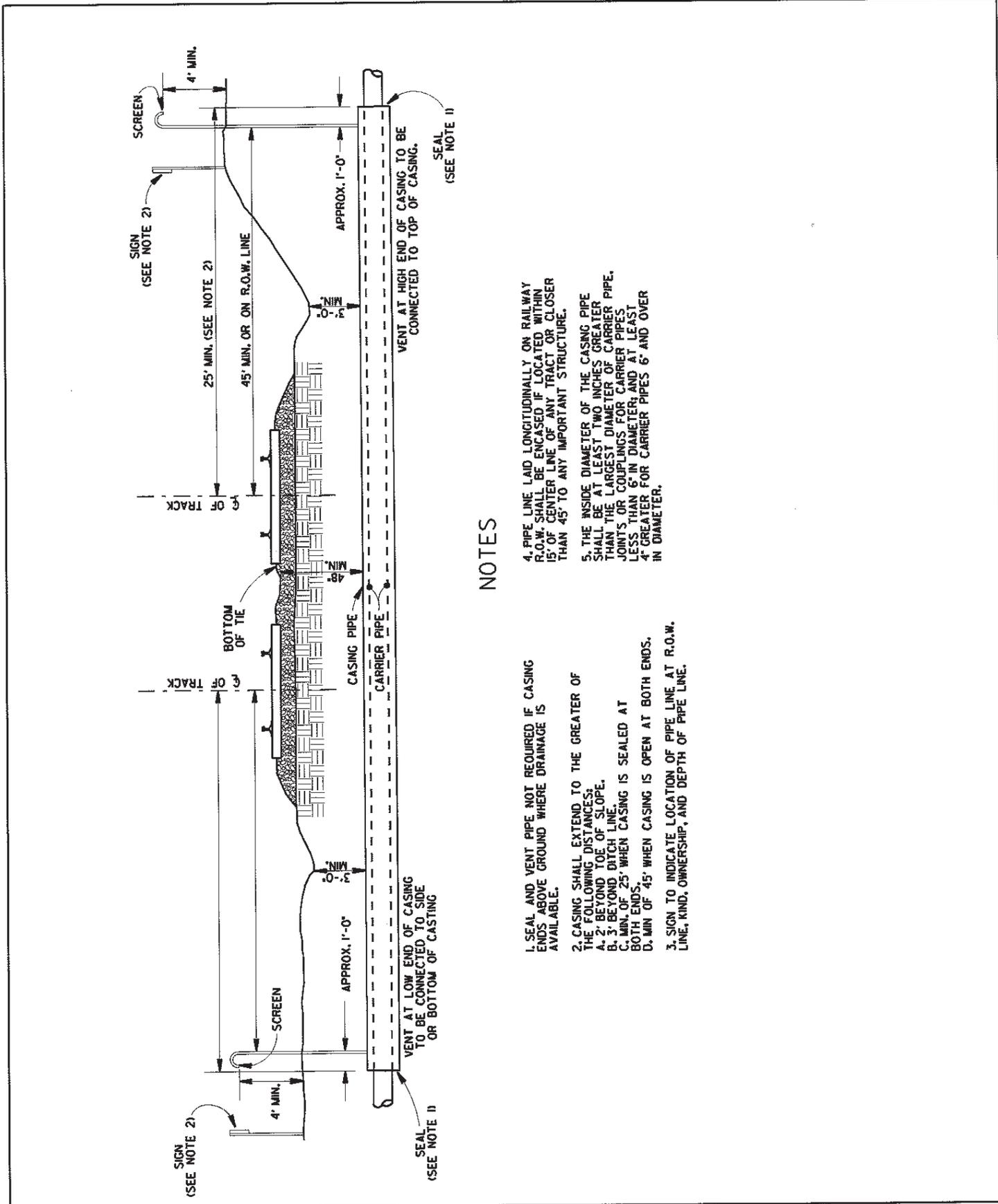
CASING PIPE TO BE SEALED ON BOTH ENDS WITH NON-SHRINK GROUT

DUCTILE IRON TO EXTEND MINIMUM OF 10' BEYOND CASING PIPE ON BOTH ENDS.

NOTES:

1. CASING SHALL EXTEND TO THE FOLLOWING DISTANCES:
 - A. 5' BEYOND TOE OF SLOPE.
 - B. 5' BEYOND BACK OF DITCH.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH "KENTUCKY TRANSPORTATION CABINET / DEPARTMENT OF HIGHWAYS STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" LATEST REVISION.

 <p>BARGE WAGGONER SUMNER & CANNON, INC.</p> <p>162 THIRD AVENUE NORTH, NASHVILLE, TENNESSEE 37201 PHONE: (615) 254-1500 FAX (615) 255-6572 E-MAIL: NASHVILLE@BARSEWAGGONER.COM</p> <p>ENGINEERS ARCHITECTS PLANNERS LANDSCAPE ARCHITECTS SURVEYORS</p>	<p>PIPE LINE CROSSING UNDER HIGHWAYS (FOR NON-FLAMABLE SUBSTANCES)</p> <p>FRANKLIN, KENTUCKY</p>	<p>DETAIL NO.: C165A</p>
		<p>DATE ISSUED: JULY 2000</p>
		<p>DATE REVISED:</p>



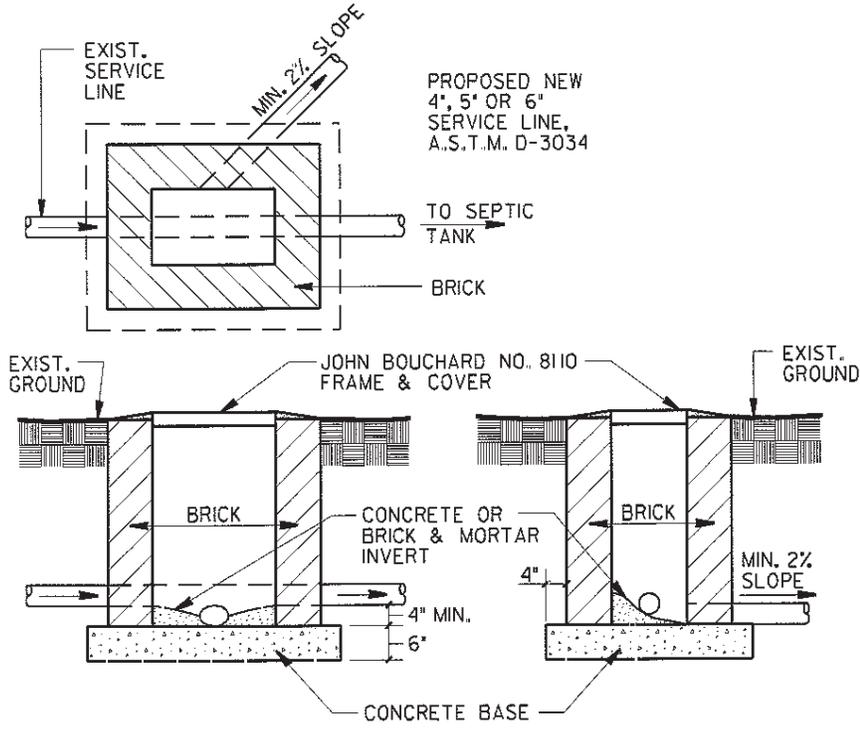
NOTES

1. SEAL AND VENT PIPE NOT REQUIRED IF CASING ENDS ABOVE GROUND WHERE DRAINAGE IS AVAILABLE.
2. CASING SHALL EXTEND TO THE GREATER OF THE FOLLOWING DISTANCES:
 - A. 2' BEYOND TOE OF SLOPE.
 - B. 3' BEYOND DITCH LINE.
 - C. MIN. OF 25' WHEN CASING IS SEALED AT BOTH ENDS.
 - D. MIN OF 45' WHEN CASING IS OPEN AT BOTH ENDS.
3. SIGN TO INDICATE LOCATION OF PIPE LINE AT R.O.W. LINE, KIND, OWNERSHIP, AND DEPTH OF PIPE LINE.
4. PIPE LINE LAID LONGITUDINALLY ON RAILWAY R.O.W. SHALL BE ENCASED IF LOCATED WITHIN 15' OF CENTER LINE OF ANY TRACT OR CLOSER THAN 45' TO ANY IMPORTANT STRUCTURE.
5. THE INSIDE DIAMETER OF THE CASING PIPE SHALL BE AT LEAST TWO INCHES GREATER THAN THE LARGEST DIAMETER OF CARRIER PIPE, JOINTS OR COUPLINGS FOR CARRIER PIPES, LESS THAN 6" IN DIAMETER; AND AT LEAST 4" GREATER FOR CARRIER PIPES 6" AND OVER IN DIAMETER.

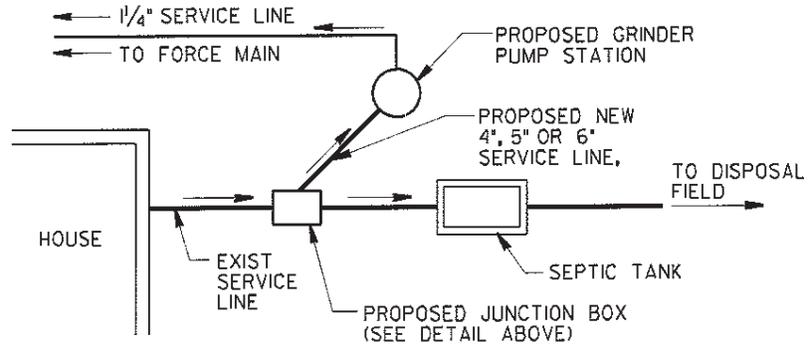
BWSC
 BARBE WAGGONER SUMNER & CANNON, INC.
 162 THIRD AVENUE NORTH, NASHVILLE, TENNESSEE 37201
 PHONE: (615) 254-1500 FAX (615) 255-8572
 E-MAIL: NASHVILLE@BARBEWAGGONER.COM
 ENGINEERS ARCHITECTS PLANNERS LANDSCAPE ARCHITECTS SURVEYORS

PIPE LINE CROSSING UNDER RAILROAD TRACKS (FOR NON-FLAMABLE SUBSTANCES)
 FRANKLIN, KENTUCKY

DETAIL NO.:	C165
DATE ISSUED:	JULY 2000
DATE REVISED:	



JUNCTION BOX



BWSC\$PLOT\$TIME\$\$\$
 BWSC\$FILE\$NAME\$\$\$

BWSC

**BARGE
WAGGONER
SUMNER &
CANNON, INC.**

162 THIRD AVENUE NORTH, NASHVILLE, TENNESSEE 37201
 PHONE: (615) 254-1500 FAX (615) 255-6572
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ENGINEERS ARCHITECTS PLANNERS LANDSCAPE ARCHITECTS SURVEYORS

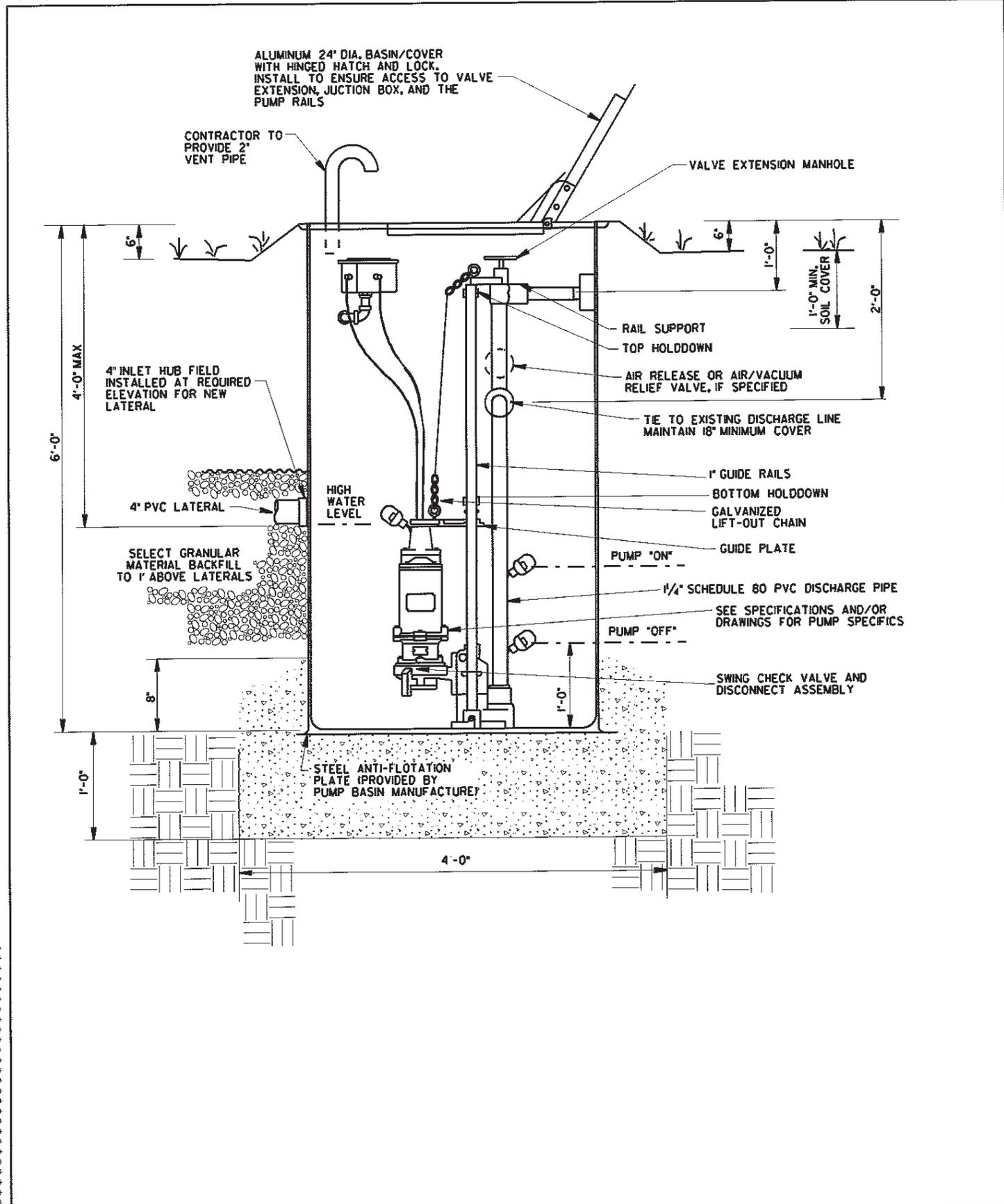
**DETAIL OF CONNECTION OF
EXISTING SEWER LINE TO
PROPOSED PUMP STATION**

FRANKLIN, KENTUCKY

DETAIL NO.: **C706**

JULY 2000
DATE ISSUED:

DATE REVISED:



BWSC\$PLOT\$TIME\$\$\$
BWSC\$FILE\$NAME\$\$\$\$\$

 <p>BWSC</p> <p>BARGE WAGGONER SUMNER & CANNON, INC.</p> <p>152 THIRD AVENUE NORTH, NASHVILLE, TENNESSEE 37201 PHONE: (615) 254-1500 FAX (615) 255-6572 E-MAIL: NASHVILLE@BARGEWAGGONER.COM</p> <p>ENGINEERS ARCHITECTS PLANNERS LANDSCAPE ARCHITECTS SURVEYORS</p>	<p>SIMPLEX GRINDER PUMP INSTALLATION</p>		<p>DETAIL NO.: C713A</p>
	<p>FRANKLIN, KENTUCKY</p>		<p>DATE ISSUED: JULY 2000</p>
			<p>DATE REVISED:</p>

N O T I C E

**DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
NATIONWIDE PERMIT AUTHORIZATION
KENTUCKY DIVISION OF WATER 401 WQC**

PROJECT: Simpson County, Item No. 3-8.32

The Section 404 activities for this project have been previously permitted under the authority of the Department of the Army Nationwide Permit No. 14 "Linear Transportation Crossings" as the project impacts are **BELOW NOTIFICATION THRESHOLDS**. Specifically all stream impacts are below 300', less than 0.10 acres and no special aquatic sites will be impacted. Impacts include:

Station 219+56 Replace a 100 linear foot long triple 8'x6' box culvert with a 128.9 linear foot 20'x10' pipe
See Sheet R25 arch. This will extend stream impacts on both sides of the roadway. It will impact **56 feet** of
Sharps Branch, a **perennial stream** with an impact area of **0.023** acres. The drainage area in
this segment is **1,830.4 acres**. **Lat 36.687395 Long -86.568491**

Station 243+90.6 Replace, move and extend a 12 inch culvert with an 18 inch reinforced concrete pipe. This will
See Sheet R35 impact **60 feet** of an U.T of Sharps Branch, an **ephemeral channel** with an impact area of **0.003**
acres. The drainage area in this segment is **12.9 acres**.
Lat 36.693622 Long -86.570349

This project involves work near and/or within Jurisdictional Waters of the United States as defined by the United States Army Corps of Engineers and therefore requires a Nationwide 14 General 404 Permit. The Division of Water certified this General Permit with several conditions (See attached). One that should be brought to your attention is regarding the use of heavy equipment in the stream channel. If there is need to cross the stream channel with heavy equipment or conduct work from within the stream channel a working platform or temporary crossing is authorized. This should be constructed with clean rock and sufficient pipe to allow stream flow to continue unimpeded (see attached typical drawing).

In order for this authorization to be valid, the attached conditions must be followed. The contractor shall post a copy of this Nationwide Approval in a conspicuous location at the project site for the duration of construction and comply with the general conditions as required.

To more readily expedite construction, the contractor may elect to alter the design or perform the work in a manner different from what was originally proposed and specified. Prior to commencing such alternative work, the contractor shall obtain **written** permission from the Division of Construction and the Division of Environmental Analysis. If such changes necessitate further permitting then the contractor will be responsible for applying to the Army Corps of Engineers and the Kentucky Division of Water

(KDOW). A copy of any request to the Corps of Engineers or the KDOW to alter this proposal and subsequent responses shall be forwarded to the Division of Environmental Analysis, DA Permit Coordinator, for office records and for informational purposes.



STEVEN L. BESHEAR
GOVERNOR

LEONARD K. PETERS
SECRETARY

ENERGY AND ENVIRONMENTAL PROTECTION CABINET

DEPARTMENT FOR ENVIRONMENTAL PROTECTION

DIVISION OF WATER

200 FAIR OAKS LANE

FRANKFORT, KENTUCKY 40601

www.kentucky.gov

**General Certification--Nationwide Permit # 14
Linear Transportation Projects**

This General Certification is issued March 19, 2012, in conformity with the requirements of Section 401 of the Clean Water Act of 1977, as amended (33 U.S.C. §1341), as well as Kentucky Statute KRS 224.16-050.

For this and all nationwide permits, the definition of surface water is as per 401 KAR 10:001 Chapter 10, Section 1(80): Surface Waters means those waters having well-defined banks and beds, either constantly or intermittently flowing; lakes and impounded waters; marshes and wetlands; and any subterranean waters flowing in well-defined channels and having a demonstrable hydrologic connection with the surface. Lagoons used for waste treatment and effluent ditches that are situated on property owned, leased, or under valid easement by a permitted discharger are not considered to be surface waters of the commonwealth.

Agricultural operations, as defined by KRS 224.71-100(1) conducting activities pursuant to KRS 224.71-100 (3), (4), (5), (6), or 10 are deemed to have certification if they are implementing an Agriculture Water Quality Plan pursuant to KRS 224.71-145.

For all other operations, the Commonwealth of Kentucky hereby certifies under Section 401 of the Clean Water Act (CWA) that it has reasonable assurances that applicable water quality standards under Kentucky Administrative Regulations Title 401, Chapter 10, established pursuant to Sections 301, 302, 304, 306 and 307 of the CWA, will not be violated for the activity covered under NATIONWIDE PERMIT 14, namely Linear Transportation Projects, provided that the following conditions are met:

1. The activity will not occur within surface waters of the Commonwealth identified by the Kentucky Division of Water as Outstanding State or National Resource Water, Cold Water Aquatic Habitat, or Exceptional Waters.
2. The activity will not occur within surface waters of the Commonwealth identified as perpetually-protected (e.g. deed restriction, conservation easement) mitigation sites.
3. The activity will impact less than 1/2 acre of wetland/marsh.
4. The activity will impact less than 300 linear feet of surface waters of the Commonwealth. Stream realignment greater than 100 feet is not covered under this general water quality certification.

**General Certification--Nationwide Permit # 14
Linear Transportation Projects
Page 2**

5. For a single and complete linear transportation project, the cumulative length of impacts less than 300 linear feet of surface waters within each Hydrologic Unit Code (HUC) 14 watershed will not exceed 500 linear feet.
6. Stream impacts covered under this General Water Quality Certification and undertaken by those persons defined as an agricultural operation under the Agricultural Water Quality Act must be completed in compliance with the Kentucky Agricultural Water Quality Plan (KWQP).
7. The Kentucky Division of Water may require submission of a formal application for an individual certification for any project if the project has been determined to likely have a significant adverse effect upon water quality or degrade the waters of the Commonwealth so that existing uses of the water body or downstream waters are precluded.
8. Activities that do not meet the conditions of this General Water Quality Certification require an Individual Section 401 Water Quality Certification.
9. Activities qualifying for coverage under this General Water Quality Certification are subject to the following conditions:
 - Erosion and sedimentation pollution control plans and Best Management Practices must be designed, installed, and maintained in effective operating condition at all times during construction activities so that violations of state water quality standards do not occur (401 KAR 10:031 Section 2 and KRS 224.70-100).
 - Sediment and erosion control measures, such as check-dams constructed of any material, silt fencing, hay bales, etc., shall not be placed within surface waters of the Commonwealth, either temporarily or permanently, without prior approval by the Kentucky Division of Water's Water Quality Certification Section. If placement of sediment and erosion control measures in surface waters is unavoidable, design and placement of temporary erosion control measures shall not be conducted in such a manner that may result in instability of streams that are adjacent to, upstream, or downstream of the structures. All sediment and erosion control devices shall be removed and the natural grade restored within the completion timeline of the activities.
 - Measures shall be taken to prevent or control spills of fuels, lubricants, or other toxic materials used in construction from entering the watercourse.
 - Removal of riparian vegetation in the utility line right-of-way shall be limited to that necessary for equipment access.
 - To the maximum extent practicable, all in-stream work under this certification shall be performed under low-flow conditions.

General Certification--Nationwide Permit # 14
Linear Transportation Projects
Page 2

- Heavy equipment, e.g. bulldozers, backhoes, draglines, etc., if required for this project, should not be used or operated within the stream channel. In those instances in which such in-stream work is unavoidable, then it shall be performed in such a manner and duration as to minimize turbidity and disturbance to substrates and bank or riparian vegetation.
- Any fill shall be of such composition that it will not adversely affect the biological, chemical, or physical properties of the receiving waters and/or cause violations of water quality standards. If rip-rap is utilized, it should be of such weight and size that bank stress or slump conditions will not be created because of its placement.
- If there are water supply intakes located downstream that may be affected by increased turbidity and suspended solids, the permittee shall notify the operator when such work will be done.
- Should evidence of stream pollution or jurisdictional wetland impairment and/or violations of water quality standards occur as a result of this activity (either from a spill or other forms of water pollution), the KDOW shall be notified immediately by calling (800) 928-2380.

Non-compliance with the conditions of this general certification or violation of Kentucky state water quality standards may result in civil penalties.

KENTUCKY REGIONAL GENERAL CONDITIONS

These regional conditions are in addition to, but do not supersede, the requirements in the Federal Register (Volume 77 No. 34 of February 21, 2012)

Notifications for all Nationwide Permits (NWP) shall be in accordance with General Condition No. 31.

1. For activities that would result in a loss of Outstanding State or National Resource Waters (OSNRWs), Exceptional Waters (EWs), Coldwater Aquatic Habitat Waters (CAHs) and waters with Designated Critical Habitat (DCH) under the Endangered Species Act for the NWP listed below, a Pre-Construction Notification (PCN) will be required to the Corps. The Corps will coordinate with the appropriate resource agencies (see attached list) on these NWP for impacts to these waters.

NWP 3 (Maintenance)

NWP 7 (Outfall Structures and Associated Intake Structures)

NWP 12 (Utility Line Activities)

NWP 14 (Linear Transportation Projects)

NWP 29 (Residential Developments)

NWP 39 (Commercial and Institutional Developments)

NWP 40 (Agricultural Activities)

NWP 41 (Reshaping Existing Drainage Ditches)

NWP 42 (Recreational Facilities)

NWP 43 (Stormwater Management Facilities)

NWP 44 (Mining Activities)

NWP 51 (Land-Based Renewable Energy Generation Facilities)

NWP 52 (Water-Based Renewable Energy Generation Pilot Projects)

2. In addition to the notification and agency coordination requirements in the NWP, for impacts greater than 0.25 acres in all "waters of the U.S." for the NWP listed below, a PCN will be required to the Corps. The Corps will coordinate with the appropriate resource agencies (see attached list) on these NWP:

NWP 3 (Maintenance)

NWP 7 (Outfall Structures and Associated Intake Structures)

NWP 12 (Utility Line Activities)

NWP 14 (Linear Transportation Projects)

NWP 29 (Residential Developments)

NWP 39 (Commercial and Institutional Developments)

NWP 40 (Agricultural Activities)

NWP 41 (Reshaping Existing Drainage Ditches)

NWP 42 (Recreational Facilities)

NWP 43 (Stormwater Management Facilities)

NWP 44 (Mining Activities)

NWP 51 (Land-Based Renewable Energy Generation Facilities)

NWP 52 (Water-Based Renewable Energy Generation Pilot Projects)

3. For activities in all “waters of the U.S.” for the NWP’s listed below, a PCN will be required to the Corps. The Corps will coordinate with the appropriate resource agencies (see attached list) on these NWP’s:

NWP 21 (Surface Coal Mining Activities)

NWP 27 (Aquatic Habitat Restoration, Establishment & Enhancement Activities)

NWP 49 (Coal Remining Activities)

NWP 50 (Underground Coal Mining Activities)

4. Nationwide Permit No. 14 – Linear Transportation Projects.

(a) Activities in Section 10 navigable waters will require a PCN to the Corps.

(b) New public road alignments or realignments are limited to a permanent loss of 500 linear feet of intermittent or perennial stream length at each crossing. Public road crossings with permanent losses greater than 500 linear feet of intermittent or perennial stream associated with new alignments or realignments will be evaluated as an individual permit i.e., a Letter of Permission or as a Standard Individual Permit.

(c) All linear transportation project crossings resulting in the permanent loss of greater than 300 linear feet of intermittent or perennial stream will require mitigation to compensate for impacts to the “waters of the U.S.” The permanent loss of “waters of the U.S.” includes the linear feet of water that is permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity and not restored to pre-construction contours and elevations after construction. In addition to the notification requirements contained in NWP 14, the permittee must submit a PCN to the district engineer prior to commencing the activity for the permanent loss of greater than 300 feet of intermittent and perennial stream of all “waters of the U.S.” (See General Condition 31 and the definition of “loss of waters of the United States” in the Nationwide Permits for further information.)

Further information:

Outstanding State or National Resource Water (OSNRWs), Exceptional Waters (EWs), and Coldwater Aquatic Habitat Waters (CAHs) are waters designated by the Commonwealth of Kentucky, Natural Resources and Environmental Protection Cabinet. The list can be found at the following link: <http://epccapp.ky.gov/spwaters/>

Designated Critical Habitat (DCH) under the Endangered Species Act is determined within the Commonwealth of Kentucky by the U.S. Fish and Wildlife Service. The current list of Kentucky’s Threatened, Endangered, and Federal Candidate Species can be found at the following link: <http://www.fws.gov/frankfort/EndangeredSpecies.html>

Information on Pre-Construction Notification (PCN) can be found at NWP General Condition No. 31 (Federal Register, Volume 77, No. 34, Tuesday, February 21, 2012, pp 10286-10288). Mitigation includes activities that avoid, minimize, and compensate for impacts.

COORDINATING RESOURCE AGENCIES

Chief, Wetlands Regulatory Section
U.S. Environmental Protection Agency
Region IV

Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303

Supervisor
U.S. Fish & Wildlife Service
JC Watts Federal Building, Room 265
330 West Broadway
Frankfort, Kentucky 40601

Supervisor
401 Water Quality Certification
Kentucky Division of Water
200 Fair Oaks Lane, 4th Floor
Frankfort, Kentucky 40601

Commissioner
Department of Fish and Wildlife Resources
#1 Game Farm Road
Frankfort, Kentucky 40601
Executive Director and State Historic Preservation Officer
Kentucky Heritage Council
300 Washington Street
Frankfort, Kentucky 40601

**ADDITIONAL COORDINATING RESOURCE AGENCY
FOR NWPS 21, 49, AND 50**

Kentucky Department of Natural Resources
Division of Mine Permits
#2 Hudson Hollow
Frankfort, Kentucky 40601



US Army Corps of Engineers

Nationwide Permit No. 14, Linear Transportation Projects

Activities required for the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxiways) in waters of the United States.

- a. For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge cannot cause the loss of greater than 1/3-acre of waters of the United States.
- b. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project.
- c. This NWP also authorizes temporary structures, fills, and work necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.
- d. This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) the loss of waters of the United States exceeds 1/10-acre; or (2) there is a discharge in a special aquatic site, including wetlands. (See general condition 31.) (Sections 10 and 404)

Note: Some discharges for the construction of farm roads or forest roads, or temporary roads for moving mining equipment, may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4).

Valid from March 19, 2012 through March 18, 2017

Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR §§ 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR § 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

1. **Navigation.** (a) No activity may cause more than a minimal adverse effect on navigation.
(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.
(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.
2. **Aquatic Life Movements.** No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species.
3. **Spawning Areas.** Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.
4. **Migratory Bird Breeding Areas.** Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.
5. **Shellfish Beds.** No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.
6. **Suitable Material.** No activity may use unsuitable material (e.g., trash, debris, car

bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River

designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).

17. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

18. Endangered Species. (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address ESA compliance for the NWP activity, or whether additional ESA consultation is necessary.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that might be affected by the proposed work or that utilize the designated critical habitat that might be affected by the proposed work. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NWPs.

(e) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. FWS or the NMFS, The Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. FWS and NMFS or their world wide web pages at <http://www.fws.gov/> or <http://www.fws.gov/ipac> and <http://www.noaa.gov/fisheries.html> respectively.

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for obtaining any “take” permits required under the U.S. Fish and Wildlife Service’s regulations governing compliance with the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act. The permittee should contact the appropriate local office of the U.S. Fish and Wildlife Service to determine if such “take” permits are required for a particular activity.

20. Historic Properties. (a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address section 106 compliance for the NWP activity, or whether additional section 106 consultation is necessary.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of Section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties on which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed.

(d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR §800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must

still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 31, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal, and provides a project-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in minimal adverse effects on the aquatic environment.

(2) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered.

(3) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) – (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).

(4) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.

(5) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream rehabilitation, enhancement, or preservation, to ensure that the activity results in minimal adverse effects on the aquatic environment.

(e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the restoration or establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist

of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to establish a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or establishing a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(g) Permittees may propose the use of mitigation banks, in-lieu fee programs, or separate permittee-responsible mitigation. For activities resulting in the loss of marine or estuarine resources, permittee-responsible compensatory mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with

any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

“When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”

(Transferee)

(Date)

30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

- (a) A statement that the authorized work was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;
- (b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and
- (c) The signature of the permittee certifying the completion of the work and mitigation.

31. Pre-Construction Notification. (a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 20 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed project;

(3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause, including the anticipated amount of loss of water of the United States expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative

description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(4) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(5) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse effects are minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and

(7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

(c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

(d) Agency Coordination: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWP's and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

(2) For all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States, for NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300 linear feet of intermittent and ephemeral stream bed, and for all NWP 48 activities that require pre-construction notification, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments.

The comments must explain why the agency believes the adverse effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWP, including the need for mitigation to ensure the net adverse environmental effects to the aquatic environment of the proposed activity are minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(4) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

D. District Engineer's Decision

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. For a linear project, this determination will include an evaluation of the individual crossings to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings authorized by NWP. If an applicant requests a waiver of the 300 linear foot limit on impacts to intermittent or ephemeral streams or of an otherwise applicable limit, as provided for in NWPs 13, 21, 29, 36, 39, 40, 42, 43, 44, 50, 51 or 52, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in minimal adverse effects. When making minimal effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.

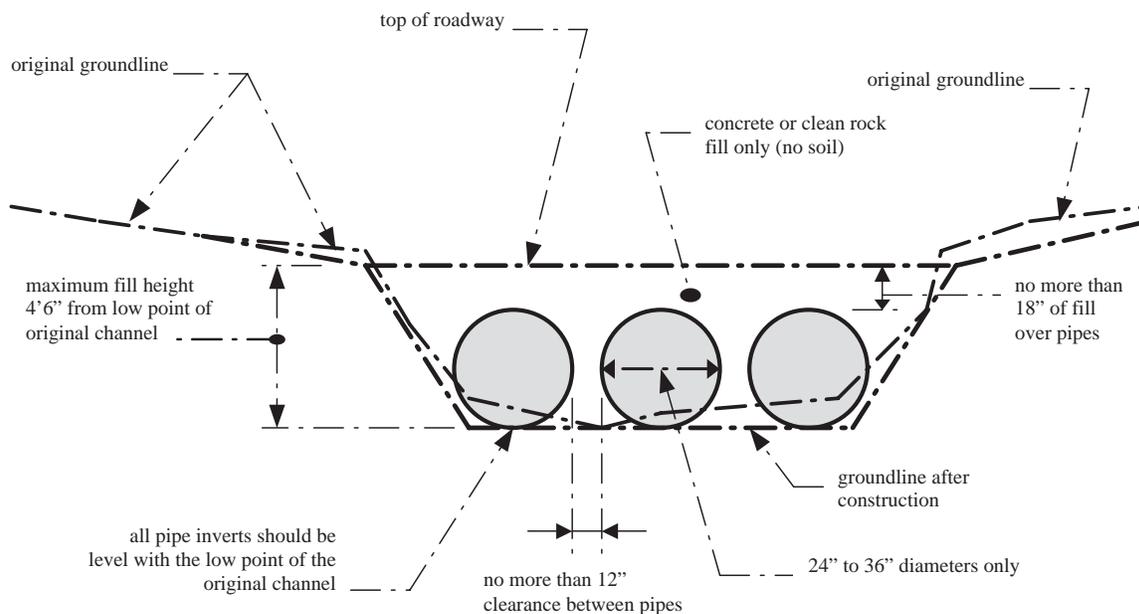
2. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for projects with smaller impacts. The district engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed activity are minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the district engineer will notify the permittee and include any activity-specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the district engineer to be minimal, the district engineer will provide a timely written response to the applicant. The response will state that the project can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

3. If the district engineer determines that the adverse effects of the proposed work are more than minimal, then the district engineer will notify the applicant either: (a) that the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the project is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level; or (c) that the project is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse effects occur to the aquatic environment, the activity will be authorized within the 45-day PCN period, with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation or a requirement that the applicant submit a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level. When mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.

E. Further Information

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.
3. NWPs do not grant any property rights or exclusive privileges.
4. NWPs do not authorize any injury to the property or rights of others.
5. NWPs do not authorize interference with any existing or proposed Federal project.

ATTACHMENT 1



NOTES:

1. This is a conceptual drawing. The number and size of pipes and other details will vary depending on specific site conditions.
2. The pipes and backfill must be contained within the stream channel as shown above. During the construction of the approaches and access roadway across the floodplain, unstable and unconsolidated materials unsuitable for roadways may be excavated and replaced with riprap, crushed stone, or other stable road construction materials. This may only be done, however, with the following provisions: (1) the disposal of excess, unconsolidated materials thus excavated must be outside of the floodplain and (2) the finished surface of the completed road may be no more than three inches (3") above the pre-construction surface of the floodplain at any point beyond the top of banks.

LOW-WATER CROSSING

STANDARD DRAWING
Not to Scale



STEVEN L. BESHEAR
GOVERNOR

LEONARD K. PETERS
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE, 4TH FLOOR
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

July 15, 2014

Gina Renee Slaughter
US 31 - Simpson Co
District 3 KY Dept. of Highways KYTC
900 Morgantown Road
Bowling Green, KY 42102

Re: KYR10 Coverage Acknowledgment
KPDES No.: KYR10I536
Widening of US31W
Permit Type: Construction
AI ID: 6442
Simpson County, Kentucky

Dear **Gina Renee Slaughter**:

The discharges associated with the Notice of Intent you submitted have been approved for coverage under the "Kentucky Pollutant Discharge Elimination System (KPDES) General Permit for Stormwater Discharges Associated with Construction Activities (KYR10)" permit. This coverage becomes effective the date of this correspondence and will remain effective until the general permit expires or the Division of Water revokes coverage. During this period of coverage all discharges shall comply with the conditions of the applicable general permit. A copy of the general permit the operator is now covered by can be found on our website: <http://water.ky.gov>.

Any questions concerning the general permit and its requirements should be directed to me at (502) 564-3410.

Facility Site: -86.558306, 36.671299

Sincerely,

A handwritten signature in black ink, appearing to read "Shawn Hokanson".

Shawn Hokanson
Surface Water Permits Branch
Division of Water

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



Kentucky Transportation Cabinet

Highway District 3 (1)

And

_____ **(2), Construction**

Kentucky Pollutant Discharge Elimination System

Permit KYR10

Best Management Practices (BMP) plan

Groundwater protection plan

For Highway Construction Activities

For

Item No. 3-8.32

US31W Widening

Simpson County

Project: PCN ## - ##### (2)

KyTC BMP Plan for Project PCN ## -

Project information

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

1. Owner – Kentucky Transportation Cabinet, **District 3(1)**
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) **US 31W Franklin, KY 42134**
6. Latitude/Longitude (project mid-point) **36° 41' 16" N; -86° 34' 07" W (1)**
7. County **Simpson (1)**
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: **Widening US31W from Wal-Mart south to I-65.**
2. Order of major soil disturbing activities **(2) and (3)**
3. Projected volume of material to be moved **Embankment 53,858 Cubic Yards & Excavation 42,476 Cubic Yards (1)**
4. Estimate of total project area **25.37 acres (1)**
5. Estimate of area to be disturbed **25.37 acres (1)**
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.(1)**
7. Data describing existing soil condition **Mountview Silt Loam 2 to 6% slope. This soil is deep, well drained and gently sloping. It's has a low strength. Baxter cherty silt loam 6 to12% slopes is a deep, sloping, well drained soil on rolling uplands that are dotted with many sinks and depressions and on side slopes. (1) & (2)**
8. Data describing existing discharge water quality **average (1) & (2)**
9. Receiving water name **Sharps Branch to West Fork of Drakes Creek (1)**
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.

KyTC BMP Plan for Project PCN ## -

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)

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.

KyTC BMP Plan for Project PCN ## -

- 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.
- 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

KyTC BMP Plan for Project PCN ## -

- 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.
 - 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: **NONE**

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.

KyTC BMP Plan for Project PCN ## -

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:**

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

KyTC BMP Plan for Project PCN ## -

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.

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.

KyTC BMP Plan for Project PCN ## -

- 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.
- 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. N/A (1)

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.

KyTC BMP Plan for Project PCN ## -

F. Inspections

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

- 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 received KyTC Grade Level II training or other qualification as prescribed by the cabinet that includes instruction concerning sediment and erosion control.
- 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

KyTC BMP Plan for Project PCN ## -

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).
- 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);

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

_____ 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.

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.)

**KENTUCKY TRANSPORTATION CABINET
COMMUNICATION ALL PROMISES (CAP)**

Item Number
03-0008.32

County
SIMPSON

Route
US 31

Project Manager
kytcl david.erickson

CAP #	Date of Promise	Requestor	Location of Promise:	CAP Description
1	5/6/13	Equity Group (Parcel 71)	Parcel 71	<p>A. NO EASEMENT FROM THE EQUITY GROUP CAN BE USED AS A STAGING AREA OR TO STORE EQUIPMENT.</p> <p>B. ANY AND ALL PERSONAL PROPERTY OF THE EQUITY GROUP WILL BE RESTORED TO ITS PRIOR CONDITION UPON COMPLETION OF THE ROAD PROJECT.</p>
2	5/6/13	Equity Group (Parcel 71)	Parcel 71	<p>A. THE CONSTRUCTION OF THE ENTRANCE AT STA. 184+00 WILL OCCUR BETWEEN 3PM FRIDAY AFTERNOON AND WILL BE COMPLETED BY THE FOLLOWING 6AM MONDAY MORNING AND NOT DURING THE MONTH OF SEPTEMBER. IF AT ALL POSSIBLE THE REMAINING ENTRANCES WILL BE PAVED ONE HALF AT A TIME SO THAT THEY MAY STILL BE USED AT ALL TIMES.</p> <p>B. THE ENTRANCE AT STATION NUMBER 183+76.5 WILL BE TIED BACK IN BEFORE WE REACH THE CONCRETE SECTION. THE OVERLAY WILL END AT THE SAME LOCATION AS THE BLACKTOP CURRENTLY ENDS NOW. NO CONCRETE WILL BE DISTURBED OR REPLACED BY THE ROAD CONTACTOR. THERE IS NO WARRANTY ASSOCIATED WITH THE ENTRANCE.</p> <p>C. THE CONTRACTOR WILL ADVISE COMPLEX MANAGER TIM KNIGHT (270) 647-0355 AT LEAST ONE WEEK PRIOR TO THE CLOSURE OR PARTIAL CLOSURE OF ANY OF THEIR ENTRANCES.</p>
3	5/6/13	Equity Group (Parcel 71)	Parcel 71	<p>A. ANY FENCING LOCATED WITHIN THE FEE SIMPLE AND TEMPORARY EASEMENT ACQUISITION AREAS WILL BE REPLACED WITH LIKE MATERIALS AS A COMPONENT OF THE CONSTRUCTION PROJECT AT KYTC'S SOLE EXPENSE AND</p> <p>B. TEMPORARY FENCING WILL BE INSTALLED AS NEEDED AT KYTC'S EXPENSE TO INSURE FULL UTILITY OF THE PROPERTY DURING CONSTRUCTION DISTURBANCE PERIODS.</p> <p>C. THE CONTRACTOR IS TO REPLACE FENCE IN-KIND (1,869 FEET OF 6-FOOT TALL CHAIN LINK 9-GAUGE WITH BARB, 3-INCH DIAMETER TERMINAL POST, 2-INCH DIAMETER LINE POST AT APPROXIMATELY 10-FOOT SPACING, 1 5/8-INCH DIAMETER TOP RAIL FOR PERMANENT INSTALLATION). DURING CONSTRUCTION, REPLACE FENCE TEMPORARILY OUTSIDE TEMPORARY EASEMENT (1,173 FEET OF 6-FOOT TALL CHAIN LINK 11 1/2 GAUGE NO BARB, 3-INCH DIAMETER TERMINAL POST, 2-INCH DIAMETER LINE POST AT APPROXIMATELY 10-FOOT SPACING, 1 5/8-INCH DIAMETER TOP RAIL FOR TEMPORARY INSTALLATION). TOP RAIL OF FENCE TO FOLLOW GROUND. AS DIRECTED BY ENGINEER.</p>

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 2012 with the 2012 Revision*.

**Supplemental Specifications to the
Standard Specifications for Road and Bridge Construction, 2012 Edition
Effective with the July 31, 2015 Letting**

Subsection:	102.15 Process Agent.
Revision:	Replace the 1st paragraph with the following: Every corporation doing business with the Department shall submit evidence of compliance with KRS Sections 14A.4-010, 271B.11-010, 271B.11-070, 271B.11-080, 271B.5-010 and 271B.16-220, and file with the Department the name and address of the process agent upon whom process may be served.
Subsection:	105.13 Claims Resolution Process.
Revision:	Delete all references to TC 63-34 and TC 63-44 from the subsection as these forms are no longer available through the forms library and are forms generated within the AASHTO SiteManager software.
Subsection:	108.03 Preconstruction Conference.
Revision:	Replace 8) Staking with the following: 8) Staking (designated by a Professional Engineer or Land Surveyor licensed in the Commonwealth of Kentucky.
Subsection:	109.07.02 Fuel.
Revision:	Revise item Crushed Aggregate Used for Embankment Stabilization to the following: Crushed Aggregate Used for Stabilization of Unsuitable Materials Used for Embankment Stabilization
	Delete the following item from the table. Crushed Sandstone Base (Cement Treated)
Subsection:	110.02 Demobilization.
Revision:	Replace the first part of the first sentence of the second paragraph with the following: Perform all work and operations necessary to accomplish final clean-up as specified in the first paragraph of Subsection 105.12;
Subsection:	112.03.12 Project Traffic Coordinator (PTC).
Revision:	Replace the last paragraph of this subsection with the following: Ensure the designated PTC has sufficient skill and experience to properly perform the task assigned and has successfully completed the qualification courses.
Subsection:	112.04.18 Diversions (By-Pass Detours).
Revision:	Insert the following sentence after the 2nd sentence of this subsection. The Department will not measure temporary drainage structures for payment when the contract documents provide the required drainage opening that must be maintained with the diversion. The temporary drainage structures shall be incidental to the construction of the diversion. If the contract documents fail to provide the required drainage opening needed for the diversion, the cost of the temporary drainage structure will be handled as extra work in accordance with section 109.04.
Subsection:	201.03.01 Contractor Staking.
Revision:	Replace the first paragraph with the following: Perform all necessary surveying under the general supervision of a Professional Engineer or Land Surveyor licensed in the Commonwealth of Kentucky.

**Supplemental Specifications to the
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Subsection:	201.04.01 Contractor Staking.
Revision:	Replace the last sentence of the paragraph with the following: Complete the general layout of the project under the supervision of a Professional Engineer or Land Surveyor licensed in the Commonwealth of Kentucky.
Subsection:	206.04.01 Embankment-in-Place.
Revision:	Replace the fourth paragraph with the following: The Department will not measure suitable excavation included in the original plans that is disposed of for payment and will consider it incidental to Embankment-in-Place.
Subsection:	208.02.01 Cement.
Revision:	Replace paragraph with the following: Select Type I or Type II cement conforming to Section 801. Use the same type cement throughout the work.
Subsection:	208.03.06 Curing and Protection.
Revision:	Replace the fourth paragraph with the following: Do not allow traffic or equipment on the finished surface until the stabilized subgrade has cured for a total of 7-days with an ambient air temperature above 40 degrees Fahrenheit. A curing day consists of a continuous 24-hour period in which the ambient air temperature does not fall below 40 degrees Fahrenheit. Curing days will not be calculated consecutively, but must total seven (7) , 24-hour days with the ambient air temperature remaining at or above 40 degrees Fahrenheit before traffic or equipment will be allowed to traverse the stabilized subgrade. The Department may allow a shortened curing period when the Contractor requests. The Contractor shall give the Department at least 3 day notice of the request for a shortened curing period. The Department will require a minimum of 3 curing days after final compaction. The Contractor shall furnish cores to the treated depth of the roadbed at 500 feet intervals for each lane when a shortened curing time is requested. The Department will test cores using an unconfined compression test. Roadbed cores must achieve a minimum strength requirement of 80 psi.
Subsection:	208.03.06 Curing and Protection.
Revision:	Replace paragraph eight with the following: At no expense to the Department, repair any damage to the subgrade caused by freezing.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	A) Seed Mixtures for Permanent Seeding.
Revision:	Revise Seed Mix Type I to the mixture shown below: 50% Kentucky 31 Tall Fescue (Festuca arundinacea) 35% Hard Fescue (Festuca (Festuca longifolia) 10% Ryegrass, Perennial (Lolium perenne) 5% White Dutch Clover (Trifolium repens)
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	A) Seed Mixtures for Permanent Seeding.
Number:	2)
Revision:	Replace the paragraph with the following: Permanent Seeding on Slopes Greater than 3:1 in Highway Districts 4, 5, 6, and 7. Apply seed mix Type II at a minimum application rate of 100 pounds per acre. If adjacent to a golf course replace the crown vetch with Kentucky 31 Tall Fescue.

**Supplemental Specifications to the
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Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	A) Seed Mixtures for Permanent Seeding.
Number:	3)
Revision:	Replace the paragraph with the following: Permanent Seeding on Slopes Greater than 3:1 in Highway Districts 1, 2, 3, 8, 9, 10, 11, and 12. Apply seed mix Type III at a minimum application rate of 100 pounds per acre. If adjacent to crop land or golf course, replace the Sericea Lespedeza with Kentucky 31 Fescue.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	B) Procedures for Permanent Seeding.
Revision:	Delete the first sentence of the section.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	B) Procedures for Permanent Seeding.
Revision:	Replace the second and third sentence of the section with the following: Prepare a seedbed and apply an initial fertilizer that contains a minimum of 100 pounds of nitrogen, 100 pounds of phosphate, and 100 pounds of potash per acre. Apply agricultural limestone to the seedbed when the Engineer determines it is needed. When required, place agricultural limestone at a rate of 3 tons per acre.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	D) Top Dressing.
Revision:	Change the title of part to D) Fertilizer.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	D) Fertilizer.
Revision:	Replace the first paragraph with the following: Apply fertilizer at the beginning of the seeding operation and after vegetation is established. Use fertilizer delivered to the project in bags or bulk. Apply initial fertilizer to all areas prior to the seeding or sodding operation at the application rate specified in 212.03.03 B). Apply 20-10-10 fertilizer to the areas after vegetation has been established at a rate of 11.5 pounds per 1,000 square feet. Obtain approval from the Engineer prior to the 2nd fertilizer application. Reapply fertilizer to any area that has a streaked appearance. The reapplication shall be at no additional cost to the Department. Re-establish any vegetation severely damaged or destroyed because of an excessive application of fertilizer at no cost to the Department.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	D) Fertilizer.
Revision:	Delete the second paragraph.
Subsection:	212.04.04 Agricultural Limestone.
Revision:	Replace the entire section with the following: The Department will measure the quantity of agricultural limestone in tons.
Subsection:	212.04.05 Fertilizer.
Revision:	Replace the entire section with the following: The Department will measure fertilizer used in the seeding or sodding operations for payment. The Department will measure the quantity by tons.

**Supplemental Specifications to the
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Subsection:	212.05 PAYMENT.												
Revision:	Delete the following item code:												
	<table border="1"> <thead> <tr> <th><u>Code</u></th> <th><u>Pay Item</u></th> <th><u>Pay Unit</u></th> </tr> </thead> <tbody> <tr> <td>05966</td> <td>Topdressing Fertilizer</td> <td>Ton</td> </tr> </tbody> </table>	<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>	05966	Topdressing Fertilizer	Ton						
<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>											
05966	Topdressing Fertilizer	Ton											
Subsection:	212.05 PAYMENT.												
Revision:	Add the following pay items:												
	<table border="1"> <thead> <tr> <th><u>Code</u></th> <th><u>Pay Item</u></th> <th><u>Pay Unit</u></th> </tr> </thead> <tbody> <tr> <td>05963</td> <td>Initial Fertilizer</td> <td>Ton</td> </tr> <tr> <td>05964</td> <td>20-10-10 Fertilizer</td> <td>Ton</td> </tr> <tr> <td>05992</td> <td>Agricultural Limestone</td> <td>Ton</td> </tr> </tbody> </table>	<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>	05963	Initial Fertilizer	Ton	05964	20-10-10 Fertilizer	Ton	05992	Agricultural Limestone	Ton
<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>											
05963	Initial Fertilizer	Ton											
05964	20-10-10 Fertilizer	Ton											
05992	Agricultural Limestone	Ton											
Subsection:	213.03.02 Progress Requirements.												
Revision:	Replace the last sentence of the third paragraph with the following: Additionally, the Department will apply a penalty equal to the liquidated damages when all aspects of work are not coordinated in an acceptable manner within 7 calendar days after written notification.												
Subsection:	213.03.05 Temporary Control Measures.												
Part:	E) Temporary Seeding and Protection.												
Revision:	Delete the second sentence of the first paragraph.												
Subsection:	304.02.01 Physical Properties.												
Table:	Required Geogrid Properties												
Revision:	Replace all references to Test Method "GRI-GG2-87" with ASTM D 7737.												
Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.												
Part:	B) Sampling.												
Revision:	Replace the second sentence with the following: The Department will determine when to obtain the quality control samples using the random-number feature of the mix design submittal and approval spreadsheet. The Department will randomly determine when to obtain the verification samples required in Subsections 402.03.03 and 402.03.04 using the Asphalt Mixture Sample Random Tonnage Generator.												
Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.												
Part:	D) Testing Responsibilities.												
Number:	3) VMA.												
Revision:	Add the following paragraph below Number 3) VMA: Retain the AV/VMA specimens and one additional corresponding G _{mm} sample for 5 working days for mixture verification testing by the Department. For Specialty Mixtures, retain a mixture sample for 5 working days for mixture verification testing by the Department. When the Department's test results do not verify that the Contractor's quality control test results are within the acceptable tolerances according to Subsection 402.03.03, retain the samples and specimens from the affected subplot(s) for the duration of the project.												
Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.												
Part:	D) Testing Responsibilities.												
Number:	4) Density.												
Revision:	Replace the second sentence of the Option A paragraph with the following: Perform coring by the end of the following work day.												

**Supplemental Specifications to the
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Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.
Part:	D) Testing Responsibilities.
Number:	5) Gradation.
Revision:	Delete the second paragraph.
Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.
Part:	H) Unsatisfactory Work.
Number:	1) Based on Lab Data.
Revision:	Replace the second paragraph with the following: When the Engineer determines that safety concerns or other considerations prohibit an immediate shutdown, continue work and the Department will make an evaluation of acceptability according to Subsection 402.03.05.
Subsection:	402.03.03 Verification.
Revision:	Replace the first paragraph with the following: 402.03.03 Mixture Verification. For volumetric properties, the Department will perform a minimum of one verification test for AC, AV, and VMA according to the corresponding procedures as given in Subsection 402.03.02. The Department will randomly determine when to obtain the verification sample using the Asphalt Mixture Sample Random Tonnage Generator. For specialty mixtures, the Department will perform one AC and one gradation determination per lot according to the corresponding procedures as given in Subsection 402.03.02. However, Department personnel will not perform AC determinations according to KM 64-405. The Contractor will obtain a quality control sample at the same time the Department obtains the mixture verification sample and perform testing according to the procedures given in Subsection 402.03.02. If the Contractor's quality control sample is verified by the Department's test results within the tolerances provided below, the Contractor's sample will serve as the quality control sample for the affected subplot. The Department may perform the mixture verification test on the Contractor's equipment or on the Department's equipment.
Subsection:	402.03.03 Verification.
Part:	A) Evaluation of Subplot(s) Verified by Department.
Revision:	Replace the third sentence of the second paragraph with the following: When the paired <i>t</i> -test indicates that the Contractor's data and Department's data are possibly not from the same population, the Department will investigate the cause for the difference according to Subsection 402.03.05 and implement corrective measures as the Engineer deems appropriate.
Subsection:	402.03.03 Verification.
Part:	B) Evaluation of Subplots Not Verified by Department.
Revision:	Replace the third sentence of the first paragraph with the following: When differences between test results are not within the tolerances listed below, the Department will resolve the discrepancy according to Subsection 402.03.05.

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Subsection:	402.03.03 Verification.
Part:	B) Evaluation of Sublots Not Verified by Department.
Revision:	Replace the third sentence of the second paragraph with the following: When the <i>F</i> -test or <i>t</i> -test indicates that the Contractor's data and Department's data are possibly not from the same population, the Department will investigate the cause for the difference according to Subsection 402.03.05 and implement corrective measures as the Engineer deems appropriate.
Subsection:	402.03.03 Verification.
Part:	C) Test Data Patterns.
Revision:	Replace the second sentence with the following: When patterns indicate substantial differences between the verified and non-verified sublots, the Department will perform further comparative testing according to subsection 402.03.05.
Subsection:	402.03 CONSTRUCTION.
Revision:	Add the following subsection: 402.03.04 Testing Equipment and Technician Verification. For mixtures with a minimum quantity of 20,000 tons and for every 20,000 tons thereafter, the Department will obtain an additional verification sample at random using the Asphalt Mixture Sample Random Tonnage Generator in order to verify the integrity of the Contractor's and Department's laboratory testing equipment and technicians. The Department will obtain a mixture sample of at least 150 lb at the asphalt mixing plant according to KM 64-425 and split it according to AASHTO R 47. The Department will retain one split portion of the sample and provide the other portion to the Contractor. At a later time convenient to both parties, the Department and Contractor will simultaneously reheat the sample to the specified compaction temperature and test the mixture for AV and VMA using separate laboratory equipment according to the corresponding procedures given in Subsection 402.03.02. The Department will evaluate the differences in test results between the two laboratories. When the difference between the results for AV or VMA is not within ± 2.0 percent, the Department will investigate and resolve the discrepancy according to Subsection 402.03.05.
Subsection:	402.03.04 Dispute Resolution.
Revision:	Change the subsection number to 402.03.05.
Subsection:	402.05 PAYMENT.
Part:	Lot Pay Adjustment Schedule Compaction Option A Base and Binder Mixtures
Table:	AC
Revision:	Replace the Deviation from JMF(%) that corresponds to a Pay Value of 0.95 to ± 0.6 .
Subsection:	403.02.10 Material Transfer Vehicle (MTV).
Revision:	Replace the first sentence with the following: In addition to the equipment specified above, provide a MTV with the following minimum characteristics:
Subsection:	412.02.09 Material Transfer Vehicle (MTV).
Revision:	Replace the paragraph with the following: Provide and utilize a MTV with the minimum characteristics outlined in section 403.02.10.

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Subsection:	412.03.07 Placement and Compaction.
Revision:	Replace the first paragraph with the following: Use a MTV when placing SMA mixture in the driving lanes. The MTV is not required on ramps and/or shoulders unless specified in the contract. When the Engineer determines the use of the MTV is not practical for a portion of the project, the Engineer may waive its requirement for that portion of pavement by a letter documenting the waiver.
Subsection:	412.04 MEASUREMENT.
Revision:	Add the following subsection: 412.04.03. Material Transfer Vehicle (MTV). The Department will not measure the MTV for payment and will consider its use incidental to the asphalt mixture.
Subsection:	501.03.05 Weather Limitations and Protection.
Revision:	Replace the reference to Subsection 501.03.19 in Paragraph 5, with Subsection 501.03.20.
Subsection:	501.03.19 Surface Tolerances and Testing Surface.
Part:	B) Ride Quality.
Revision:	Add the following to the end of the first paragraph: The Department will specify if the ride quality requirements are Category A or Category B when ride quality is specified in the Contract. Category B ride quality requirements shall apply when the Department fails to classify which ride quality requirement will apply to the Contract.
Subsection:	603.03.06 Cofferdams.
Revision:	Replace the seventh sentence of paragraph one with the following: Submit drawings that are stamped by a Professional Engineer licensed in the Commonwealth of Kentucky.
Subsection:	605.03.04 Tack Welding.
Revision:	Insert the subsection and the following: 605.03.04 Tack Welding. The Department does not allow tack welding.
Subsection:	606.03.17 Special Requirements for Latex Concrete Overlays.
Part:	A) Existing Bridges and New Structures.
Number:	1) Prewetting and Grout-Bond Coat.
Revision:	Add the following sentence to the last paragraph: Do not apply a grout-bond coat on bridge decks prepared by hydrodemolition.
Subsection:	609.03 Construction.
Revision:	Replace Subsection 609.03.01 with the following: 609.03.01 A) Swinging the Spans. Before placing concrete slabs on steel spans or precast concrete release the temporary erection supports under the bridge and swing the span free on its supports. 609.03.01 B) Lift Loops. Cut all lift loops flush with the top of the precast beam once the beam is placed in the final location and prior to placing steel reinforcement. At locations where lift loops are cut, paint the top of the beam with galvanized or epoxy paint.

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Subsection:	611.03.02 Precast Unit Construction.
Revision:	Replace the first sentence of the subsection with the following: Construct units according to ASTM C1577, replacing Table 1 (Design Requirements for Precast Concrete Box Sections Under Earth, Dead and HL-93 Live Load Conditions) with KY Table 1 (Precast Culvert KYHL-93 Design Table) , and Section 605 with the following exceptions and additions:
Subsection:	613.03.01 Design.
Number:	2)
Revision:	Replace "AASHTO Standard Specifications for Highway Bridges" with "AASHTO LRFD Bridge Design Specifications"
Subsection:	615.06.02
Revision:	Add the following sentence to the end of the subsection. The ends of units shall be normal to walls and centerline except exposed edges shall be beveled $\frac{3}{4}$ inch.
Subsection:	615.06.03 Placement of Reinforcement in Precast 3-Sided Units.
Revision:	Replace the reference of 6.6 in the section to 615.06.06.
Subsection:	615.06.04 Placement of Reinforcement for Precast Endwalls.
Revision:	Replace the reference of 6.7 in the section to 615.06.07.
Subsection:	615.06.06 Laps, Welds, and Spacing for Precast 3-Sided Units.
Revision:	Replace the subsection with the following: Tension splices in the circumferential reinforcement shall be made by lapping. Laps may not be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.2 and AASHTO 2012 Bridge Design Guide Section 5.11.6.3. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.1 and AASHTO 2012 Bridge Design Guide Section 5.11.6.2. The overlap of welded wire fabric shall be measured between the outer most longitudinal wires of each fabric sheet. For deformed billet-steel bars, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.1. For splices other than tension splices, the overlap shall be a minimum of 12" for welded wire fabric or deformed billet-steel bars. The spacing center to center of the circumferential wires in a wire fabric sheet shall be no less than 2 inches and no more than 4 inches. The spacing center to center of the longitudinal wires shall not be more than 8 inches. The spacing center to center of the longitudinal distribution steel for either line of reinforcing in the top slab shall be not more than 16 inches.
Subsection:	615.06.07 Laps, Welds, and Spacing for Precast Endwalls.
Revision:	Replace the subsection with the following: Splices in the reinforcement shall be made by lapping. Laps may not be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.2 and AASHTO 2012 Bridge Design Guide Section 5.11.6.3. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.1 and AASHTO 2012 Bridge Design Guide Section 5.11.6.2. For deformed billet-steel bars, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.1. The spacing center-to-center of the wire fabric sheet shall not be less than 2 inches or more than 8 inches.

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Subsection:	615.08.01 Type of Test Specimen.
Revision:	Replace the subsection with the following: Start-up slump, air content, unit weight, and temperature tests will be performed each day on the first batch of concrete. Acceptable start-up results are required for production of the first unit. After the first unit has been established, random acceptance testing is performed daily for each 50 yd ³ (or fraction thereof). In addition to the slump, air content, unit weight, and temperature tests, a minimum of one set of cylinders shall be required each time plastic property testing is performed.
Subsection:	615.08.02 Compression Testing.
Revision:	Delete the second sentence.
Subsection:	615.08.04 Acceptability of Core Tests.
Revision:	Delete the entire subsection.
Subsection:	615.12 Inspection.
Revision:	Add the following sentences to the end of the subsection: Units will arrive at jobsite with the "Kentucky Oval" stamped on the unit which is an indication of acceptable inspection at the production facility. Units shall be inspected upon arrival for any evidence of damage resulting from transport to the jobsite.
Subsection:	701.04.16 Deduction for Pipe Deflection.
Revision:	Insert the following at the end of the paragraph: The section length is determined by the length of the pipe between joints where the failure occurred.
Subsection:	716.02.02 Paint.
Revision:	Replace sentence with the following: Conform to Section 821.
Subsection:	716.03 CONSTRUCTION.
Revision:	Replace bullet 5) with the following: 5) AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims,
Subsection:	716.03.02 Lighting Standard Installation.
Revision:	Replace the second sentence with the following: Regardless of the station and offset noted, locate all poles/bases behind the guardrail a minimum of four feet from the front face of the guardrail to the front face of the pole base.
Subsection:	716.03.02 Lighting Standard Installation.
Part:	A) Conventional Installation.
Revision:	Replace the third sentence with the following: Orient the transformer base so the door is positioned on the side away from on-coming traffic.
Subsection:	716.03.02 Lighting Standard Installation.
Part:	A) Conventional Installation.
Number:	1) Breakaway Installation and Requirements.
Revision:	Replace the first sentence with the following: For breakaway supports, conform to Section 12 of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims.
Subsection:	716.03.02 Lighting Standard Installation.
Part:	B) High Mast Installation
Revision:	Replace the first sentence with the following: Install each high mast pole as noted on plans.

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Subsection:	716.03.02 Lighting Standard Installation.
Part:	B) High Mast Installation
Number:	2) Concrete Base Installation
Revision:	Modification of Chart and succeeding paragraphs within this section:

Drilled Shaft Depth Data							
Level Ground		3:1 Ground Slope		2:1 Ground Slope		1.5:1 Ground Slope ⁽²⁾	
Soil	Rock	Soil	Rock	Soil	Rock	Soil	Rock
17 ft	7 ft	19 ft	7 ft	20 ft	7 ft	(1)	7 ft

Steel Requirements			
Vertical Bars		Ties or Spiral	
Size	Total	Size	Spacing or Pitch
#10	16	#4	12 inch

(1): Shaft length is 22' for cohesive soil only. For cohesionless soil, contact geotechnical branch for design.

(2): Do not construct high mast drilled shafts on ground slopes steeper than 1.5:1 without the approval of the Division of Traffic.

If rock is encountered during drilling operations and confirmed by the engineer to be of sound quality, the shaft is only required to be further advanced into the rock by the length of rock socket shown in the table. The total length of the shaft need not be longer than that of soil alone. Both longitudinal rebar length and number of ties or spiral length shall be adjusted accordingly.

If a shorter depth is desired for the drilled shaft, the contractor shall provide, for the state's review and approval, a detailed column design with individual site specific soil and rock analysis performed and approved by a Professional Engineer licensed in the Commonwealth of Kentucky.

Spiral reinforcement may be substituted for ties. If spiral reinforcement is used, one and one-half closed coils shall be provided at the ends of each spiral unit. Subsurface conditions consisting of very soft clay or very loose saturated sand could result in soil parameters weaker than those assumed. Engineer shall consult with the geotechnical branch if such conditions are encountered.

The bottom of the drilled hole shall be firm and thoroughly cleaned so no loose or compressible materials are present at the time of the concrete placement. If the drilled hole contains standing water, the concrete shall be placed using a tremie to displace water. Continuous concrete flow will be required to insure full displacement of any water.

The reinforcement and anchor bolts shall be adequately supported in the proper positions so no movement occurs during concrete placement. Welding of anchor bolts to the reinforcing cage is unacceptable, templates shall be used. Exposed portions of the foundation shall be formed to create a smooth finished surface. All forming shall be removed upon completion of foundation construction.

Subsection:	716.03.03 Trenching.
Part:	A) Trenching of Conduit for Highmast Ducted Cables.
Revision:	Add the following after the first sentence: If depths greater than 24 inches are necessary, obtain the Engineer's approval and maintain the required conduit depths coming into the junction boxes. No payment for additional junction boxes for greater depths will be allowed.

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Subsection:	716.03.03 Trenching.
Part:	B) Trenching of Conduit for Non-Highmast Cables.
Revision:	Add the following after the second sentence: If depths greater than 24 inches are necessary for either situation listed previously, obtain the Engineer's approval and maintain the required conduit depths coming into the junction boxes. No payment for additional junction boxes for greater depths will be allowed.
Subsection:	716.03.10 Junction Boxes.
Revision:	Replace subsection title with the following: Electrical Junction Box.
Subsection:	716.04.07 Pole with Secondary Control Equipment.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as each individual unit furnished and installed. The Department will not measure mounting the cabinet to the pole, backfilling, restoration, any necessary hardware to anchor pole, or electrical inspection fees, and will consider them incidental to this item of work. The Department will also not measure furnishing and installing electrical service conductors, specified conduits, meter base, transformer, service panel, fused cutout, fuses, lighting arrestors, photoelectrical control, circuit breaker, contactor, manual switch, ground rods, and ground wires and will consider them incidental to this item of work.
Subsection:	716.04.08 Lighting Control Equipment.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as each individual unit furnished and installed. The Department will not measure constructing the concrete base, excavation, backfilling, restoration, any necessary anchors, or electrical inspection fees, and will consider them incidental to this item of work. The Department will also not measure furnishing and installing electrical service conductors, specified conduits, meter base, transformer, service panel, fused cutout, fuses, lighting arrestors, photoelectrical control, circuit breakers, contactor, manual switch, ground rods, and ground wires and will consider them incidental to this item of work.
Subsection:	716.04.09 Luminaire.
Revision:	Replace the first sentence with the following: The Department will measure the quantity as each individual unit furnished and installed.
Subsection:	716.04.10 Fused Connector Kits.
Revision:	Replace the first sentence with the following: The Department will measure the quantity as each individual unit furnished and installed.
Subsection:	716.04.13 Junction Box.
Revision:	Replace the subsection title with the following: Electrical Junction Box Type Various.
Subsection:	716.04.13 Junction Box.
Part:	A) Junction Electrical.
Revision:	Rename A) Junction Electrical to the following: A) Electrical Junction Box.
Subsection:	716.04.14 Trenching and Backfilling.
Revision:	Replace the second sentence with the following: The Department will not measure excavation, backfilling, underground utility warning tape (if required), the restoration of disturbed areas to original condition, and will consider them incidental to this item of work.

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Subsection:	716.04.18 Remove Lighting.															
Revision:	Replace the paragraph with the following: The Department will measure the quantity as a lump sum for the removal of lighting equipment. The Department will not measure the disposal of all equipment and materials off the project by the contractor. The Department also will not measure the transportation of the materials and will consider them incidental to this item of work.															
Subsection:	716.04.20 Bore and Jack Conduit.															
Revision:	Replace the paragraph with the following: The Department will measure the quantity in linear feet. This item shall include all work necessary for boring and installing conduit under an existing roadway. Construction methods shall be in accordance with Sections 706.03.02, paragraphs 1, 2, and 4.															
Subsection:	716.05 PAYMENT.															
Revision:	Replace items 04810-04811, 20391NS835 and, 20392NS835 under <u>Code</u> , <u>Pay Item</u> , and <u>Pay Unit</u> with the following:															
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Subsection:	723.02.02 Paint.															
Revision:	Replace sentence with the following: Conform to Section 821.															
Subsection:	723.03 CONSTRUCTION.															
Revision:	Replace bullet 5) with the following: 5) AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims,															
Subsection:	723.03.02 Poles and Bases Installation.															
Revision:	Replace the first sentence with the following: Regardless of the station and offset noted, locate all poles/bases behind the guardrail a minimum of four feet from the front face of the guardrail to the front face of the pole base.															
Subsection:	723.03.02 Poles and Bases Installation.															
Part:	A) Steel Strain and Mastarm Poles Installation															
Revision:	Replace the second paragraph with the following: For concrete base installation, see Section 716.03.02, B), 2), Paragraphs 2-7. Drilled shaft depth shall be based on the soil conditions encountered during drilling and slope condition at the site. Refer to the design chart below:															
Subsection:	723.03.02 Poles and Bases Installation.															
Part:	B) Pedestal or Pedestal Post Installation.															
Revision:	Replace the fourth sentence of the paragraph with the following: For breakaway supports, conform to Section 12 of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims.															

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Subsection:	723.03.03 Trenching.
Part:	A) Under Roadway.
Revision:	Add the following after the second sentence: If depths greater than 24 inches are necessary, obtain the Engineer's approval and maintain ether required conduit depths coming into the junction boxes. No payment for additional junction boxes for greater depths will be allowed.
Subsection:	723.03.11 Wiring Installation.
Revision:	Add the following sentence between the fifth and sixth sentences: Provide an extra two feet of loop wire and lead-in past the installed conduit in poles, pedestals, and junction boxes.
Subsection:	723.03.12 Loop Installation.
Revision:	Replace the fourth sentence of the 2nd paragraph with the following: Provide an extra two feet of loop wire and lead-in past the installed conduit in poles, pedestals, and junction boxes.
Subsection:	723.04.02 Junction Box.
Revision:	Replace subsection title with the following: Electrical Junction Box Type Various.
Subsection:	723.04.03 Trenching and Backfilling.
Revision:	Replace the second sentence with the following: The Department will not measure excavation, backfilling, underground utility warning tape (if required), the restoration of disturbed areas to original condition, and will consider them incidental to this item of work.
Subsection:	723.04.10 Signal Pedestal.
Revision:	Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, specified conduits, fittings, ground rod, ground wire, backfilling, restoring disturbed areas, or other necessary hardware and will consider them incidental to this item of work.
Subsection:	723.04.15 Loop Saw Slot and Fill.
Revision:	Replace the second sentence with the following: The Department will not measure sawing, cleaning and filling induction loop saw slot, loop sealant, backer rod, and grout and will consider them incidental to this item of work.
Subsection:	723.04.16 Pedestrian Detector.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as each individual unit furnished, installed and connected to pole/pedestal. The Department will not measure installing R10-3e (with arrow) sign, furnishing and installing mounting hardware for sign and will consider them incidental to this item of work.
Subsection:	723.04.18 Signal Controller- Type 170.
Revision:	Replace the second sentence with the following: The Department will not measure constructing the concrete base or mounting the cabinet to the pole, connecting the signal and detectors, excavation, backfilling, restoration, any necessary pole mounting hardware, electric service, or electrical inspection fees and will consider them incidental to this item of work. The Department will also not measure furnishing and connecting the induction of loop amplifiers, pedestrian isolators, load switches, model 400 modem card; furnishing and installing electrical service conductors, specified conduits, anchors, meter base, fused cutout, fuses, ground rods, ground wires and will consider them incidental to this item of work.

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Subsection:	723.04.20 Install Signal Controller - Type 170.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as each individual unit installed. The Department will not measure constructing the concrete base or mounting the cabinet to the pole, connecting the signal and detectors, and excavation, backfilling, restoration, any necessary pole mounting hardware, electric service, or electrical inspection fees and will consider them incidental to this item of work. The Department will also not measure connecting the induction loop amplifiers, pedestrian, isolators, load switches, model 400 modem card; furnishing and installing electrical service conductors, specified conduits, anchors, meter base, fused cutout, fuses, ground rods, ground wires and will consider them incidental to this item of work.
Subsection:	723.04.22 Remove Signal Equipment.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as a lump sum removal of signal equipment. The Department will not measure the return of control equipment and signal heads to the Department of Highways as directed by the District Traffic Engineer. The Department also will not measure the transportation of materials of the disposal of all other equipment and materials off the project by the contractor and will consider them incidental to this item of work.
Subsection:	723.04.28 Install Pedestrian Detector Audible.
Revision:	Replace the second sentence with the following: The Department will not measure installing sign R10-3e (with arrow) and will consider it incidental to this item of work.
Subsection:	723.04.29 Audible Pedestrian Detector.
Revision:	Replace the second sentence with the following: The Department will not measure furnishing and installing the sign R10-3e (with arrow) and will consider it incidental to this item of work.
Subsection:	723.04.30 Bore and Jack Conduit.
Revision:	Replace the paragraph with the following: The Department will measure the quantity in linear feet. This item shall include all work necessary for boring and installing conduit under an existing roadway. Construction methods shall be in accordance with Sections 706.03.02, paragraphs 1, 2, and 4.
Subsection:	723.04.31 Install Pedestrian Detector.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as each individual unit installed and connected to pole/pedestal. The Department will not measure installing sign R 10-3e (with arrow) and will consider it incidental to this item of work.
Subsection:	723.04.32 Install Mast Arm Pole.
Revision:	Replace the second sentence with the following: The Department will not measure arms, signal mounting brackets, anchor bolts, or any other necessary hardware and will consider them incidental to this item of work.
Subsection:	723.04.33 Pedestal Post.
Revision:	Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, anchor bolts, conduit, fittings, ground rod, ground wire, backfilling, restoration, or any other necessary hardware and will consider them incidental to this item of work.

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Subsection:	723.04.36 Traffic Signal Pole Base.															
Revision:	Replace the second sentence with the following: The Department will not measure excavation, reinforcing steel, anchor bolts, specified conduits, ground rods, ground wires, backfilling, or restoration and will consider them incidental to this item of work.															
Subsection:	723.04.37 Install Signal Pedestal.															
Revision:	Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, anchor bolts, specified conduits, fittings, ground rod, ground wire, backfilling, restoration, or any other necessary hardware and will consider them incidental to this item of work.															
Subsection:	723.04.38 Install Pedestal Post.															
Revision:	Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, anchor bolts, specified conduits, fittings, ground rod, ground wire, backfilling, restoration, or any other necessary hardware and will consider them incidental to this item of work.															
Subsection:	723.05 PAYMENT.															
Revision:	Replace items 04810-04811, 20391NS835 and, 20392NS835 under <u>Code</u> , <u>Pay Item</u> , and <u>Pay Unit</u> with the following:															
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Subsection:	804.01.02 Crushed Sand.															
Revision:	Delete last sentence of the section.															
Subsection:	804.01.06 Slag.															
Revision:	Add subsection and following sentence. Provide blast furnace slag sand where permitted. The Department will allow steel slag sand only in asphalt surface applications.															
Subsection:	804.04 Asphalt Mixtures.															
Revision:	Replace the subsection with the following: Provide natural, crushed, conglomerate, or blast furnace slag sand, with the addition of filler as necessary, to meet gradation requirements. The Department will allow any combination of natural, crushed, conglomerate or blast furnace slag sand when the combination is achieved using cold feeds at the plant. The Engineer may allow other fine aggregates.															
Subsection:	806.03.01 General Requirements.															
Revision:	Replace the second sentence of the paragraph with the following: Additionally, the material must have a minimum solubility of 99.0 percent when tested according to AASHTO T 44 and PG 76-22 must exhibit a minimum recovery of 60 percent, with a J _{NR} (nonrecoverable creep compliance) between 0.1 and 0.5, when tested according to AASHTO TP 70.															

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Subsection:	806.03.01 General Requirements.						
Table:	PG Binder Requirements and Price Adjustment Schedule						
Revision:	Replace the Elastic Recovery, % ⁽³⁾ (AASHTO T301) and all corresponding values in the table with the following:						
	<u>Test</u>	<u>Specification</u>	<u>100% Pay</u>	<u>90% Pay</u>	<u>80% Pay</u>	<u>70% Pay</u>	<u>50% Pay⁽¹⁾</u>
	MSCR recovery, % ⁽³⁾ (AASHTO TP 70)	60 Min.	≥58	56	55	54	<53
Subsection:	806.03.01 General Requirements.						
Table:	PG Binder Requirements and Price Adjustment Schedule						
Superscript:	(3)						
Revision:	Replace ⁽³⁾ with the following: Perform testing at 64°C.						
Subsection:	813.04 Gray Iron Castings.						
Revision:	Replace the reference to "AASHTO M105" with "ASTM A48".						
Subsection:	813.09.02 High Strength Steel Bolts, Nuts, and Washers.						
Number:	A) Bolts.						
Revision:	Delete first paragraph and "Hardness Number" Table. Replace with the following: A) Bolts. Conform to ASTM A325 (AASHTO M164) or ASTM A490 (AASHTO 253) as applicable.						
Subsection:	814.04.02 Timber Guardrail Posts.						
Revision:	Third paragraph, replace the reference to "AWPA C14" with "AWPA U1, Section B, Paragraph 4.1".						
Subsection:	814.04.02 Timber Guardrail Posts.						
Revision:	Replace the first sentence of the fourth paragraph with the following: Use any of the species of wood for round or square posts covered under AWPA U1.						
Subsection:	814.04.02 Timber Guardrail Posts.						
Revision:	Fourth paragraph, replace the reference to "AWPA C2" with "AWPA U1, Section B, Paragraph 4.1".						
Subsection:	814.04.02 Timber Guardrail Posts.						
Revision:	Delete the second sentence of the fourth paragraph.						
Subsection:	814.05.02 Composite Plastic.						
Revision:	1) Add the following to the beginning of the first paragraph: Select composite offset blocks conforming to this section and assure blocks are from a manufacturer included on the Department's List of Approved Materials. 2) Delete the last paragraph of the subsection.						
Subsection:	816.07.02 Wood Posts and Braces.						
Revision:	First paragraph, replace the reference to "AWPA C5" with "AWPA U1, Section B, Paragraph 4.1".						
Subsection:	816.07.02 Wood Posts and Braces.						
Revision:	Delete the second sentence of the first paragraph.						
Subsection:	818.07 Preservative Treatment.						
Revision:	First paragraph, replace all references to "AWPA C14" with "AWPA U1, Section A".						

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<p>Subsection: Revision:</p>	<p>834.14 Lighting Poles. Replace the first sentence with the following: Lighting pole design shall be in accordance with loading and allowable stress requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims, with the exception of the following: The Cabinet will waive the requirement stated in the first sentence of Section 5.14.6.2 – Reinforced Holes and Cutouts for high mast poles (only). The minimum diameter at the base of the pole shall be 22 inches for high mast poles (only).</p>
<p>Subsection Revision:</p>	<p>834.14.03 High Mast Poles. Remove the second and fourth sentence from the first paragraph.</p>
<p>Subsection Revision:</p>	<p>834.14.03 High Mast Poles. Replace the third paragraph with the following: Provide calculations and drawings that are stamped by a Professional Engineer licensed in the Commonwealth of Kentucky.</p>
<p>Subsection: Revision:</p>	<p>834.14.03 High Mast Poles. Replace paragraph six with the following: Provide a pole section that conforms to ASTM A 595 grade A with a minimum yield strength of 55 KSI or ASTM A 572 with a minimum yield strength of 55 KSI. Use tubes that are round or 16 sided with a four inch corner radius, have a constant linear taper of .144 in/ft and contain only one longitudinal seam weld. Circumferential welded tube butt splices and laminated tubes are not permitted. Provide pole sections that are telescopically slip fit assembled in the field to facilitate inspection of interior surface welds and the protective coating. The minimum length of the telescopic slip splices shall be 1.5 times the inside diameter of the exposed end of the female section. Use longitudinal seam welds as commended in Section 5.15 of the AASHTO 2013 Specifications. The thickness of the transverse base shall not be less than 2 inches. Plates shall be integrally welded to the tubes with a telescopic welded joint or a full penetration groove weld with backup bar. The handhole cover shall be removable from the handhole frame. One the frame side opposite the hinge, provide a mechanism on the handhole cover/frame to place the Department’s standard padlock as specified in Section 834.25. The handhole frame shall have two stainless studs installed opposite the hinge to secure the handhole cover to the frame which includes providing stainless steel wing nuts and washers. The handhole cover shall be manufactured from 0.25 inch thick galvanized steel (ASTM A 153) and have a neoprene rubber gasket that is permanently secured to the handhole frame to insure weather-tight protection. The hinge shall be manufactured from 7-gauge stainless steel to provide adjustability to insure weather-tight fit for the cover. The minimum clear distance between the transverse plate and the bottom opening of the handhole shall not be less than the diameter of the bottom tube of the pole but needs to be at least 15 inches. Provide products that are hot-dip galvanized to the requirements of either ASTM A123 (fabricated products) or ASTM A 153 (hardware items).</p>
<p>Subsection: Revision:</p>	<p>834.16 ANCHOR BOLTS. Insert the following sentence at the beginning of the paragraph: The anchor bolt design shall follow the NCHRP Report 494 Section 2.4 and NCHRP 469 Appendix A Specifications.</p>

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Subsection:	834.17.01 Conventional.
Revision:	Add the following sentence after the second sentence: Provide a waterproof sticker mounted on the bottom of the housing that is legible from the ground and indicates the wattage of the fixture by providing the first two numbers of the wattage.
Subsection:	834.21.01 Waterproof Enclosures.
Revision:	Replace the last five sentences in the second paragraph with the following sentences: Provide a cabinet door with a louvered air vent, filter-retaining brackets and an easy to clean metal filter. Provide a cabinet door that is keyed with a factory installed standard no. 2 corbin traffic control key. Provide a light fixture with switch and bulb. Use a 120-volt fixture and utilize a L.E.D. bulb (equivalent to 60 watts minimum). Fixture shall be situated at or near the top of the cabinet and illuminate the contents of the cabinet. Provide a 120 VAC GFI duplex receptacle in the enclosure with a separate 20 amp breaker.
Subsection:	835.07 Traffic Poles.
Revision:	Replace the first sentence of the first paragraph with the following: Pole diameter and wall thickness shall be calculated in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims.
Subsection:	835.07 Traffic Poles.
Revision:	*Replace the first sentence of the fourth paragraph with the following: Ensure transverse plates have a thickness ≥ 2 inches. *Add the following sentence to the end of the fourth paragraph: The bottom pole diameter shall not be less than 16.25 inches.
Subsection:	835.07 Traffic Poles.
Revision:	Replace the third sentence of the fifth paragraph with the following: For anchor bolt design, pole forces shall be positioned in such a manner to maximize the force on any individual anchor bolt regardless of the actual anchor bolt orientation with the pole.
Subsection:	835.07 Traffic Poles.
Revision:	Replace the first and second sentence of the sixth paragraph with the following: The pole handhole shall be 25 inches by 6.5 inches. The handhole cover shall be removable from the handhole frame. On the frame side opposite the hinge, provide a mechanism on the handhole cover/frame to place the Department's standard padlock as specified in Section 834.25. The handhole frame shall have two stainless studs installed opposite the hinge to secure the handhole cover to the frame which includes providing stainless steel wing nuts and washers. The handhole cover shall be manufactured from 0.25 inch thick galvanized steel (ASTM 153) and have a neoprene rubber gasket that is permanently secured to the handhole frame to insure weather-tight protection. The hinge shall be manufactured from 7 gauge stainless steel to provide adjustability to insure a weather-tight fit for the cover. The minimum clear distance between the transverse plate and the bottom opening of the handhole shall not be less than the diameter of the bottom tube but needs to be at least 12 inches.

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Subsection:	835.07 Traffic Poles.									
Revision:	*Replace the first sentence of the last paragraph with the following: Provide calculations and drawings that are stamped by a Professional Engineer licensed in the Commonwealth of Kentucky. *Replace the third sentence of the last paragraph with the following: All tables referenced in 835.07 are found in the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims.									
Subsection:	835.07.01 Steel Strain Poles.									
Revision:	Replace the second sentence of the second paragraph with the following: The detailed analysis shall be certified by a Professional Engineer licensed in the Commonwealth of Kentucky.									
Subsection:	835.07.01 Steel Strain Poles.									
Revision:	Replace number 7. after the second paragraph with the following: 7. Fatigue calculations should be shown for all fatigue related connections. Provide the corresponding detail, stress category and example from table 11.9.3.1-1.									
Subsection:	835.07.02 Mast Arm Poles.									
Revision:	Replace the second sentence of the fourth paragraph with the following: The detailed analysis shall be certified by a Professional Engineer licensed in the Commonwealth of Kentucky.									
Subsection:	835.07.02 Mast Arm Poles.									
Revision:	Replace number 7) after the fourth paragraph with the following: 7) Fatigue calculations should be shown for all fatigue related connections. Provide the corresponding detail, stress category and example from table 11.9.3.1-1.									
Subsection:	835.07.03 Anchor Bolts.									
Revision:	Add the following to the end of the paragraph: There shall be two steel templates (one can be used for the headed part of the anchor bolt when designed in this manner) provided per pole. Templates shall be contained within a 26.5 inch diameter. All templates shall be fully galvanized (ASTM A 153).									
Subsection:	835.16.05 Optical Units.									
Revision:	Replace the 3rd paragraph with the following: The list of certified products can be found on the following website: http://www.intertek.com .									
Subsection:	835.19.01 Pedestrian Detector Body.									
Revision:	Replace the first sentence with the following: Provide a four holed pole mounted aluminum rectangular housing that is compatible with the pedestrian detector.									
Subsection:	843.01.01 Geotextile Fabric.									
Table:	TYPE I FABRIC GEOTEXTILES FOR SLOPE PROTECTION AND CHANNEL LINING									
Revision:	Add the following to the chart:									
	<table border="1"> <thead> <tr> <th><u>Property</u></th> <th><u>Minimum Value⁽¹⁾</u></th> <th><u>Test Method</u></th> </tr> </thead> <tbody> <tr> <td>CBR Puncture (lbs)</td> <td>494</td> <td>ASTM D6241</td> </tr> <tr> <td>Permittivity (1/s)</td> <td>0.7</td> <td>ASTM D4491</td> </tr> </tbody> </table>	<u>Property</u>	<u>Minimum Value⁽¹⁾</u>	<u>Test Method</u>	CBR Puncture (lbs)	494	ASTM D6241	Permittivity (1/s)	0.7	ASTM D4491
<u>Property</u>	<u>Minimum Value⁽¹⁾</u>	<u>Test Method</u>								
CBR Puncture (lbs)	494	ASTM D6241								
Permittivity (1/s)	0.7	ASTM D4491								

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Subsection:	843.01.01 Geotextile Fabric.		
Table:	TYPE II FABRIC GEOTEXTILES FOR UNDERDRAINS		
Revision:	Add the following to the chart:		
	<u>Property</u>	<u>Minimum Value⁽¹⁾</u>	<u>Test Method</u>
	CBR Puncture (lbs)	210	ASTM D6241
	Permittivity (1/s)	0.5	ASTM D4491
Subsection:	843.01.01 Geotextile Fabric.		
Table:	TYPE III FABRIC GEOTEXTILES FOR SUBGRADE OR EMBANKMENT STABILIZATION		
Revision:	Add the following to the chart:		
	<u>Property</u>	<u>Minimum Value⁽¹⁾</u>	<u>Test Method</u>
	CBR Puncture (lbs)	370	ASTM D6241
	Permittivity (1/s)	0.05	ASTM D4491
Subsection:	843.01.01 Geotextile Fabric.		
Table:	TYPE IV FABRIC GEOTEXTILES FOR EMBANKMENT DRAINAGE BLANKETS AND PAVEMENT EDGE DRAINS		
Revision:	Add the following to the chart:		
	<u>Property</u>	<u>Minimum Value⁽¹⁾</u>	<u>Test Method</u>
	CBR Puncture (lbs)	309	ASTM D6241
	Permittivity (1/s)	0.5	ASTM D4491
Subsection:	843.01.01 Geotextile Fabric.		
Table:	TYPE V HIGH STRENGTH GEOTEXTILE FABRIC		
Revision:	Make the following changes to the chart:		
	<u>Property</u>	<u>Minimum Value⁽¹⁾</u>	<u>Test Method</u>
	CBR Puncture (lbs)	618	ASTM D6241
	Apparent Opening Size	U.S. #40 ⁽³⁾	ASTM D4751
	⁽³⁾ Maximum average roll value.		

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

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**SPECIAL NOTE FOR BORING AND JACKING STEEL PIPE
WITHOUT CARRIER PIPE**

This Special Note will apply where indicated on the plans or in the proposal. Section references herein are to the Department’s 2012 Standard Specifications for Road and Bridge Construction.

1.0 DESCRIPTION. Bore and jack steel pipe. Use this note when no carrier pipe will be encased.

2.0 MATERIALS.

2.1 Pipe. Provide plain end steel pipe with a specific minimum yield strength, SMYS, of at least 35,000 psi and tensile strength of 60,000 psi per API-5L grade B material. The steel pipe supplied shall be manufactured by the seamless, electric-weld, submerged-arc weld or gas metal-arc well process as specified in API –5L. Certification of 35,000 psi SMYS shall be furnished by the supplier through the Contractor to the Engineer to retain 3 copies.

MINIMUM WALL THICKNESS FOR STEEL PIPE	
Nominal Diameter (Inches)	Wall Thickness (Inches)
18 or less	0.375
24	0.500
30	0.500
36	0.532
42	0.625

2.2 Grout. Conform to Subsection 601.03.03.

2.3 High Grade Bentonite. Conform to the following:

API 13A Section 4		
Requirement	Specification	Result
Viscometer Dial Reading at 600 rpm	30, minimum	40
Yield Point/Plastic Viscosity Ratio	3, maximum	3.00 maximum
Filtrate Volume	15 cm ³ , maximum	14.50 maximum
Residue greater than 75 micrometers	4.0 wt percent maximum	1.0-1.5 %
Moisture	10.0 wt percent maximum	9.0-9.5%

3.0 CONSTRUCTION. Perform the following:

1. Locate a suitable pit and obtain the Engineer’s approval.
2. Excavate the pit or trenches for the BORE AND JACK operation and for placing the end joints of pipe, when required. Securely sheet and brace the pits or trenches to prevent caving, where necessary.

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3. When installing pipe under railroads, highways, streets, or other facilities by Bore and Jack, perform construction without interfering with the facility operation or weakening the roadbed or structure.
4. Place excavated material near the top of the working pit and dispose of it as required. Use water or other fluids with the boring operation to lubricate the cuttings. Do not perform jetting.
5. In unconsolidated soil formations, use a gel-forming colloidal drilling fluid with at least 10 percent of high grade bentonite to consolidate excavated material, seal the walls of the hole, and lubricate subsequent removal of material and immediate pipe installation.
6. Ensure that the diameter of the excavation conforms to the outside diameter of the pipe as closely as possible.
7. Pressure grout voids that develop during the installation operation and that the Engineer determines are detrimental to the Work.
8. To force the pipe through the roadbed into the bored space, use a jack with a head constructed to apply uniform pressure around the ring of the pipe, which shall be square cut.
9. Set the pipe to be jacked on guides, braced together to properly support the pipe section and to direct it to the proper line and grade.
10. When the installation is made by concurrent boring and jacking, solidly weld all joints. Ensure the weld is strong enough to withstand the forces exerted from the boring and jacking operations as well as the vertical loading imposed on the pipe after installation and that it provides a smooth, non-obstructing joint in the interior of the pipe.
11. When the pipe is installed in open trench, bed and backfill according to Section 701.
12. The line and grade from the pipe's final position, as shown on plans, may vary no more than 2 percent in lateral alignment and one percent in vertical grade. Ensure that the final grade of the flow line is in the direction indicated on the Plans.
13. Use a cutting edge around the head end. Extend it a short distance beyond the pipe end with inside angles or lugs to keep the cutting edge from slipping back into the pipe.
14. Once the pipe installation begins, proceed with the operation without interruption to prevent the pipe from becoming firmly set in the embankment.
15. Remove and replace pipe damaged in jacking operations.
16. After completing the installation, backfill the excavated pits and trenches with flowable fill according to Section 601.03.03 B) 5 a) if the pit is in median area where it will have pavement over it.

4.0 MEASUREMENT. The Department will measure the completed length of Bore and Jacked pipe through the flowline from end to end in linear feet. The Department will not measure pressure grouting voids or removal and replacement of pipe damaged in jacking operations for payment and will consider it incidental to Bore and Jack. When abandoning a bore hole due to mechanical malfunction, improper alignment, or other problems due to construction operations, the Department will not measure the backfill and relocation for payment and will consider it incidental to this item of work. When abandoning a bore hole due to an unforeseen physical obstruction or situation, the Department will measure the work according to a negotiated supplemental agreement.

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

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<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
----	Bore and Jack, Size Pipe	Linear Foot

The Department will consider payment as full compensation for all materials, earthwork, shoring, pipe and work required under this section.

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 2008 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 ¹	Type 1	Type 2	Type 3	Type 4	Test Method
Minimum tensile Strength lbs/ft	125	150	175	3000 by 1500	ASTM D6818 ²
UV stability (minimum % tensile retention)	80	80	80	90	ASTM D4355 ³ (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 ² Channel applications	6.0 ⁴	8.0 ⁴	10.0 ⁴	12.0 ⁴	ASTM D6459 ASTM D6460-07

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

²Minimum Average Roll Values for tensile strength of sample material machine direction.

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

⁴Maximum 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

April 18, 2009

GEOGRID REINFORCEMENT FOR ASPHALT PAVEMENTS

This Special Note will apply where indicated on the plans or in the proposal. Section references herein are to the Department's 2012 Standard Specifications for Road and Bridge Construction.

1.0 DESCRIPTION. This specification covers geogrid used for the reinforcement of asphalt pavements.

2.0 MATERIALS AND EQUIPMENT.

2.1 Geogrid. Furnish fiberglass-reinforced or polyester geogrid coated with an elastomeric polymer. Ensure the geogrid forms a stable network such that the ribs, filaments, or yarns retain their dimensional stability, including selvages. When the Contract specifies, furnish geogrid with a non-woven fabric backing composed of long chain synthetic polymers that are 95 percent by weight polyolefins or polyesters.

A) Physical Requirements. Furnish the specified geogrid type conforming to the Physical Requirements Table and ASTM D 4759. Ensure that each geogrid shipment is accompanied by a manufacturer's certification listing minimum average roll specification values of each lot number for those properties listed in the table.

When the Contract specifies, furnish geogrid with a non-woven fabric backing that conforms to AASHTO M288 for paving fabric, except the minimum melting point is 360 °F.

PROPERTY	TEST METHOD	SPECIFICATION
Tensile Strength, lb/in (min.)	GRI-GG1	560
Elongation at Break, % (max.)	GRI-GG1	5
Melting Point, °F (min.)	ASTM D 276	360
Aperture Size, inch	I. D. Calipered	1.0 by 1.0

B) Packaging, Shipment, and Storage. Ensure that each roll is labeled with the manufacturer's name, product type, style number, lot number, roll number, manufactured date, roll dimensions, chemical composition, and applicable physical properties. Protect the geogrid from direct sunlight, ultraviolet rays, flames, aggressive chemicals, mud, dirt, dust, and debris during all periods of shipment and storage. Keep geogrids dry until installation, and do not store directly on the ground.

2.2 Asphalt Distributor. Conform to 406.02.05.

2.3 Rolling Equipment. Use pneumatic-tired rollers that weigh at least 12 tons and have 7 to 9 tires capable of inflation pressures up to 125 psi. Maintain an inflation pressure in all tires within ± 5 psi of the manufacturer's recommended pressure. Arrange the tires so that the gap between the tires of the front axle is covered by the tires of the rear axle. Mount wheels to provide equal contact pressure under each wheel. Use a tire tread that is satisfactory to the Engineer. Maintain tire size and inflation pressure such that the contact pressure is at least 80 psi.

3.0 CONSTRUCTION.

3.1 Geogrid Representative. Ensure that a representative of the geogrid manufacturer is on the project when work begins, and remains on call as the project progresses, to advise the Engineer.

3.2 Weather Restrictions. Do not place the geogrid when weather conditions, in the opinion of the Engineer, are not suitable. Ensure the air and pavement temperatures sufficient to allow the tack coat to hold the geogrid, and fabric backing when specified, in place. Specifically, ensure the temperature is at least 60 °F and rising.

3.3 Surface Preparation. Perform any needed base repairs and repair all potholes, cracks greater the 1/4 inch, and any badly damaged or rough pavement which may require milling or placement of leveling course. Ensure the surface is dry, clean, dust-free, and between 40 and 140 °F. Using a calibrated distributor truck, apply an asphalt tack coat uniformly at a residual rate of 0.3 gallons per square yard for fabric backed material and at a residual rate of 0.08 gallons per square yard for material without backing. Unless the geogrid is precoated with an adhesive, apply the tack coat to a minimum of 3 inches wider than the area to be covered by the geogrid.

3.4 Geogrid Placement. Place the geogrid while the tack coat is still tacky/broken. Keep the material flat and wrinkle free throughout the installation. Roll the geogrid until the adhesive is activated or the geogrid is seated in the tack coat. Clean the roller with an asphalt release agent. Brooming may be required. On sharp curves, cut the edges and fold the geogrid over in the direction of the placement of the asphalt overlay. Overlap

side joints by one to 2 inches. Overlap all end-of-roll joints by 3 to 6 inches. Ensure that the overlaps are shingled in the direction of paving.

3.5 Asphalt Placement. Place the asphalt overlay at a minimum 2-inch compacted thickness. Pave over the geogrid on the same day of its placement. Except for paving equipment and vehicles, allow no traffic on the grid until the following course of asphalt mixture is placed.

3.6 Geogrid Repair. Repair any visible distress that occurs due to movement of the geogrid immediately after rolling. For small areas, remove the asphalt mixture from the affected area; replace the geogrid in its original position, and replace, level, and compact the asphalt mixture. Cut the geogrid if necessary for it to lie flat.

3.7 Sampling and Testing. The Department will sample the geogrid at the project site according to ASTM D 4354 and KM 64-113 at a frequency the Engineer determines. The Department will test the geogrid for all properties possible given the testing equipment availability. When the Department determines that an individual sample fails to meet any specification requirement, the Department will reject that roll and sample 2 additional rolls from the same lot. When the Department determines that either of these 2 additional samples fails to comply with any part of the specification, the Department will reject the entire quantity of rolls represented by that sample.

4.0 MEASUREMENT. The Department will measure the quantity of geogrid in square yards. The Department will not measure geogrid when the contract indicates that the geogrid are incidental to the work being performed or when no separate bid item for geogrid is listed in the proposal. The Department will not measure providing the geogrid manufacturer's representative for payment and will consider it incidental to the geogrid.

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>
00110	Geogrid Reinforcement for Asphalt	Square Yard

SPECIAL NOTE FOR BARCODE LABEL ON PERMANENT SIGNS

1.0 DESCRIPTION. Install barcode label on sheeting signs. Section references herein are to the Department’s 2012 Standard Specifications for Road and Bridge Construction.

2.0 MATERIALS. The Department will provide the Contractor with a 2 inch x 1 inch foil barcode label for each permanent sheeting sign. A unique number will be assigned to each barcode label.

The Contractor shall contact the Operations and Pavement Management Branch in the Division of Maintenance at (502) 564-4556 to obtain the barcode labels.

3.0 CONSTRUCTION. Apply foil barcode label in the lower right quadrant of the sign back. Signs where the bottom edge is not parallel to the ground, the lowest corner of the sign shall serve as the location to place the barcode label. The barcode label shall be placed no less than one-inch and no more than three inches from any edge of the sign. The barcode must be placed so that the sign post does not cover the barcode label.

Barcodes shall be applied in an indoor setting with a minimum air temperature of 50°F or higher. Prior to application of the barcode label, the back of the sign must be clean and free of dust, oil, etc. If the sign is not clean, an alcohol swab shall be used to clean the area. The area must be allowed to dry prior to placement of the barcode label.

Data for each sign shall include the barcode number, MUTCD reference number, sheeting manufacturer, sheeting type, manufacture date, color of primary reflective surface, installation date, latitude and longitude using the North American Datum of 1983 (NAD83) or the State Plane Coordinates using an x and y ordinate of the installed location.

Data should be provided electronically on the TC 71-229 Sign Details Information and TC 71-230 Sign Assembly Information forms. The Contractor may choose to present the data in a different format provided that the information submitted to the Department is equivalent to the information required on the Department TC forms. The forms must be submitted in electronic format regardless of which type of form is used. The Department will not accept PDF or handwritten forms. These completed forms must be submitted to the Department prior to final inspection of the signs. The Department will not issue formal acceptance for the project until the TC 71-229 and TC-230 electronic forms are completed for all signs and sign assemblies on the project.

4.0 MEASUREMENT. The Department will measure all work required for the installation of the barcode label and all work associated with completion and submission of the sign inventory data (TC 71-229 and TC 71-230).

The installation of the permanent sign will be measured in accordance to Section 715.

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

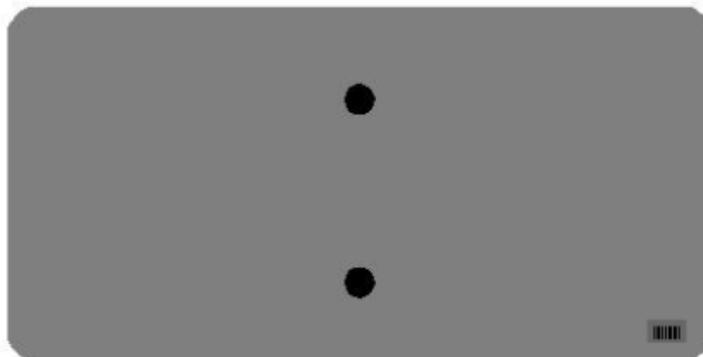
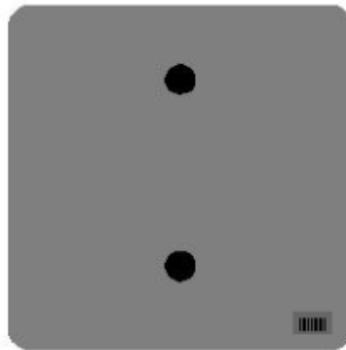
<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24631EC	Barcode Sign Inventory	Each

The Department will not make payment for this item until all barcodes are installed and sign inventory is complete on every permanent sign installed on the project. The Department will make payment for installation of the permanent sign in accordance to Section 715. The Department will consider payment as full compensation for all work required under this special note.

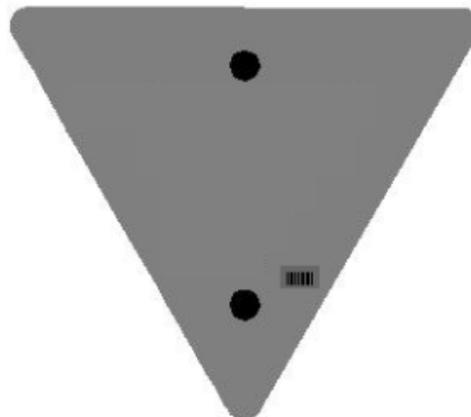
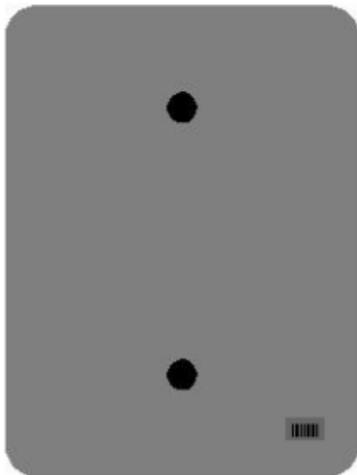
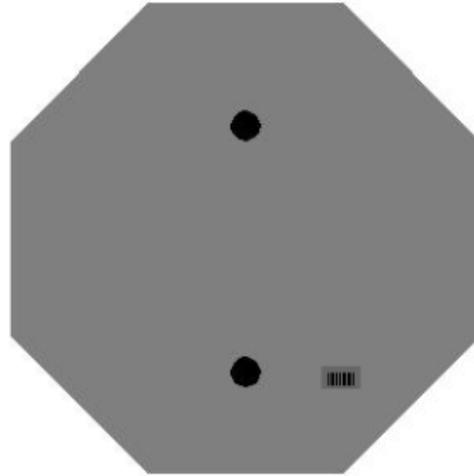
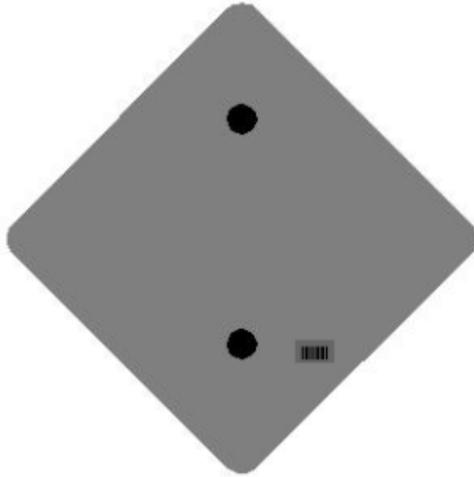
One Sign Post



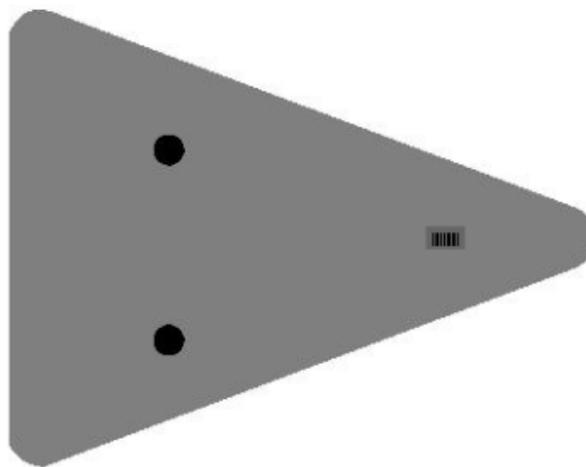
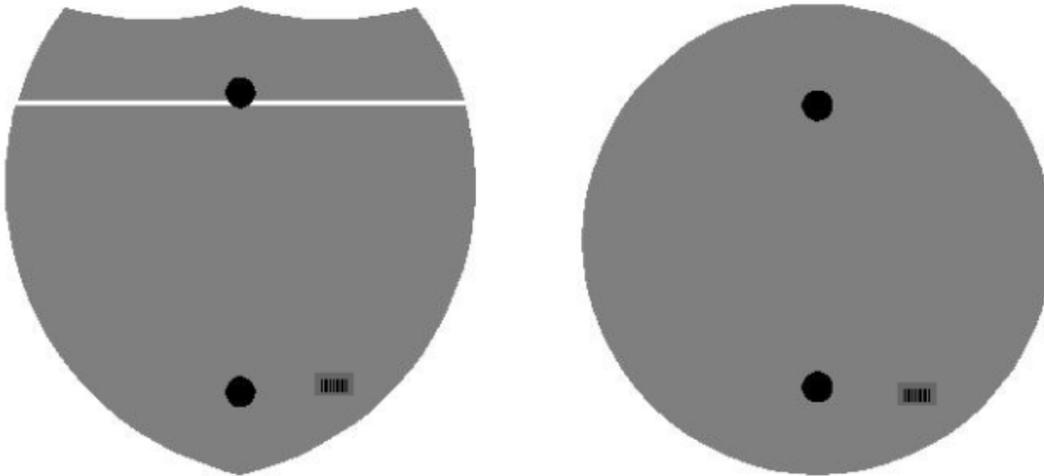
↑
2" Wide Post



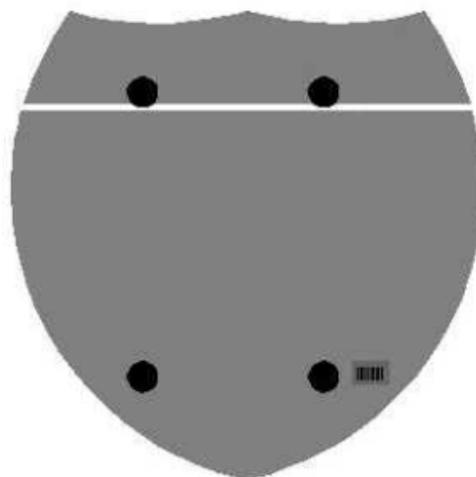
One Sign Post



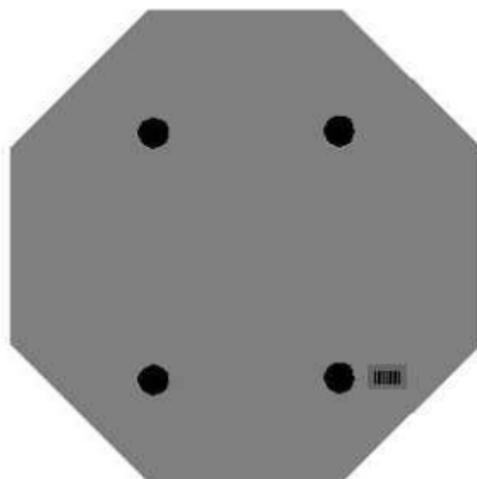
One Sign Post



Double Sign Post



Interstate
Shield

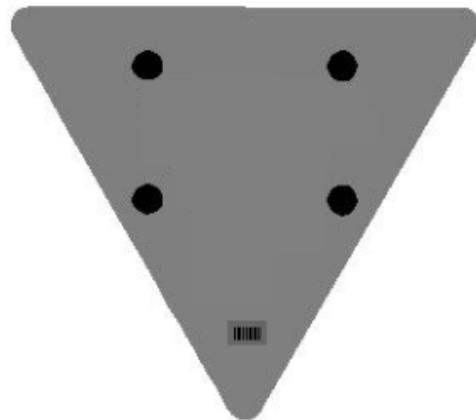


48" Stop

2 Post Signs



↑
2" Wide Post



PART III

EMPLOYMENT, WAGE AND RECORD REQUIREMENTS

FHWA-1273 -- Revised May 1, 2012

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar

with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions

of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

- (i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
- (ii) The classification is utilized in the area by the construction industry; and
- (iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or

will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program. Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-

Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly

rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

- (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
- (2) the prime contractor remains responsible for the quality of the work of the leased employees;
- (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
- (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is

evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. Instructions for Certification – First Tier Participants:

- a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this

covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

- (1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;
- (2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- (3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and
- (4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which

this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS
PREFERENCE FOR APPALACHIAN DEVELOPMENT
HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS
ROAD CONTRACTS**

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

**KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS**

**EMPLOYMENT REQUIREMENTS
RELATING TO
NONDISCRIMINATION OF EMPLOYEES
(APPLICABLE TO FEDERAL-AID SYSTEM CONTRACTS)**

**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 (between forty and seventy); 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 (between forty and seventy). 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, disability or age (between forty and seventy), except that such notice or advertisement may indicate a preference, limitation, or specification based on religion, or national origin when religion, or national origin is a bona fide occupational qualification for employment.

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 (between forty and seventy), 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 administering agency may direct as a means of enforcing such provisions, including sanctions for non-compliance.

REVISED: 12-3-92

Standard Title VI/Non-Discrimination Assurances

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “contractor”) agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, **Federal Highway Administration**, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.
3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor’s obligations under this contract and the Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin.
4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the **Federal Highway Administration** to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the Recipient or the **Federal Highway Administration**, as appropriate, and will set forth what efforts it has made to obtain the information.
5. **Sanctions for Noncompliance:** In the event of a contractor’s noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the **Federal Highway Administration** may determine to be appropriate, including, but not limited to:
 - a. withholding payments to the contractor under the contract until the contractor complies; and/or
 - b. cancelling, terminating, or suspending a contract, in whole or in part.
6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as the Recipient or the **Federal Highway Administration** may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

Standard Title VI/Non-Discrimination Statutes and Authorities

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “contractor”) agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21;
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 *et seq.*), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms “programs or activities” to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 -- 12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;
- The Federal Aviation Administration’s Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures non-discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 *et seq.*).

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 (6) provides:

No present or former public servant shall, within six (6) months of 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 the state in matters in which he was directly involved during 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, provided that, for a period of six (6) months, he personally refrains from working on any matter in which he was directly involved 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.

KRS 11A.040 (8) states:

A former public servant shall not represent a person in a matter before a state agency in which the former public servant was directly involved, 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, Room 136, Capitol Building, 700 Capitol Avenue, Frankfort, Kentucky 40601; telephone (502) 564-7954.

General Decision Number: KY150102 09/25/2015 KY102

Superseded General Decision Number: KY20140102

State: Kentucky

Construction Type: Highway

Counties: Allen, Ballard, Butler, Caldwell, Calloway, Carlisle, Christian, Crittenden, Daviess, Edmonson, Fulton, Graves, Hancock, Henderson, Hickman, Hopkins, Livingston, Logan, Lyon, Marshall, McCracken, McLean, Muhlenberg, Ohio, Simpson, Todd, Trigg, Union, Warren and Webster Counties in Kentucky.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Note: Executive Order (EO) 13658 establishes an hourly minimum wage of \$10.10 for 2015 that applies to all contracts subject to the Davis-Bacon Act for which the solicitation is issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.10 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/02/2015
1	01/30/2015
2	02/20/2015
3	02/27/2015
4	03/06/2015
5	03/20/2015
6	03/27/2015
7	05/01/2015
8	05/08/2015
9	05/22/2015
10	05/29/2015
11	06/05/2015
12	06/12/2015
13	06/19/2015
14	08/21/2015
15	09/04/2015
16	09/25/2015

BRIN0004-002 06/01/2015

BALLARD, BUTLER, CALDWELL, CARLISLE, CRITTENDEN, DAVIESS, EDMONSON, FULTON, GRAVES, HANCOCK, HENDERSON, HICKMAN, HOPKINS, LIVINGSTON, LYON, MARSHALL, MCCRACKEN, MCLEAN,

MUHLENBERG, OHIO, UNION, and WEBSTER COUNTIES

	Rates	Fringes
BRICKLAYER		
Ballard, Caldwell, Carlisle, Crittenden, Fulton, Graves, Hickman, Livingston, Lyon, Marshall, and McCracken Counties.....	\$ 29.52	13.37
Butler, Edmonson, Hopkins, Muhlenberg, and Ohio Counties.....	\$ 25.96	10.64
Daviess, Hancock, Henderson, McLean, Union, and Webster Counties.....	\$ 28.68	13.72

BRTN0004-005 06/01/2015

ALLEN, CALLOWAY, CHRISTIAN, LOGAN, SIMPSON, TODD, TRIGG, and
WARREN COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 25.96	10.64

CARP0357-002 05/01/2015

	Rates	Fringes
CARPENTER.....	\$ 27.50	16.02
Diver.....	\$ 41.63	16.02
PILEDRIVERMAN.....	\$ 27.75	16.02

ELEC0369-006 05/27/2015

BUTLER, EDMONSON, LOGAN, TODD & WARREN COUNTIES:

	Rates	Fringes
ELECTRICIAN.....	\$ 30.01	15.65

* ELEC0429-001 06/01/2015

ALLEN & SIMPSON COUNTIES:

	Rates	Fringes
ELECTRICIAN.....	\$ 24.84	11.90

ELEC0816-002 06/01/2015

BALLARD, CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN,
FULTON (Except a 5 mile radius of City Hall in Fulton), GRAVES,
HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCRACKEN & TRIGG COUNTIES:

	Rates	Fringes
ELECTRICIAN.....	\$ 31.03	25.5%+6.35

Cable spicers receive \$.25 per hour additional.

ELEC1701-003 01/01/2015

DAVIESS, HANCOCK, HENDERSON, HOPKINS, MCLEAN, MUHLENBERG, OHIO,
UNION & WEBSTER COUNTIES:

	Rates	Fringes
ELECTRICIAN.....	\$ 30.15	14.69

Cable spicers receive \$.25 per hour additional.

ELEC1925-002 01/01/2015

FULTON COUNTY (Up to a 5 mile radius of City Hall in Fulton):

	Rates	Fringes
CABLE SPLICER.....	\$ 25.00	10.27
ELECTRICIAN.....	\$ 24.55	11.51

ENGI0181-017 07/01/2015

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1.....	\$ 29.95	14.40
GROUP 2.....	\$ 27.26	14.40
GROUP 3.....	\$ 27.68	14.40
GROUP 4.....	\$ 26.96	14.40

OPERATING ENGINEER CLASSIFICATIONS

GROUP 1 - A-Frame Winch Truck; Auto Patrol; Backfiller; Batcher Plant; Bituminous Paver; Bituminous Transfer Machine; Boom Cat; Bulldozer; Mechanic; Cableway; Carry-All Scoop; Carry Deck Crane; Central Compressor Plant; Cherry Picker; Clamshell; Concrete Mixer (21 cu. ft. or Over); Concrete Paver; Truck-Mounted Concrete Pump; Core Drill; Crane; Crusher Plant; Derrick; Derrick Boat; Ditching & Trenching Machine; Dragline; Dredge Operator; Dredge Engineer; Elevating Grader & Loaders; Grade-All; Gurries; Heavy Equipment Robotics Operator/Mechanic; High Lift; Hoe-Type Machine; Hoist (Two or More Drums); Hoisting Engine (Two or More Drums); Horizontal Directional Drill Operator; Hydrocrane; Hyster; KeCal Loader; LeTourneau; Locomotive; Mechanic; Mechanically Operated Laser Screed; Mechanic Welder; Mucking Machine; Motor Scraper; Orangepeel Bucket; Overhead Crane; Piledriver; Power Blade; Pumpcrete; Push Dozer; Rock Spreader, attached to equipment; Rotary Drill; Roller (Bituminous); Rough Terrain Crane; Scarifier; Scoopmobile; Shovel; Side Boom; Subgrader; Tailboom; Telescoping Type Forklift; Tow or Push Boat; Tower Crane (French, German & other types); Tractor Shovel; Truck

Crane; Tunnel Mining Machines, including Moles, Shields or similar types of Tunnel Mining Equipment

GROUP 2 - Air Compressor (Over 900 cu. ft. per min.); Bituminous Mixer; Boom Type Tamping Machine; Bull Float; Concrete Mixer (Under 21 cu. ft.); Dredge Engineer; Electric Vibrator; Compactor/Self-Propelled Compactor; Elevator (One Drum or Buck Hoist); Elevator (When used to Hoist Building Material); Finish Machine; Firemen & Hoist (One Drum); Flexplane; Forklift (Regardless of Lift Height); Form Grader; Joint Sealing Machine; Outboard Motor Boat; Power Sweeper (Riding Type); Roller (Rock); Ross Carrier; Skid Mounted or Trailer Mounted Concrete Pump; Skid Steer Machine with all Attachments; Switchman or Brakeman; Throttle Valve Person; Tractair & Road Widening Trencher; Tractor (50 H.P. or Over); Truck Crane Oiler; Tugger; Welding Machine; Well Points;& Whirley Oiler

GROUP 3 -All Off Road Material Handling Equipment, including Articulating Dump Trucks; Greaser on Grease Facilities servicing Heavy Equipment

GROUP 4 - Bituminous Distributor; Burlap & Curing Machine; Cement Gun; Concrete Saw; Conveyor; Deckhand Oiler; Grout Pump; Hydraulic Post Driver; Hydro Seeder; Mud Jack; Oiler; Paving Joint Machine; Power Form Handling Equipment; Pump; Roller (Earth); Steerman; Tamping Machine; Tractor (Under 50 H.P.); & Vibrator

CRANES - with booms 150 ft. & Over (Including JIB), and where the length of the boom in combination with the length of the piling equals or exceeds 150 ft. - \$1.00 above Group 1 rate

EMPLOYEES ASSIGNED TO WORK BELOW GROUND LEVEL ARE TO BE PAID 10% ABOVE BASIC WAGE RATE. THIS DOES NOT APPLY TO OPEN CUT WORK.

IRON0070-005 06/01/2015

BUTLER COUNTY (Eastern eighth, including the Townships of Decker, Lee & Tilford);
EDMONSON COUNTY (Northern three-fourths, including the Townships of Asphalt, Bee Spring, Brownsville, Grassland, Huff, Kyrock, Lindseyville, Mammoth Cave, Ollie, Prosperity, Rhoda, Sunfish & Sweden)

	Rates	Fringes
IRONWORKER		
Structural; Ornamental;		
Reinforcing; Precast		
Concrete Erectors.....	\$ 27.56	20.30

IRON0103-004 08/01/2015

DAVISS, HANCOCK, HENDERSON, HOPKINS, MCLEAN, OHIO, UNION & WEBSTER COUNTIES

BUTLER COUNTY (Townships of Aberdeen, Bancock, Casey, Dexterville, Dunbar, Elfie, Gilstrap, Huntsville, Logansport, Monford, Morgantown, Provo, Rochester, South Hill & Welchs Creek);
 CALDWELL COUNTY (Northeastern third, including the Township of Creswell);
 CHRISTIAN COUNTY (Northern third, including the Townships of Apex, Crofton, Kelly, Mannington & Wynns);
 CRITTENDEN COUNTY (Northeastern half, including the Townships of Grove, Mattoon, Repton, Shady Grove & Tribune);
 MUHLENBERG COUNTY (Townships of Bavier, Beech Creek Junction, Benton, Brennen, Browder, Central City, Cleaton, Depoy, Drakesboro, Eunis, Graham, Hillside, Luzerne, Lynn City, Martwick, McNary, Millport, Moorman, Nelson, Paradise, Powderly, South Carrollton, Tarina & Weir)

	Rates	Fringes
Ironworkers:.....	\$ 28.14	18.675

IRON0492-003 05/01/2014		

ALLEN, LOGAN, SIMPSON, TODD & WARREN COUNTIES
 BUTLER COUNTY (Southern third, including the Townships of Boston, Berrys Lick, Dimple, Jetson, Quality, Sharer, Sugar Grove & Woodbury);
 CHRISTIAN COUNTY (Eastern two-thirds, including the Townships of Bennettstown, Casky, Herndon, Hopkinsville, Howell, Masonville, Pembroke & Thompsonville);
 EDMONSON COUNTY (Southern fourth, including the Townships of Chalybeate & Rocky Hill);
 MUHLENBERG COUNTY (Southern eighth, including the Townships of Dunnior, Penrod & Rosewood)

	Rates	Fringes
Ironworkers:.....	\$ 24.33	11.48

IRON0782-006 05/01/2014		

BALLARD, CALLOWAY, CARLISLE, FULTON, GRAVES, HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCRACKEN & TRIGG COUNTIES
 CALDWELL COUNTY (Southwestern two-thirds, including the Townships of Cedar Bluff, Cider, Claxton, Cobb, Crowtown, Dulaney, Farmersville, Fredonia, McGowan, Otter Pond & Princeton);
 CHRISTIAN COUNTY (Western third, Excluding the Townships of Apex, Crofton, Kelly, Mannington, Wynns, Bennettstown, Casky, Herndon, Hopkinsville, Howell, Masonville, Pembroke & Thompsonville);
 CRITTENDEN COUNTY (Southwestern half, including the Townships of Crayne, Dycusburg, Frances, Marion, Mexico, Midway, Sheridan & Told)

	Rates	Fringes
Ironworkers:		

Projects with a total contract cost of		
\$20,000,000.00 or above.....	\$ 27.09	20.66
All Other Work.....	\$ 25.50	19.02

LABO0189-005 07/01/2014

BALLARD, CALLOWAY, CARLISLE, FULTON, GRAVES, HICKMAN,
LIVINGSTON, LYON, MARSHALL & MCCRACKEN COUNTIES

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 21.50	12.26
GROUP 2.....	\$ 21.75	12.26
GROUP 3.....	\$ 21.80	12.26
GROUP 4.....	\$ 22.40	12.26

LABORER CLASSIFICATIONS

GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter Tender; Cement Mason Tender; Cleaning of Machines; Concrete; Demolition; Dredging; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level D; Flagperson; Grade Checker; Hand Digging & Hand Back Filling; Highway Marker Placer; Landscaping, Mesh Handler & Placer; Puddler; Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail & Fence Installer; Signal Person; Sound Barrier Installer; Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper; Wrecking of Concrete Forms; General Cleanup

GROUP 2 - Batter Board Man (Sanitary & Storm Sewer); Brickmason Tender; Mortar Mixer Operator; Scaffold Builder; Burner & Welder; Bushhammer; Chain Saw Operator; Concrete Saw Operator; Deckhand Scow Man; Dry Cement Handler; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level C; Forklift Operator for Masonary; Form Setter; Green Concrete Cutting; Hand Operated Grouter & Grinder Machine Operator; Jackhammer; Pavement Breaker; Paving Joint Machine; Pipelayer; Plastic Pipe Fusion; Power Driven Georgia Buggy & Wheel Barrow; Power Post Hole Digger; Precast Manhole Setter; Walk-Behind Tamper; Walk-Behind Trencher; Sand Blaster; Concrete Chipper; Surface Grinder; Vibrator Operator; Wagon Driller

GROUP 3 - Asphalt Luteman & Raker; Gunnite Nozzleman; Gunnite Operator & Mixer; Grout Pump Operator; Blaster; Side Rail Setter; Rail Paved Ditches; Screw Operator; Tunnel (Free Air); Water Blaster

GROUP 4 - Caisson Worker (Free Air); Cement Finisher; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Levels A & B; Miner & Driller (Free Air); Tunnel Blaster; & Tunnel Mucker (Free Air); Directional & Horizontal Boring; Air Track Drillers (All Types); Powdermen & Blasters; Troxler & Concrete Tester if Laborer is Utilized

LABO0189-006 07/01/2014

ALLEN, BUTLER, CALDWELL, CHRISTIAN, DAVIESS, EDMONSON, HANCOCK,
HOPKINS, LOGAN, MCLEAN, MUHLENBERG, OHIO, SIMPSON, TODD, TRIGG
& WARREN COUNTIES

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 22.66	11.10
GROUP 2.....	\$ 22.91	11.10
GROUP 3.....	\$ 22.96	11.10
GROUP 4.....	\$ 23.56	11.10

LABORER CLASSIFICATIONS

GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter Tender; Cement Mason Tender; Cleaning of Machines; Concrete; Demolition; Dredging; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level D; Flagperson; Grade Checker; Hand Digging & Hand Back Filling; Highway Marker Placer; Landscaping, Mesh Handler & Placer; Puddler; Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail & Fence Installer; Signal Person; Sound Barrier Installer; Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper; Wrecking of Concrete Forms; General Cleanup

GROUP 2 - Batter Board Man (Sanitary & Storm Sewer); Brickmason Tender; Mortar Mixer Operator; Scaffold Builder; Burner & Welder; Bushhammer; Chain Saw Operator; Concrete Saw Operator; Deckhand Scow Man; Dry Cement Handler; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level C; Forklift Operator for Masonary; Form Setter; Green Concrete Cutting; Hand Operated Grouter & Grinder Machine Operator; Jackhammer; Pavement Breaker; Paving Joint Machine; Pipelayer; Plastic Pipe Fusion; Power Driven Georgia Buggy & Wheel Barrow; Power Post Hole Digger; Precast Manhole Setter; Walk-Behind Tamper; Walk-Behind Trencher; Sand Blaster; Concrete Chipper; Surface Grinder; Vibrator Operator; Wagon Driller

GROUP 3 - Asphalt Luteman & Raker; Gunnite Nozzleman; Gunnite Operator & Mixer; Grout Pump Operator; Blaster; Side Rail Setter; Rail Paved Ditches; Screw Operator; Tunnel (Free Air); Water Blaster

GROUP 4 - Caisson Worker (Free Air); Cement Finisher; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Levels A & B; Miner & Driller (Free Air); Tunnel Blaster; & Tunnel Mucker (Free Air); Directional & Horizontal Boring; Air Track Drillers (All Types); Powdermen & Blasters; Troxler & Concrete Tester if Laborer is Utilized

LABO0561-001 07/01/2014

CRITTENDEN, HENDERSON, UNION & WEBSTER COUNTIES

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 21.36	12.65
GROUP 2.....	\$ 21.61	12.65
GROUP 3.....	\$ 21.66	12.65
GROUP 4.....	\$ 22.26	12.65

LABORER CLASSIFICATIONS

GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter Tender; Cement Mason Tender; Cleaning of Machines; Concrete; Demolition; Dredging; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level D; Flagperson; Grade Checker; Hand Digging & Hand Back Filling; Highway Marker Placer; Landscaping, Mesh Handler & Placer; Puddler; Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail & Fence Installer; Signal Person; Sound Barrier Installer; Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper; Wrecking of Concrete Forms; General Cleanup

GROUP 2 - Batter Board Man (Sanitary & Storm Sewer); Brickmason Tender; Mortar Mixer Operator; Scaffold Builder; Burner & Welder; Bushhammer; Chain Saw Operator; Concrete Saw Operator; Deckhand Scow Man; Dry Cement Handler; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level C; Forklift Operator for Masonary; Form Setter; Green Concrete Cutting; Hand Operated Grouter & Grinder Machine Operator; Jackhammer; Pavement Breaker; Paving Joint Machine; Pipelayer; Plastic Pipe Fusion; Power Driven Georgia Buggy & Wheel Barrow; Power Post Hole Digger; Precast Manhole Setter; Walk-Behind Tamper; Walk-Behind Trencher; Sand Blaster; Concrete Chipper; Surface Grinder; Vibrator Operator; Wagon Driller

GROUP 3 - Asphalt Luteman & Raker; Gunnite Nozzleman; Gunnite Operator & Mixer; Grout Pump Operator; Blaster; Side Rail Setter; Rail Paved Ditches; Screw Operator; Tunnel (Free Air); Water Blaster

GROUP 4 - Caisson Worker (Free Air); Cement Finisher; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Levels A & B; Miner & Driller (Free Air); Tunnel Blaster; & Tunnel Mucker (Free Air); Directional & Horizontal Boring; Air Track Drillers (All Types); Powdermen & Blasters; Troxler & Concrete Tester if Laborer is Utilized

PAIN0032-002 05/01/2015

BALLARD COUNTY

	Rates	Fringes
Painters:		
Bridges.....	\$ 32.56	15.18
All Other Work.....	\$ 30.26	15.18
Spray, Blast, Steam, High & Hazardous (Including Lead		

Abatement) and All Epoxy - \$1.00 Premium

PAIN0118-003 06/01/2014

EDMONSON COUNTY:

	Rates	Fringes
Painters:		
Brush & Roller.....	\$ 18.50	11.97
Spray, Sandblast, Power Tools, Waterblast & Steam Cleaning.....	\$ 19.50	11.97

PAIN0156-006 04/01/2015

DAVIESS, HANCOCK, HENDERSON, MCLEAN, OHIO, UNION & WEBSTER
COUNTIES

	Rates	Fringes
Painters:		
BRIDGES		
GROUP 1.....	\$ 27.60	12.85
GROUP 2.....	\$ 27.85	12.85
GROUP 3.....	\$ 28.60	12.85
GROUP 4.....	\$ 29.60	12.85
ALL OTHER WORK:		
GROUP 1.....	\$ 26.45	12.85
GROUP 2.....	\$ 26.70	12.85
GROUP 3.....	\$ 27.45	12.85
GROUP 4.....	\$ 28.45	12.85

PAINTER CLASSIFICATIONS

GROUP 1 - Brush & Roller

GROUP 2 - Plasterers

GROUP 3 - Spray; Sandblast; Power Tools; Waterblast;
Steamcleaning; Brush & Roller of Mastics, Creosotes, Kwinch
Koate & Coal Tar Epoxy

GROUP 4 - Spray of Mastics, Creosotes, Kwinch Koate & Coal
Tar Epoxy

PAIN0456-003 01/01/2015

ALLEN, BUTLER, LOGAN, MUHLENBERG, SIMPSON, TODD & WARREN
COUNTIES:

	Rates	Fringes
Painters:		
BRIDGES		
Brush & Roller.....	\$ 23.25	9.95

Spray; Sandblast; Power Tools; Waterblast & Steam Cleaning.....	\$ 24.25	9.95
ALL OTHER WORK		
Brush & Roller.....	\$ 19.25	9.95
Spray; Sandblast; Power Tools; Waterblast & Steam Cleaning.....	\$ 20.25	9.95

ALL OTHER WORK - HIGH TIME PAY
Over 35 feet (up to 100 feet) - \$1.00 above base wage
100 feet and over - \$2.00 above base wage

DURING SPRAY PAINTING AND SANDBLASTING OPERATIONS, POT
TENDERS SHALL RECEIVE THE SAME WAGE RATES AS THE SPRAY
PAINTER OR NOZZLE OPERATOR

PAIN0500-002 06/01/2015

CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN, FULTON,
GRAVES, HICKMAN, HOPKINS, LIVINGSTON, LYON, MARSHALL, MCCRACKEN
& TRIGG COUNTIES:

	Rates	Fringes
Painters:		
Bridges.....	\$ 26.85	12.35
All Other Work.....	\$ 20.60	12.35

Waterblasting units with 3500 PSI and above - \$.50 premium
Spraypainting and all abrasive blasting - \$1.00 premium
Work 40 ft. and above ground level - \$1.00 premium

PLUM0184-002 07/01/2013

BALLARD, CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN,
FULTON, GRAVES, HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCRACKEN
and TRIGG COUNTIES

	Rates	Fringes
Plumber; Steamfitter.....	\$ 33.11	14.83

PLUM0502-004 08/01/2013

ALLEN, BUTLER, EDMONSON, SIMPSON & WARREN

	Rates	Fringes
Plumber; Steamfitter.....	\$ 32.00	17.17

* PLUM0633-002 07/01/2015

DAVISS, HANCOCK, HENDERSON, HOPKINS, LOGAN, MCLEAN,
MUHLENBERG, OHIO, TODD, UNION & WEBSTER COUNTIES:

	Rates	Fringes
PLUMBER/PIPEFITTER.....	\$ 31.54	14.78

TEAM0089-003 03/30/2014		

ALLEN, BUTLER, EDMONSON, LOGAN, SIMPSON & WARREN COUNTIES

	Rates	Fringes
Truck drivers:		
Zone 1:		
Group 1.....	\$ 19.58	17.83
Group 2.....	\$ 19.76	17.83
Group 3.....	\$ 19.84	17.83
Group 4.....	\$ 19.86	17.83

GROUP 1 - Greaser; Tire Changer

GROUP 2 - Truck Mechanic; Single Axle Dump; Flat Bed; All Terrain Vehicles when used to haul materials; Semi Trailer or Pole Trailer when used to pull building materials and equipment; Tandem Axle Dump; Driver of Distributors

GROUP 3 - Mixer All Types

GROUP 4 - Winch and A-Frame when used in transporting materials; Ross Carrier; Fork Lift when used to transport building materials; Driver on Pavement Breaker; Euclid and Other Heavy Earth Moving Equipment; Low Boy; Articulator Cat; Five Axle Vehicle

 TEAM0215-003 03/31/2013

DAVISS, HANCOCK, HENDERSON, HOPKINS, MCLEAN, MUHLENBERG, OHIO & WEBSTER COUNTIES

	Rates	Fringes
TRUCK DRIVER		
Group 1.....	\$ 20.93	16.85
Group 2.....	\$ 21.16	16.85
Group 3.....	\$ 21.23	16.85
Group 4.....	\$ 21.24	16.85

GROUP 1: Greaser, Tire Changer

GROUP 2: Truck Mechanic

GROUP 3: Single Axle Dump; Flat Bed; All Terrain Vehicle when used to haul materials; Semi Trailer or Pole Trailer when used to pull building materials and equipment; Tandem Axle Dump; Driver of Distributors; Mixer All Types

GROUP 4: Euclid and other heavy earth moving equipment; Low Boy; Articulator Cat; 5 Axle Vehicle; Winch and A- Frame when used in transporting materials; Ross Carrier; Fork

Lift when used to transport building materials; Driver on Pavement Breaker

TEAM0236-001 03/31/2013

BALLARD, CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN, FULTON, GRAVES, HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCRACKEN, TODD & TRIGG COUNTIES

	Rates	Fringes
TRUCK DRIVER		
Group 1.....	\$ 19.38	16.85
Group 2.....	\$ 19.56	16.85
Group 3.....	\$ 19.56	16.85
Group 4.....	\$ 19.66	16.85
Group 5.....	\$ 19.64	16.85

GROUP 1: Greaser, Tire Changer

GROUP 2: Truck Mechanic

GROUP 3: Single Axle Dump; Flat Bed; All Terrain Vehicle when used to haul materials; Semi Trailer or Pole Trailer when used to pull building materials and equipment; Tandem Axle Dump; Drivers of Distributors

GROUP 4: Euclid and other heavy earth moving equipment; Low Boy; Articulator Cat; Five Axle Vehicle; Winch and A-Frame when used in transporting materials; Ross Carrier

GROUP 5: Mixer All Types

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.
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END OF GENERAL DECISION

Fringe benefit amounts are applicable for all hours worked except when otherwise noted.

These rates are listed pursuant to the Kentucky Determination No. CR-15-I-HWY dated July 20, 2015.

No laborer, workman or mechanic shall be paid at a rate less than that of a Journeyman except those classified as bona fide apprentices.

Apprentices or trainees shall be permitted to work as such subject to Administrative Regulations adopted by the Commissioner of Workplace Standards. Copies of these regulations will be furnished upon request from any interested person.

Before using apprentices on the job the contractor shall present to the Contracting Officer written evidence of registration of such employees in a program of a State apprenticeship and training agency approved and recognized by the U. S. Bureau of Apprenticeship and Training. In the absence of such a State agency, the contractor shall submit evidence of approval and registration by the U. S. Bureau of Apprenticeship and Training.

The contractor shall submit to the Contracting Officer, written evidence of the established apprenticeship-journeyman ratios and wage rates in the project area, which will be the basis for establishing such ratios and rates for the project under the applicable contract provisions.

TO: EMPLOYERS/EMPLOYEES

PREVAILING WAGE SCHEDULE:

The wages indicated on this wage schedule are the least permitted to be paid for the occupations indicated. When an employee works in more than one classification, the employer must record the number of hours worked in each classification at the prescribed hourly base rate.

OVERTIME:

Overtime is to be paid after an employee works eight (8) hours a day or forty (40) hours a week, whichever gives the employee the greater wages. At least time and one-half the base rate is required for all overtime. A laborer, workman or mechanic and an employer may enter into a written agreement or a collective bargaining agreement to work more than eight (8) hours a calendar day but not more than ten (10) hours a calendar day for the straight time hourly rate. Wage violations or questions should be directed to the designated Engineer or the undersigned.

Director
Division of Construction Procurement
Frankfort, Kentucky 40622
502-564-3500

**NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION
TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY
(Executive Order 11246)**

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area, are as follows:

GOALS FOR MINORITY PARTICIPATION IN EACH TRADE	GOALS FOR FEMALE PARTICIPATION IN EACH TRADE
12.0%	6.9%

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally-assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4, 3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within ten (10) working days of award of any construction subcontract in excess of \$10,000.00 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed. The notification shall be mailed to:

**Evelyn Teague, Regional Director
Office of Federal Contract Compliance Programs
61 Forsyth Street, SW, Suite 7B75
Atlanta, Georgia 30303-8609**

4. As used in this Notice, and in the contract resulting from this solicitation, the "**covered area**" is Simpson County.

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

151263

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Report Date 9/30/15

Section: 0001 - PAVING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00001		DGA BASE	41,735.00	TON		\$	
0020	00020		TRAFFIC BOUND BASE	558.00	TON		\$	
0030	00100		ASPHALT SEAL AGGREGATE	58.00	TON		\$	
0040	00103		ASPHALT SEAL COAT	7.00	TON		\$	
0050	00190		LEVELING & WEDGING PG64-22	2,000.00	TON		\$	
0060	00205		CL3 ASPH BASE 1.50D PG64-22	4,217.00	TON		\$	
0070	00214		CL3 ASPH BASE 1.00D PG64-22	17,738.00	TON		\$	
0080	00388		CL3 ASPH SURF 0.38B PG64-22	5,378.00	TON		\$	
0090	02084		JPC PAVEMENT-8 IN	159.00	SQYD		\$	
0100	02676		MOBILIZATION FOR MILL & TEXT	1.00	LS		\$	
0110	02677		ASPHALT PAVE MILLING & TEXTURING	1,000.00	TON		\$	

Section: 0002 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0120	00078		CRUSHED AGGREGATE SIZE NO 2	21,160.00	TON		\$	
0130	01984		DELINEATOR FOR BARRIER - WHITE	8.00	EACH		\$	
0140	01985		DELINEATOR FOR BARRIER - YELLOW	8.00	EACH		\$	
0150	01987		DELINEATOR FOR GUARDRAIL BI DIRECTIONAL WHITE	65.00	EACH		\$	
0160	01992		INSTALL TEMP CONC MED BARR	150.00	LF		\$	
0170	02014		BARRICADE-TYPE III	6.00	EACH		\$	
0180	02091		REMOVE PAVEMENT	522.00	SQYD		\$	
0190	02159		TEMP DITCH	4,750.00	LF		\$	
0200	02160		CLEAN TEMP DITCH	2,375.00	LF		\$	
0210	02223		GRANULAR EMBANKMENT	100.00	CUYD		\$	
0220	02230		EMBANKMENT IN PLACE	62,287.00	CUYD		\$	
0230	02242		WATER	100.00	MGAL		\$	
0240	02351		GUARDRAIL-STEEL W BEAM-S FACE	3,725.00	LF		\$	
0250	02360		GUARDRAIL TERMINAL SECTION NO 1	11.00	EACH		\$	
0260	02371		GUARDRAIL END TREATMENT TYPE 7	5.00	EACH		\$	
0270	02391		GUARDRAIL END TREATMENT TYPE 4A	11.00	EACH		\$	
0280	02397		TEMP GUARDRAIL	1,225.00	LF		\$	
0290	02429		RIGHT-OF-WAY MONUMENT TYPE 1	49.00	EACH		\$	
0300	02432		WITNESS POST	19.00	EACH		\$	
0310	02469		CLEAN SINKHOLE	3.00	EACH		\$	
0320	02483		CHANNEL LINING CLASS II	311.00	TON		\$	
0330	02545		CLEARING AND GRUBBING (APPROXIMATELY 25.37 ACRES)	1.00	LS		\$	
0340	02555		CONCRETE-CLASS B	10.00	CUYD		\$	
0350	02562		TEMPORARY SIGNS	1,000.00	SQFT		\$	
0360	02585		EDGE KEY	100.00	LF		\$	
0370	02599		FABRIC-GEOTEXTILE TYPE IV	62,300.00	SQYD		\$	
0380	02625		REMOVE HEADWALL	4.00	EACH		\$	
0390	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		\$	
0400	02651		DIVERSIONS (BY-PASS DETOURS)	1.00	LS		\$	
0410	02671		PORTABLE CHANGEABLE MESSAGE SIGN	2.00	EACH		\$	

PROPOSAL BID ITEMS

151263

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Report Date 9/30/15

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0420	02690		SAFELoADING	78.80	CUYD		\$	
0430	02696		SHOULDER RUMBLE STRIPS-SAWED	19,000.00	LF		\$	
0440	02701		TEMP SILT FENCE	2,375.00	LF		\$	
0450	02703		SILT TRAP TYPE A	26.00	EACH		\$	
0460	02704		SILT TRAP TYPE B	26.00	EACH		\$	
0470	02705		SILT TRAP TYPE C	26.00	EACH		\$	
0480	02706		CLEAN SILT TRAP TYPE A	26.00	EACH		\$	
0490	02707		CLEAN SILT TRAP TYPE B	26.00	EACH		\$	
0500	02708		CLEAN SILT TRAP TYPE C	26.00	EACH		\$	
0510	02726		STAKING	1.00	LS		\$	
0520	02731		REMOVE STRUCTURE	1.00	LS		\$	
0530	03171		CONCRETE BARRIER WALL TYPE 9T	150.00	LF		\$	
0540	05950		EROSION CONTROL BLANKET	32,387.00	SQYD		\$	
0550	05952		TEMP MULCH	122,787.00	SQYD		\$	
0560	05963		INITIAL FERTILIZER	6.90	TON		\$	
0570	05964		20-10-10 FERTILIZER	3.50	TON		\$	
0580	05985		SEEDING AND PROTECTION	61,000.00	SQYD		\$	
0590	05992		AGRICULTURAL LIMESTONE	41.00	TON		\$	
0600	06510		PAVE STRIPING-TEMP PAINT-4 IN	46,472.00	LF		\$	
0610	06514		PAVE STRIPING-PERM PAINT-4 IN	46,472.00	LF		\$	
0620	06568		PAVE MARKING-THERMO STOP BAR-24IN	36.00	LF		\$	
0630	06572		PAVE MARKING-DOTTED LANE EXTEN	48.00	LF		\$	
0640	06574		PAVE MARKING-THERMO CURV ARROW	50.00	EACH		\$	
0650	06588		PAVEMENT MARKER TY IVA-BY TEMP	70.00	EACH		\$	
0660	06589		PAVEMENT MARKER TYPE V-MW	8.00	EACH		\$	
0670	06591		PAVEMENT MARKER TYPE V-BY	464.00	EACH		\$	
0680	06600		REMOVE PAVEMENT MARKER TYPE V	300.00	EACH		\$	
0690	08150		STEEL REINFORCEMENT	50.00	LB		\$	
0700	10020NS		FUEL ADJUSTMENT	75,828.00	DOLL	\$1.00	\$	\$75,828.00
0710	10030NS		ASPHALT ADJUSTMENT	115,192.00	DOLL	\$1.00	\$	\$115,192.00
0720	20738NS112		TEMP CRASH CUSHION	2.00	EACH		\$	
0730	23139EN		STRIPING REMOVAL	46,472.00	LF		\$	
0740	23274EN11F		TURF REINFORCEMENT MAT 1	1,691.00	SQYD		\$	
0750	24540		R/W MONUMENT TYPE 3	5.00	EACH		\$	
0760	24784EC		INSTALL GEOGRID REINFORCEMENT FOR ASPH	30,000.00	SQYD		\$	

Section: 0003 - DRAINAGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0770	00440		ENTRANCE PIPE-15 IN	768.00	LF		\$	
0780	00441		ENTRANCE PIPE-18 IN	816.50	LF		\$	
0790	00443		ENTRANCE PIPE-24 IN	431.00	LF		\$	
0800	00462		CULVERT PIPE-18 IN	58.00	LF		\$	
0810	00464		CULVERT PIPE-24 IN	7.00	LF		\$	
0820	00466		CULVERT PIPE-30 IN	130.00	LF		\$	
0830	00468		CULVERT PIPE-36 IN	125.50	LF		\$	
0840	00471		CULVERT PIPE-54 IN	42.00	LF		\$	
0850	01000		PERFORATED PIPE-4 IN	5,580.00	LF		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0860	01020		PERF PIPE HEADWALL TY 1-4 IN	9.00	EACH		\$	
0870	01024		PERF PIPE HEADWALL TY 2-4 IN	2.00	EACH		\$	
0880	01028		PERF PIPE HEADWALL TY 3-4 IN	8.00	EACH		\$	
0890	01208		PIPE CULVERT HEADWALL-24 IN	2.00	EACH		\$	
0900	01210		PIPE CULVERT HEADWALL-30 IN	4.00	EACH		\$	
0910	01212		PIPE CULVERT HEADWALL-36 IN	7.00	EACH		\$	
0920	01310		REMOVE PIPE	53.00	LF		\$	
0930	01450		S & F BOX INLET-OUTLET-18 IN	2.00	EACH		\$	
0940	01451		S & F BOX INLET-OUTLET-24 IN	1.00	EACH		\$	
0950	01453		S & F BOX INLET-OUTLET-36 IN	1.00	EACH		\$	
0960	01644		JUNCTION BOX-30 IN	1.00	EACH		\$	
0970	02600		FABRIC GEOTEXTILE TY IV FOR PIPE	540.00	SQYD	\$2.00	\$	\$1,080.00
0980	03260		CLEAN ROADWAY DRAINS	4.00	EACH		\$	
0990	08100		CONCRETE-CLASS A	19.31	CUYD		\$	
1000	20597EC		DITCH EXCAVATION	29.10	CUYD		\$	
1010	21799EN		BORE AND JACK PIPE-24 IN	101.00	LF		\$	
1020	21800EN		BORE AND JACK PIPE-30 IN	216.20	LF		\$	
1030	23126EN		BORE AND JACK PIPE-18 IN	58.00	LF		\$	
1040	24026EC		PIPE CULVERT HEADWALL-54 IN	2.00	EACH		\$	
1050	24186EC		BORE AND JACK PIPE-36 IN	229.00	LF		\$	
1060	24814EC		PIPELINE INSPECTION	848.50	LF		\$	

Section: 0004 - BRIDGE - CULVERT- SHARPS BRANCH - DWG. 27027

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1070	08002		STRUCTURE EXCAV-SOLID ROCK	13.00	CUYD		\$	
1080	08003		FOUNDATION PREPARATION	1.00	LS		\$	
1090	08100		CONCRETE-CLASS A	554.20	CUYD		\$	
1100	08150		STEEL REINFORCEMENT	85,135.00	LB		\$	

Section: 0005 - SEWER

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1110	01052		SEWER PIPE-8 IN (GRAVITY, PVC)	17.00	LF		\$	
1120	01053		SEWER PIPE-10 IN (GRAVITY, PVC)	781.00	LF		\$	
1130	01063		STEEL ENCASMENT PIPE-6 IN (OPEN CUT)	5.00	LF		\$	
1140	01080		STEEL ENCASMENT PIPE-BORE&JACK-20 IN	205.00	LF		\$	
1150	03442		DUCTILE IRON FITTINGS	678.00	LB		\$	
1160	15594		S PUMP STATION INST (NEW WASTEWATER PUMP STATION INCLUDING ALL ITEMS)	1.00	EACH		\$	
1170	20371EC		CUT AND CAP SANITARY SEWER	10.00	EACH		\$	
1180	20423EC		WATERTIGHT FRAME AND LID	2.00	EACH		\$	
1190	20424EC		CONNECT TO EXIST MANHOLE (GRAVITY PIPE)	4.00	EACH		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1200	21191ND		ABANDON WASTEWATER PUMP STATION	1.00	EACH		\$	
1210	21354ND		CUT CAP AND BLOCK FORCE MAIN (6-IN)	6.00	EACH		\$	
1220	21788ED		OPEN CUT W/ STEEL ENCASEMENT (20 INCH)	85.00	LF		\$	
1230	21918NN		MANHOLE-4 FT (0-6-FT)	7.00	EACH		\$	
1240	21921EN		MANHOLE-4 FT BARREL EXTENSION (VERTICAL FEET ABOVE 6-FT DEPTH)	39.00	VTFT		\$	
1250	22783NN		CONNECT TO FORCE MAIN-6 IN	4.00	EACH		\$	
1260	22801NN		ABANDON AND SAFELOAD MANHOLE (EXISTING)	6.00	EACH		\$	
1270	22871NN		CONNECT TO 2 IN (FORCE MAIN)	1.00	EACH		\$	
1280	23013EN		SANITARY SEWER FORCE MAIN (PVC 6 INCH)	724.00	LF		\$	
1290	23013EN		SANITARY SEWER FORCE MAIN (PVC 2 INCH)	77.00	LF		\$	
1300	23669EC		GRAVITY SEWER CREEK CROSSING	40.00	LF		\$	
1310	23716EC		CONNECT TO NEW MANHOLE (FORCE MAIN)	2.00	EACH		\$	
1320	23924EC		RECONNECT LATERAL TO MANHOLE	1.00	EACH		\$	
1330	24411EC		CONST NEW MANHOLE OVER EXIST SEWER (VERTICAL FEET ABOVE 6-FT DEPTH)	17.00	EACH		\$	
1340	24411EC		CONST NEW MANHOLE OVER EXIST SEWER (4 FT. DIA, 0 TO 6 FT)	5.00	EACH		\$	

Section: 0006 - SIGNING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1350	04903		REFERENCE MARKER	4.00	EACH		\$	
1360	06406		SBM ALUM SHEET SIGNS .080 IN	48.00	SQFT		\$	
1370	06407		SBM ALUM SHEET SIGNS .125 IN	59.00	SQFT		\$	
1380	06410		STEEL POST TYPE 1	258.00	LF		\$	
1390	24631EC		BARCODE SIGN INVENTORY	18.00	EACH		\$	

Section: 0007 - WATERLINE - RELOCATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1400	14003		W CAP EXISTING MAIN	1.00	EACH		\$	
1410	14081		W SERVICE RELOCATE (CUSTOMER SERVICE LINE)	1.00	EACH		\$	
1420	14085		W SERV PE/PLST SHORT SIDE 3/4 IN (PE SERVICE LINE)	1.00	EACH		\$	
1430	14090		W TAPPING SLEEVE AND VALVE SIZE 2 (10-IN X 10-IN ON PVC)	1.00	EACH		\$	
1440	14096		W TIE-IN 10 INCH (CONNECT TO EXISTING PVC WATERLINE)	1.00	EACH		\$	
1450	14131		W METER SPECIAL (5/8-IN)	1.00	EACH		\$	
1460	14548		W PIPE PVC 10 INCH INST (CLASS 200)	740.00	LF		\$	

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Section: 0008 - DEMOBILIZATION &/OR MOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1470	02568		MOBILIZATION	1.00	LS		\$	
1480	02569		DEMOBILIZATION	1.00	LS		\$	