CALL NO. 104

CONTRACT ID. 181033

BOONE COUNTY

FED/STATE PROJECT NUMBER STP 8200(017)

DESCRIPTION KY-237

WORK TYPE GRADE, DRAIN & SURFACE WITH BRIDGE

PRIMARY COMPLETION DATE 11/30/2020

LETTING DATE: September 21,2018

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 AM EASTERN DAYLIGHT TIME September 21,2018. Bids will be publicly announced at 10:00 AM EASTERN DAYLIGHT TIME.

PLANS AVAILABLE FOR THIS PROJECT.

DBE CERTIFICATION REQUIRED - 8%

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

TABLE OF CONTENTS

PART I

SCOPE OF WORK

ADMINISTRATIVE DISTRICT - 06

CONTRACT ID - 181033

STP 8200(017)

COUNTY - BOONE

PCN - DE00802371825
STP 8200(017)

KY-237 RECONSTRUCT AND WIDEN KY-237 FROM VALLEY VIEW DRIVE TO ROGERS LANE, A DISTANCE OF 03.10 MILES.GRADE, DRAIN & SURFACE WITH BRIDGE SYP NO. 06-08001.21.

GEOGRAPHIC COORDINATES LATITUDE 38:59:18.00 LONGITUDE 84:41:41.00

COMPLETION DATE(S):

COMPLETED BY 11/30/2020 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 electronic bidding software. 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 shall make every effort to protect underground facilities from damage as prescribed in the Underground Facility Damage Protection Act of 1994, Kentucky Revised Statute KRS 367.4901 to 367.4917. It is the contractor's responsibility to determine and take steps necessary to be in compliance with federal and state damage prevention directives. When prescribed in said directives, the contractor shall submit Excavation Locate Requests to the Kentucky Contact Center (KY811) via web ticket entry. The submission of this request does not relieve the contractor from the responsibility of contacting non-member facility owners, whom shall be contacted through their individual Protection Notification Center. Non-compliance with these directives can result in the enforcement of penalties.

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.

April 30, 2018

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
102.8 Irregular Proposals 102.14 Disqualification of Bidders
102.9 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 5 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 certainly 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 our 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 complete and submit a signed and notarized affidavit (TC 18-7) and copies of checks for any monies paid to each DBE subcontractor or supplier utilized to meet a DBE goal. These documents must be submitted within 10 days of being paid by the Cabinet.

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, signed and notarized affidavit must be submitted by the Prime Contractor 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.

1/27/2017

LEGAL REQUIREMENTS AND RESPONSIBILITY TO THE PUBLIC – CARGO PREFERENCE ACT (CPA).

(REV 12-17-15) (1-16)

SECTION 7 is expanded by the following new Article:

102.10 **Cargo Preference Act – Use of United States-flag vessels.**

Pursuant to Title 46CFR Part 381, the Contractor agrees

- To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.
- To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph 1 of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.
- To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract.

PROJECT TRAFFIC COORDINATOR (PTC)

Be advised this project is a significant project pursuant to section 112.03.12.

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.

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.

ASPHALT PAVEMENT RIDE QUALITY CATEGORY B

The Department will apply Pavement Rideability Requirements on this project in accordance with Section 410, Category B.

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.

SPECIAL NOTE FOR INTELLIGENT COMPACTION OF ASPHALT MIXTURES

This Special Note will apply when indicated on the plans or in the proposal. Section references herein are to the Department's Standard Specifications for Road and Bridge Construction current edition.

1.0 DESCRIPTION. Provide and use Intelligent Compaction (IC) Rollers for compaction of all asphalt mixtures.

2.0 MATERIALS AND EQUIPMENT. In addition to the equipment specified in Subsection 403.02, a minimum of one (1) IC roller is to be used on the project at all times, two (2) IC rollers will be required when the paving train consists of three (3) or more rollers. The Contractor is to only the IC roller(s) for compaction as the breakdown and/or intermediate roller(s). All IC rollers will meet the following minimum characteristics:

1) Are self propelled double-drum vibratory rollers equipped with accelerometers mounted in or about the drum to measure the interactions between the rollers and compacted materials in order to evaluate the applied compactive effort. The IC rollers must have the approval of the Engineer prior to use. Examples of rollers equipped with IC technology can be found at www.IntelligentCompaction.com.

2) Are equipped with non-contact temperature sensors for measuring pavement surface temperatures.

3) The output from the roller is designated as the IC-MV which represents the stiffness of the materials based on the vibration of the roller drums and the resulting response from the underlying materials.

4) Are equipped with integrated on-board documentation systems that are capable of displaying real-time color-coded maps of IC measurement values including the stiffness response values, location of the roller, number of roller passes, machine settings, together with the material temperature, speed and the frequency and amplitude of roller drums. Ensure the display unit is capable of transferring the data by means of a USB port.

5) Are equipped with a mounted Global Positioning System GPS radio and receiver either a Real Time Kinematic (RTK-GPS) or Global Navigational Satellite System (GNSS) units that monitor the location and track the number of passes of the rollers. Accuracy of the positioning system is to be a minimum of 12 inches.

3.0 WORK PLAN. Submit to the Engineer an IC Work Plan at the Preconstruction Conference and at least 2 weeks prior to the beginning construction. Describe in the work plan the following:

1. Compaction equipment to be used including:
   - Vendor(s)
   - Roller model(s),
   - Roller dimensions and weights,
   - Description of IC measurement system,
   - GPS capabilities,
   - Documentation system,
   - Temperature measurement system, and
   - Software.

2. Roller data collection methods including sampling rates and intervals and data file types.

3. Transfer of data to the Engineer including method, timing, and personnel responsible. Data transfer shall be provided by a real time cloud data collecting and distribution system (ex. Visionlink). The Contractor will provide the Cabinet with any vendor specific software, user id, passwords, etc. needed to access the data through this service, cost of this access is incidental to the IC bid item.

4. Training plan and schedule for roller operators, project foreman, project surveyors, and Cabinet personnel; including both classroom and field training. Training should be conducted at least 1 week before beginning IC

construction. The training is to be performed by a qualified representative(s) from the IC Roller manufacture(s) to be used on the project. This training shall include how to access and use the data from the cloud data source.

4.0 CONSTRUCTION. Do not begin work until the Engineer has approved the IC submittals and the IC equipment.

Follow requirements established in Section 400 for production and placement, materials, equipment, acceptance plans and adjustments except as noted or modified in this Specification. Provide the Engineer at least one day's notice prior to beginning construction or prior to resuming production if operations have been temporarily suspended. Ensure paving equipment complies with all requirements specified in Section 400. The IC roller temperatures will be evaluated by the Department with the data from a Paver Mounted Infrared Temperature Gauge.

A. Pre-Construction Test Section(s) Requirements

1. Prior to the start of production, ensure the proper setup of the GPS, IC roller(s) and the rover(s) by conducting joint GPS correlation and verification testing between the Contractor, GPS representative and IC roller manufacturer using the same datum.

1. Ensure GPS correlation and verification testing includes the following minimum processes:

    a. Establish the GPS system to be used either one with a base station or one with mobile receivers only. Ensure all components in the system are set to the correct coordinate system; then,

    b. Verify that the roller and rover are working properly and that there is a connection with the base station; then,

    c. Record the coordinates of the two edges where the front drum of the roller is in contact with the ground from the on-board, color-coded display; then,

    d. Mark the locations of the roller drum edges and move the roller, and place the mobile receiver at each mark and record the readings; then,

2. Compare coordinates between the roller and rover receivers. If the coordinates are within 12.0 in. of each other, the comparison is acceptable. If the coordinates are not within 12.0 in., diagnose and perform necessary corrections and repeat the above steps until verification is acceptable.

3. Do not begin work until acceptable GPS correlation and verification has been obtained.

4. The Contractor and the Department should conduct random GPS verification testing during production to ensure data locations are accurate. The recommended rate is once per day with a requirement of at least once per week.

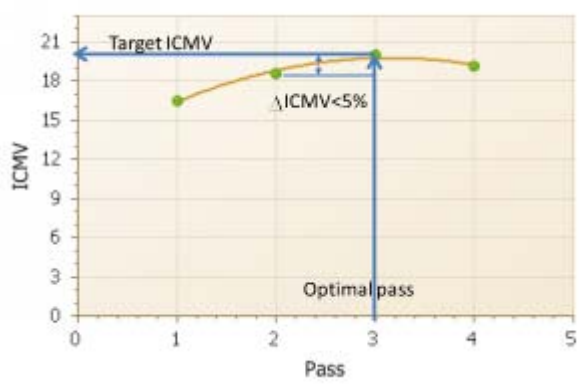
5. All acceptance testing shall be as outlined in Standard Specifications section 400.

B. Construction Test Section(s) Requirements

Construct test section(s) at location(s) agreed on by the Contractor and the Engineer within the project limits. The test section is required to determine a compaction curve of the asphalt mixtures in relationship to number of roller passes and to the stiffness of mixture while meeting the Department in-place compaction requirements. All rollers and the respective number of passes for each is to be determined via control strip each time a material change, equipment change or when the Engineer deems necessary.

Conduct test section(s) on every lift and every asphalt mixture. Ensure test section quantities of 500 to 1,000 tons of mainline mixtures. Operate IC rollers in the low to medium amplitude range and at the same settings (speed, frequency) throughout the section while minimizing overlapping of the roller, **the settings are to be used throughout the project with no changes.** After each roller pass, the qualified technician from the contractor observed by the Department will use a nondestructive nuclear gauge that has been calibrated to the mixture to estimate the density of the asphalt at 10 locations uniformly spaced throughout the test section within the width of a single roller pass. The density readings and the number

of roller passes needed to achieve the specified compaction will be recorded. The estimated target density will be the peak of the average of the nondestructive readings within the desired compaction temperature range for the mixture. The IC roller data in conjunction with the Veda software will create an IC compaction curve for the mixture. The target IC-MV is the point when the increase in the IC-MV of the material between passes is less than 5 percent on the compaction curve. The IC compaction curve is defined as the relationship between the IC-MV and the roller passes. A compaction curve example is as follows:



Subsequent to the determination of the target IC-MV, compact an adjoining > 250 < 500 tons section using same roller settings and the number of estimated roller passes and allow the Department to verify the compaction with the same calibrated nondestructive nuclear gauge following the final roller pass. **The Department will obtain density readings at 10 locations (No cores for calibration are to be taken in the surface layer, use non-destructive density results only!!)** uniformly spaced throughout the test section within the width of the single roller. Obtain GPS measurement of the core locations with a GPS rover. Use the Veda software to perform least square linear regression between the core data and IC-MV in order to correlate the production IC-MV values to the Department specified in-place air voids. A sample linear regression curve example is as follows.

C. Construction Requirements

Use the IC roller on all lifts and types of asphalt within the limits of the project, with the exception of asphalt drainage blanket.

Ensure the optimal number of roller passes determined from the test sections has been applied to a minimum coverage of 80% of the individual IC Construction area. Ensure a minimum of 75% of the individual IC Construction area meets the target IC-MV values determined from the test sections.

Do not continue paving operations if IC Construction areas not meeting the IC criteria are produced until they have been investigated by the Department. Obtain the Engineer's approval to resume paving operations. Non-IC rollers are allowed to be used as the third roller on the project; one of the breakdown or the finish rollers is to be equipped with IC technology.

IC Construction areas are defined as subsections of the project being worked continuously by the Contractor. The magnitude of the IC Construction areas may vary with production but must be at least 750 tons per mixture for evaluation. Partial IC Construction areas of < 750 tons will be included in the previous area evaluation. IC Construction areas may extend over multiple days depending on the operations.

The IC Construction Operations Criteria does not affect the Department's acceptance processes for the materials or construction operations

5.0 MEASUREMENT. The Department will measure the total tons of asphalt mixtures compacted using the IC roller(s). Compaction is to be performed by a minimum of one (1) IC roller for a two (2) roller operation and a minimum of two (2) IC rollers when three (3) or more rollers are used for compaction. Material compacted by rollers not equipped with properly functioning IC equipment will not be accepted for payment of the bid item asphalt mixtures IC rolled. Use of non-IC rollers can be accepted on small areas due to equipment malfunctions at the written approval of the Engineer. Paving operations should be suspended for equipment malfunctions that will extend over three days of operation.

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

1. Payment is full compensation for all work associated with providing IC equipped rollers, transmission of electronic data files, two copies of IC roller manufacturer software, and training.

2. Delays due to GPS satellite reception of signals to operate the IC equipment or IC roller breakdowns will not be considered justification for contract modifications or contract extensions.

Code	Pay Item	Pay Unit
24781EC	Intelligent Compaction for Asphalt	TON

SPECIAL NOTE FOR INTELLIGENT COMPACTION OF AGGREGATE BASES AND SOILS

This Special Note will apply when indicated on the plans or in the proposal. Section references herein are to the Department's current edition of the Standard Specifications for Road and Bridge Construction.

1.0 DESCRIPTION. Provide and use Intelligent Compaction (IC) Rollers for compaction of Aggregate bases, stabilized subgrades, soil, and soil rock mixtures.

2.0 MATERIALS AND EQUIPMENT. The Contractor shall supply sufficient numbers of rollers and other associated equipment necessary to complete the compaction requirements for the specific materials. The Contractor will determine the number of IC rollers to use depending on the scope of the project. The IC roller(s) may be utilized during production with other standard compaction equipment and shall be used for the evaluation of the compaction operations. Provide at least one (1) roller to be used on the project with the following minimum characteristics:

1) Are self propelled vibratory rollers equipped with machine drive power and/or accelerometers mounted in or about the drum to measure the interactions between the rollers and compacted materials in order to evaluate the applied Compactive effort. www.IntelligentCompaction.com contains a list of acceptable rollers equipped with IC technology.

2) IC rollers can be either smooth drums or pad footed drums based on the type needed for the aggregate base or soil types to compact.

3) The output from the roller is designated as the IC-MV which represents the stiffness of the materials based on the vibration of the roller drums and the resulting response from the underlying materials, or the machine drive power value.

4) Are equipped with integrated on-board documentation systems that are capable of displaying real-time color-coded maps of IC measurement values including the stiffness response values, location of the roller, number of roller passes, machine settings, together with the speed, the frequency and amplitude of roller drums. Ensure the display unit is capable of transferring the data by means of a USB port.

5) Are equipped with a mounted Global Positioning System GPS radio and receiver either a Real Time Kinematic (RTK-GPS) or Global Navigational Satellite System (GNSS) units that monitor the location and track the number of passes of the rollers. Accuracy of the positioning system must be within 12 inches.

3.0 WORK PLAN. Submit to the Engineer an IC Work Plan at the Preconstruction Conference and/or at least 2 weeks prior to beginning the corresponding construction activates. Describe in the work plan the following:

1. Compaction equipment to be used including:
    - Vendor(s)

- Roller model(s),
- Roller dimensions and weights,
- Description of IC measurement system,
- GPS capabilities,
- Documentation system,
- Software.

2. Roller data collection methods including sampling rates and intervals and data file types.

3. Transfer of data to the Engineer including method, timing, and personnel responsible. Data transfer shall be provided by a real time cloud data collecting and distribution system (ex. Visionlink). The Contractor will provide the Cabinet with any vendor specific software, user id, passwords, etc. needed to access the data through this service, cost of this access is incidental to the IC bid item(s).

4. Training plan and schedule for roller operators, project foreman, project surveyors, and Cabinet personnel; including both classroom and field training from the equipment manufacturer. Training should be conducted at least 1 week before beginning IC construction. The training is to be performed by a qualified representative(s) from the IC Roller manufacture(s) to be used on the project.

4.0 CONSTRUCTION. Prior to the start of production, ensure the proper setup of the GPS, IC roller(s) and the rover(s) by conducting joint GPS correlation and verification testing between the Contractor, GPS representative and IC roller manufacturer using the same datum. Use the project datum system (Northing, Easting and Elevation) when applicable.

1. Ensure GPS correlation and verification testing includes the following minimum processes:

    a. Establish the GPS system to be used either one with a base station or one with mobile receivers only. Ensure all components in the system are set to the correct coordinate system; then,

    b. Verify that the roller and rover are working properly and that there is a connection with the base station; then,

    c. Record the coordinates of the two edges where the front drum of the roller is in contact with the ground from the on-board, color-coded display; then,

    d. Mark the locations of the roller drum edges and move the roller, and place the mobile receiver at each mark and record the readings; then; then,

2. Compare coordinates between the roller and rover receivers. If the coordinates are within12.0 in. of each other, the comparison is acceptable. If the coordinates are not within 12.0 in., diagnose and perform necessary corrections and repeat the above steps until verification is acceptable.

3. Do not begin work until acceptable GPS correlation and verification has been obtained. The Contractor and the Department should conduct random GPS verification testing during production to ensure data locations are accurate. The recommended rate is once per day with a requirement of at least once per week.

4. A test strip is to be used for all materials (DGA, CSB, subgrade and soil) as outlined and sized in section 302.03.04 to determine optimum rolling pattern, for all materials, and the target density for aggregate bases. A new test strip will be required anytime the material changes, equipment changes, or proper compaction has not been obtained for two (2) consecutive test locations.

5. All acceptance testing shall be as outlined in Standard Specifications sections 200 and 300.

6. Any areas a minimum of 50 square feet in area not achieving the 80% of the stiffness value determined by the latest control strip shall be tested by other means approved by the Engineer. If the material doesn't pass the testing is shall be repaired based on current standards to the satisfaction of the Engineer.

5.0 MEASUREMENT. The Department will measure the total tons of aggregate base (DGA and/or CSB), total square yards of stabilized subgrade, and total cubic yards of soil compacted using the IC roller(s). The use of non-IC rollers is allowed on this project, but an IC roller must be used as well.

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

1. All areas with a minimum of 80% pass coverage and 75% required stiffness readings.

2. Payment is full compensation for all work associated with providing IC equipped rollers, transmission of electronic data files, two copies of IC roller manufacturer software, and training.

3. Delays due to GPS satellite reception of signals to operate the IC equipment or IC roller breakdowns will not be considered justification for contract modifications or contract extensions.

Code	Pay Item	Pay Unit
24779EC	Intelligent Compaction for Soil	CY
24780EC	Intelligent Compaction for Aggregate	TON
24990EC	Intelligent Comp Subgrade Stabilization	SQYD

June 28, 2018

SPECIAL NOTE FOR PAVER MOUNTED TEMPERATURE PROFILES

This Special Note will apply when indicated on the plans or in the proposal. Section references herein are to the Department's Standard Specifications for Road and Bridge Construction current edition.

1.0 DESCRIPTION. Provide a paver mounted infrared temperature equipment to continually monitor the temperature of the asphalt mat immediately behind all paver(s) during the placement operations for all mainline pavements (including ramps for Interstates and Parkways) within the project limits. Provide thermal profiles that include material temperature and measurement locations.

2.0 MATERIALS AND EQUIPMENT. In addition to the equipment specified in Subsection 403.02 Utilize a thermal equipment supplier that can provide a qualified representative for on-site technical assistance during the initial setup, pre-construction verification, and data management and processing as needed during the Project to maintain equipment within specifications and requirements.

Provide operator settings, user manuals, required viewing/export software for analysis. Ensure the temperature equipment will meet the following:

(A) A device with one or more infrared sensors that is capable of measuring in at least 1 foot intervals across the paving width, with a minimum width of 12 feet, or extending to the recording limits of the equipment, whichever is greater. A Maximum of two (2) brackets are allowed in the influence area under the sensors. A temperature profile must be made on at least 1 foot intervals longitudinally down the road:

(B) Infrared sensor(s):

(1) Measuring from 32°F to 400°F with an accuracy of ± 2.0% of the sensor reading.

(C) Ability to measure the following:

(1) The placement distance using a Global Positioning System (GPS) or a Distance Measuring Instrument (DMI) and a Global Positioning System (GPS).

(2) Stationing

(D) GPS: Accuracy ± 4 feet in the X and Y Direction

(E) Latest version of software to collect, display, retain and analyze the mat temperature readings during placement. The software must have the ability to create and analyze:

(1) Full collected width of the thermal profiles,

(2) Paver speed and

(3) Paver stops and duration for the entire Project.

(F) Ability to export data automatically to a remote data server ("the cloud").

At the preconstruction meeting, provide the Department with rights to allow for web access to the data file location.

This web-based software must also provide the Department with the ability to download the raw files and software and to convert them into the correct format.

(G) The thermal profile data files must provide the following data in a neat easy to read table format.

(1) Project information including Road Name and Number, PCN, Beginning and Ending MPs.

(2) IR Bar Manufacturer and Model number

(3) Number of Temperature Sensors (N)

(4) Spacing between sensors and height of sensors above the asphalt mat

(5) Total number of individual records taken each day (DATA BLOCK)

(a) Date and Time reading taken

(b) Latitude and Longitude

(c) Distance paver has moved from last test location

(d) Direction and speed of the paver

(e) Surface temperature of each of the sensors

3.0 CONSTRUCTION. Provide the Engineer with all required documentation at the pre-construction conference.

(A) Install and operate equipment in accordance with the manufacturer's specifications.

(B) Verify that the temperature sensors are within ± 2.0% using an independent temperature device on a material of known temperature. Collect and compare the GPS coordinates from the equipment with an independent measuring device.

(1) Ensure the independent survey grade GPS measurement device is calibrated to the correct coordinate system (using a control point), prior to using these coordinates to validate the equipment GPS.

(2) The comparison is considered acceptable if the coordinates are within 4 feet of each other in the X and Y direction.

(C) Collect thermal profiles on all Driving Lanes during the paving operation and transfer the data to the "cloud" network or if automatic data transmission is not available, transfer the data to the Engineer at the end of daily paving.

(D) Contact the Department immediately when System Failure occurs. Daily Percent Coverage will be considered zero when the repairs are not completed within two (2) working days of System Failure. The start of this two (2) working day period begins the next working day after System Failure.

(E) Evaluate thermal profile segments, every 150 feet, and summarize the segregation of temperature results. Results are to be labeled as Minimal 0°-25°F, Moderate 25.1°-50°F and Severe >50°. Severe readings over 3 consecutive segments or over 4 or more segments in a day warrant investigation on the cause of the differential temperature distribution.

4.0 MEASUREMENT. The Department will measure the total area of the pavement lanes mapped by the infrared scanners. Full payment will be provided for all lanes with greater than 85% coverage. Partial payment will be made for all areas covered from 50% coverage to 85% coverage at the following rate Coverage area percentage X Total bid amount. And area with less than 50% coverage will not be measured for payment.

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

1. Payment is full compensation for all work associated with providing all required equipment, training, and documentation.
2. Delays due to GPS satellite reception of signals or equipment breakdowns will not be considered justification for contract modifications or contract extensions.

Code	Pay Item	Pay Unit
24891EC	PAVE MOUNT INFRARED TEMP EQUIPMENT	SQFT

SPECIAL NOTE

For Tree Removal

Boone County
Reconstruction and Widen KY-237
Item No. 06-8001.21

NO CLEARING OF TREES 5 INCHES OR GREATER (DIAMETER BREAST HEIGHT) FROM JUNE 1 THROUGH JULY 31.

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 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 36inches 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	AASHTO Nominal Diameter	Max. Deflection Limit	
		5.0%	10.0%
(inches)	(inches)	(inches)	
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:

% Deflection = [(AASHTO Nominal Diameter - D2) / AASHTO Nominal Diameter] x 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:

Code	Pay Item	Pay Unit
24814EC	Pipeline Inspection	Linear Foot
10065NS	Pipe Deflection Deduction	Dollars

Special Note for Bridge Demolition, Renovation and Asbestos Abatement

If the project includes any bridge demolition or renovation, the successful bidder is required to notify Kentucky Division for Air Quality (KDAQ) via filing of form (DEP 7036) a minimum of 10 days prior to commencement of any bridge demolition or renovation work.

Any available information regarding possible asbestos containing materials (ACM) on or within bridges to be affected by the project has been included in the bid documents. These are to be included with the Contractor's notification filed with the KDAQ. If not included in the bid documents, the Department will provide that information to the successful bidder for inclusion in the KDAQ notice as soon as possible. If there are no documents stating otherwise, the bidders should assume there are no asbestos containing materials that will in any way affect the work.

KENTUCKY TRANSPORTATION CABINET
DIVISION OF ENVIRONMENTAL ANALYSIS
PROJECT REEVALUATION

UST/HAZMAT IMPACTS

Reevaluation Phase: Construction		**Letting Date: 15-OCT-2017 – 6-8001.21**
Type Document: CE3		**Approval Date: 2-NOV-2006**
County: Boone	**Route: KY-237**	**Item No.: 6-8001; .21**
Limits: Reconstruct and Widen KY-237 from KY 18 to US 42 at Gunpowder Road		

REVIEW CATEGORY	*YES*	*NO*	*N/A*	*COMMENTS—EXPLAIN IF YES IS CHECKED*
PROJECT SCOPE CHANGES	X			(If yes, have revised plans been reviewed?) Bike lanes removed from the roadbed and relocated to 10 ft. multi-use paths along both sides of the road. 12 ft. travel lanes reduced to 11 ft. Middle turning lane reduced from 14 ft. to 13 ft. A grass strip will be provided behind back of curb to edge of the multi-use path. Overall width of the roadway typical section remains unchanged.
NEW LAWS/REGULATIONS		X		
PHASE I SITE ASSESSMENT COMPLETED	X			*UST Hazmat Phase I approved 6/13/03*
PHASE II REQUIRED		X		(If yes, list parcel no. or location) .
PHASE III (REMEDIATION) REQUIRED		X		(If yes, list parcel no., cost estimate & schedule for completion)
OTHER ISSUES		X		P59,233,235,238,239,246,247 & 257 will require an asbestos inspection prior to demolition.

CONDITIONS, MITIGATION, SPECIAL ISSUES: No UST/Hazmat impacts observed. All structures scheduled for demolition will require an asbestos inspection and a Ten day notification sent to the Division of Air Quality (Florence Regional Office) Prior to construction activities.

I have reviewed the project documentation and determined that no substantial changes have occurred in the project. Therefore, the findings of the original **UST/Hazmat** Assessment remain valid.

Brittany Stratton Brattan 4/28/15

UST/Hazmat Date

TRAFFIC CONTROL PLAN

TRAFFIC CONTROL GENERAL

Except as provided herein, traffic shall be maintained in accordance with the current editions of the Standard Specifications and Standard Drawings. Except for the roadway and traffic control bid items listed, all items of work necessary to maintain and control traffic will be paid at the lump sum bid price to "Maintain and Control Traffic".

Contrary to Section 106.01, traffic control devices used on this project may be new, or used in like new condition, at the beginning of the work and maintained in like new condition until completion of the work.

PROJECT PHASING & CONSTRUCTION PROCEDURES

At the discretion of the Engineer, days and hours may be specified when lane closures will not be allowed.

The Contractor may maintain alternating one way traffic during construction if the surface width is 16 feet or greater. The clear lane width shall be a minimum of 8 feet. If traffic should be stopped due to construction operations, and a school bus on an official run arrives on the scene, the Contractor shall make provisions for the passage of the bus as quickly as possible.

LANE CLOSURES

Lane closures shall not be left in place during non-working hours.

PAVEMENT EDGE DROP-OFFS

A pavement edge between opposing directions of traffic or lanes that traffic is expected to cross in a lane change situation shall not have an elevation difference greater than 1½". Warning signs (MUTCD W8-11 or W8-9A) shall be placed in advance of and at 1500 feet intervals throughout the drop-off area. Dual posting on both sides of the traveled way shall be required. All transverse transitions between resurfaced and unresurfaced areas which traffic may cross shall be wedged with asphalt mixture for leveling and wedging. The wedges shall be removed prior to placement of the final surface course.

Pavement edges that traffic is not expected to cross, except accidentally, shall be treated as follows:

- Less than 2" - No protection required.
- 2" to 4" - Place plastic drums, vertical panels, or barricades every 50 feet. Cones may be used in place of plastic drums, panels, and barricades during daylight working hours. Wedge with asphalt mixture for leveling and wedging with a 1:1 or flatter slope in daylight hours, or 3:1 or flatter slope during nighttime hours, when work is not active in the drop-off area.

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

TC 62-226
Rev. 01/2016
Page 1 of 1

RIGHT OF WAY CERTIFICATION

☒ Original	☐ Re-Certification	RIGHT OF WAY CERTIFICATION	
ITEM #	COUNTY	PROJECT # (STATE)	PROJECT # (FEDERAL)
6-8001.21	Boone	12FO FD52 008 6979203R	STP 8200(015)

PROJECT DESCRIPTION

Reconstruct and Widen KKY 237 from Valley View Drive to Rogers Lane

☐ **No Additional Right of Way Required**

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

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

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

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

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

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

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

Total Number of Parcels on Project	133	EXCEPTION (S) Parcel #	ANTICIPATED DATE OF POSSESSION WITH EXPLANATION
Number of Parcels That Have Been Acquired			
Signed Deed	130		
Condemnation	3	179, 261, 144	
Signed ROE	3	179, 261, 144	

Notes/ Comments (Use Additional Sheet if necessary)
P-179 ROE 9-1-17 Awaiting acceptance of bid P-261 Agreed IOJ entered 6-7-18 P-144 IOJ entered 3-21-17

LPA RW Project Manager		Right of Way Supervisor	
Printed Name		Printed Name	Brian R. Cox
Signature		Signature	
Date		Date	06-19-18
Right of Way Director		**FHWA**	
Printed Name		Printed Name	No Signature Required
Signature		Signature	as per FHWA-KYTC
Date	20 Jun 18	Date	Current Stewardship Agreement

UTILITIES AND RAIL CERTIFICATION NOTE

Boone County
00STP8200016
FD52 008 6979203U
Mile point: 2.251 TO 5.370
RECONSTRUCT AND WIDEN KY 237 FROM VALLEY VIEW DRIVE TO ROGERS LANE. (14CCR)
ITEM NUMBER: 06-8001.21

PROJECT NOTES ON UTILITIES

Damage to Utilities

Any intentional or accidental disruption of service due to damage to gas, sewer, or water mains caused by any of the contractor's operations without three days advance notice to the utility owner shall be cause for the Cabinet to charge liquidated damages in the amount of five thousand dollars per day ($5,000/day) per occurrence against the contractor until such a time as the utility main is restored.

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

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

Flowable Fill Requirement

The Contractor shall use flowable fill as the backfill media any place water lines cross under the existing or proposed roadway surfaces. It should also be noted that the cost of the flowable fill shall be incidental to the cost of the water line being installed.

External Utility Permits

Kentucky Division of Water permits for water relocation construction were not available before bidding. These items will be distributed at the preconstruction meeting.

Abandoned Utilities

The Contractor shall safeload the entire length of all abandoned pipes 6 inches in diameter and larger under proposed pavement and under any existing pavement that is to remain. The Contractor shall safeload the entire length of all abandoned pipes 15 inches and larger which will be located outside of proposed pavement but within project limits. Appropriate bid items have been included in the road contract. The safeloading criteria above shall be observed unless otherwise directed by the Section Engineer or his representative.

UTILITIES AND RAIL CERTIFICATION NOTE

Boone County
00STP8200016
FD52 008 6979203U
Mile point: 2.251 TO 5.370
RECONSTRUCT AND WIDEN KY 237 FROM VALLEY VIEW DRIVE TO ROGERS LANE. (14CCR)
ITEM NUMBER: 06-8001.21

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

The Contractor will be responsible for contacting all utility facility owners on the subject project to coordinate activities. The Contractor will coordinate activities to minimize and, where possible, avoid conflicts with utility facilities. 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.

The Contractor shall make every effort to protect underground facilities from damage as prescribed in the Underground Facility Damage Protection Act of 1994, Kentucky Revised Statute KRS 367.4901 to 367.4917. It is the Contractor's responsibility to determine and take steps necessary to be in compliance with federal and state damage prevention directives. The Contractor is instructed to contact KY 811 for the location of existing underground utilities. Contact shall be made a minimum of two (2) and no more than ten (10) business days prior to excavation. The Contractor shall submit Excavation Locate Requests to the Kentucky Contact Center (KY 811) via web ticket entry. The submission of this request does not relieve the contractor from the responsibility of contacting non-member facility owners, whom are to be contacted through their individual Protection Notification Center. It may be necessary for the contractor to contact the County Court Clerk to determine what utility companies have facilities in the area. Non-compliance with these directives can result in the enforcement of penalties.

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

Mid-Valley Pipeline crude oil transmission facilities shall not be disturbed by the Contractor as part of this project. This facility crosses the project at Station 213+10.08. The Contractor should proceed with caution in the vicinity of this facility. Test excavations to date indicate a minimum existing cover of 3.17 feet. After construction, minimum proposed cover should be 3.52 feet. Existing depths of the pipeline vary and should be verified by the Contractor prior to construction. Investigation to date has not indicated relocation of the pipeline is required.

UTILITIES AND RAIL CERTIFICATION NOTE

Boone County
00STP8200016
FD52 008 6979203U
Mile point: 2.251 TO 5.370
RECONSTRUCT AND WIDEN KY 237 FROM VALLEY VIEW DRIVE TO ROGERS LANE. (14CCR)
ITEM NUMBER: 06-8001.21

Mid-Valley Pipeline will require timber mat cover/loading protection at a minimum but preference is an "air bridge" to protect pipeline crossing location. Refer to the bid documents for maximum allowable loading stresses on the pipeline. It is the responsibility of the Contractor to coordinate with Mid-Valley Pipeline inspectors while working in the vicinity of the pipeline crossing.

Boone-Florence Water Commission has a 16" water distribution facility that crosses the project near Station 86+70. This is only the Boone-Florence Water Commission facility within project limits and shall not be disturbed by the Contractor.

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

THE FOLLOWING FACILITY OWNERS ARE RELOCATING/ADJUSTING THEIR FACILITIES WITHIN THE PROJECT LIMITS AND WILL BE COMPLETE PRIOR TO CONSTRUCTION

Duke Energy (Gas) distribution facilities should be relocated prior to roadway construction. Duke began this relocation work on May 14, 2018. The company began work at the Oakbrook Dr./Carters Mill Ln. intersection and then proceeded to the Gunpowder Creek crossing in order to avoid all potential roadway construction conflicts. Work then began at the start of the roadway project and is progressing towards the end of the roadway project. This work is expected to be complete prior to the start of roadway construction.

There is an existing 12-inch high pressure transmission facility that crosses the project between Stations 188+00 – 195+00. This facility will not be relocated prior to construction. The Contractor will need to coordinate with Duke Energy on the relocation schedule of this facility in order to avoid conflicts.

Duke Energy's proposed gas main locations are marked in the plan set in the Utility Reference Sheets (Sheets R197 – R215), as provided as part of the bid documents. Locations in the Utility Reference Sheets are approximate and final as-built gas mains shall be verified with Duke Energy by the Contractor.

THE FOLLOWING FACILITY OWNERS HAVE FACILITIES TO BE RELOCATED/ADJUSTED BY THE OWNER OR THEIR SUBCONTRACTOR AND IS TO BE COORDINATED WITH THE ROAD CONTRACT

Owen Electric Cooperative, Cincinnati Bell Telephone, Charter Communications, and **Duke Energy (Gas)** have overhead and/or underground facilities that will be relocated by the utility owners concurrently with the road construction. **These companies estimate relocation of their facilities will be complete by August 31, 2019. This date is an estimation. The successful contractor should be aware that relocations by these**

UTILITIES AND RAIL CERTIFICATION NOTE

Boone County
00STP8200016
FD52 008 6979203U
Mile point: 2.251 TO 5.370
RECONSTRUCT AND WIDEN KY 237 FROM VALLEY VIEW DRIVE TO ROGERS LANE. (14CCR)
ITEM NUMBER: 06-8001.21

companies may not be complete by this date. The road contractor will be required to coordinate with these utility companies and their contractors until completion of their work.

While the aforementioned Duke Energy (Gas) distribution project is expected to be complete prior to roadway construction, there will be a pressure improvement project which will provide a connection for two separate distribution networks. This connection will be installed between roadway STA. 219+00 and 231+00. This project is expected to begin 9/1/18 and expected completion date is 10/31/18. Duke can be flexible in this timeline and is willing to work within the timeline agreed upon by the roadway contractor.

Additionally, a Duke Energy (Gas) high-pressure transmission line exists between Stations 188+00 – 195+00 which is to be relocated concurrently with road construction. The road contractor shall coordinate schedules with Duke Energy (Gas) in order to avoid conflicts with this relocation. Duke Energy (Gas) requires the existing earth between the above stations to remain undisturbed until the completion of the new gas transmission facilities.

It will be the responsibility of the Contractor to remove any abandoned portions of the existing gas transmission line in conflict with the construction of the roadway project. Any pipe removed will become property of the road contractor. Duke Energy (gas) tested the pipe for hazardous materials and none were detected.

The Cabinet will consider submission of a bid as the Contractor's agreement to not make any claims for additional monetary compensation due to delays or other conditions created by the operations of Owen Electric Cooperative, Cincinnati Bell Telephone, Charter Communications, and Duke Energy (Gas). Monetary claims will not be considered for any delays incurred before or after August 31, 2019. Any costs (including delay costs) related to the coordination and cooperation with these utility companies shall be included in the bid item for "General Utility Coordination". After August 31, 2019, when the Contractor cannot perform work on the controlling operation due to conflicting work, or incomplete infrastructure relocations, being performed by Owen Electric Cooperative, Cincinnati Bell Telephone, Charter Communications, or Duke Energy (Gas) calendar days will be added to the fixed completion date on a day for day basis. No days will be added for delays prior to August 31, 2019. Should a difference of opinion arise as to the rights of the Contractor and others working within the limits of – or adjacent to – the project, the KYTC Section Engineer will decide as to the respective rights of the various parties involved in order to assure the completion of the Cabinet's work in general harmony and in a satisfactory manner, and his decision shall be final and binding upon the Contractor.

UTILITIES AND RAIL CERTIFICATION NOTE

Boone County
00STP8200016
FD52 008 6979203U
Mile point: 2.251 TO 5.370
RECONSTRUCT AND WIDEN KY 237 FROM VALLEY VIEW DRIVE TO ROGERS LANE. (14CCR)
ITEM NUMBER: 06-8001.21

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

City of Florence Water, **Boone County Water District**, and **Sanitation District No. 1** have facilities to be adjusted by the roadway contractor using plans inserted into the road construction plans and specifications inserted into the project proposal. Appropriate utility bid items have been included in the contract bid documents.

Utility Phasing:

The Contractor should be aware that some utilities will need to be relocated to accommodate the relocation of other utilities or construction of the roadway. Portions of utility relocations may need to be conducted outside of the MOT plan to allow the project to move forward. The Contractor should review the plans and draw his own conclusions as to the phasing of the various utilities. Utility work that needs to be conducted outside of the MOT phasing should be coordinated with the section engineer. The Contractor should pay close attention to the proximity of construction of new facilities when working in the vicinity of existing water mains to prevent blow-outs.

Notes:

- Utility pipeline fittings are not bid as separate pay items in new utility main installations in this contract. Fittings are considered incidental to pipe and other items.
- Utility service laterals included in this contract are not paid on a linear basis. Service laterals are bid in lump sum as short side and long side.
- Bidding contractors should note that several other items of pay have been modified from previous road contracts. The contractor should thoroughly review the Standard Bid Item Descriptions for each utility discipline included in the contract. These bid item descriptions are included elsewhere in the project proposal.

Impacts to Sanitation District No. 1 facilities are minimal. There are seven manhole rim adjustments and one new manhole installation. There is not a separate set of SD1 plans provided. All SD1 bid items are included in the roadway plan set. Notes have also been added to the roadway plan set identifying adjustment locations.

RAIL COMPANIES HAVE FACILITIES IN CONJUNCTION WITH THIS PROJECT AS NOTED

☒**No Rail Involvement** ☐**Rail Involved** ☐**Rail Adjacent**

Form Revised 6/24/16

UTILITIES AND RAIL CERTIFICATION NOTE

Boone County
00STP8200016
FD52 008 6979203U
Mile point: 2.251 TO 5.370
RECONSTRUCT AND WIDEN KY 237 FROM VALLEY VIEW DRIVE TO ROGERS LANE. (14CCR)
ITEM NUMBER: 06-8001.21

AREA FACILITY OWNER CONTACT LIST

Facility Owner	Address	Contact Name	Phone	Email

UTILIY FACILITY OWNER CONTACT INFORMATION TO BE PROVIDED AT PRECONSTRUCTION MEETING

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

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

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

PROTECTION OF EXISTING UTILITIES

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

PREQUALIFIED UTILITY CONTRACTORS

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

> *"**No contractors are required to be prequalified or preapproved by the utility owners to perform utility relocation work under this contract.**"*

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

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

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

CONTRACT ADMINISTRATION RELATIVE TO UTILITY WORK

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

SUBMITTALS AND CORRESPONDENCE

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

ENGINEER

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

INSPECTOR OR RESIDENT PROJECT REPRESENTATIVE

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

NOTICE TO UTILITY OWNERS OF THE START OF WORK

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

UTILITY SHUTDOWNS

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

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

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

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

or corporation stop and/or capping or plugging the tap, digging down on a sewer tap at the main and plugging or capping the tap, digging down on a service line or lateral at a location shown on the plans or agreeable to the engineer and capping or plugging, or performing any other work necessary to abandon the service or lateral to satisfactorily accomplish the final utility relocation.

STATIONS AND DISTANCES

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

RESTORATION

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

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

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

MATERIAL

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

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

> *"**No materials are being supplied by the utility owners. All materials are to be supplied by the contractor per bid item descriptions, utility specifications and utility plans.**"*

SECURITY OF SUPPLIED MATERIALS

If any utility materials are to be supplied by the utility owner, it will be the responsibility of the utility contractor to secure all utility owner supplied materials after delivery to the project site. The utility

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

SPECIAL UTILITY BID ITEMS

SPECIAL UTLIITY BID ITEM DESCRIPTION

GENERAL UTILITY COORDINATION

Payment under this item is for coordination required and/or delays incurred due to concurrent utility work on the project. This shall include delays incurred due to utility relocations and unforeseen utility repairs not included in the contract plan set and proposal. The contractor will have to coordinate and work in conjunction with any utility owner, no matter if the road contractor is physically relocating features for that utility owner or not. In addition, it may be necessary to phase work to avoid active utilities that ultimately become inactive. Relocation of those utilities that will ultimately become inactive may either be part of the contract, or the relocation may need to be performed by the utility owner. Other than the amount bid under this item, KYTC will not provide any additional monetary compensation for the delays caused during the relocation of any utility.

After August 31, 2019, when the contractor cannot perform work on the controlling operation due to conflicting work or incomplete infrastructure relocations, being performed by Owen Electric Cooperative, Cincinnati Bell Telephone, Charter Communications or Duke Energy (Gas) calendar days will be added to the fixed completion date on a day for day basis. No days will be added for delays prior to August 31, 2019.

Any changes to the proposed scope and/or schedule of any utility work shall be approved by KYTC.

WATER MAIN SPECIFICATIONS

- Owners: Boone County Water District
  2475 Burlington Pike
  Burlington, Kentucky 41005-0018
  Ph. (859) 586-7270

- Description: Water Main Relocation

- Location: Boone County
  KY. 237 Pleasant Valley Rd/
  Camp Ernst Rd from
  Valley View Dr. to Rogers Ln.
  Kentucky Transportation Cabinet
  Road Widening Project
  FD04 008 0237 002-006
  Item No. 06-8001.21

- Date: April 30, 2018
- Update: June 13, 2018

Water Specifications

Section I

GENERAL INSTRUCTIONS AND SPECIAL NOTES

1. **WATER SHUTDOWNS**: No customer of Boone County Water District shall be without water for a period longer than 4 hours unless approved by Boone County Water District. All customers to be without water shall be notified 24 hours in advance. No active water main shall be shut down without prior approval of Boone County Water District. Tie-ins on this project may have to be scheduled at night, on weekends or other off peak hours.

2. **FIRE HYDRANT DISCONNECTION**: No fire hydrant shall be removed from service without prior approval of Boone County Water District, and the proper fire authority.

3. **WATER MAIN INSPECTION**: Boone County Water District and their inspectors, and the resident engineer and his inspectors shall be jointly responsible for inspection of water line facilities installation. Where the phrase "as directed" appears in these specifications without defining who is doing the directing, it shall be understood "as directed" means jointly directed by the Resident Engineer and Boone County Water District.

4. **PRIOR INSPECTION OF EXISTING METER SETTINGS**: The Contractor with the Boone County Water District's inspector shall make an inspection of all meter settings to adjusted or relocated prior to construction. Any meter setting not up to Boone County Water District standard shall be noted and parts furnished to the Contractor by the Boone County Water District for installation as needed. Any water meter setting, fire hydrant or any other water facilities that are to be relocated, adjusted, reused or remain and are damaged by the Contractor shall be repaired at the contractor's expense. Any old water meter settings removed and not reused shall be turned over to the Boone County Water District.

5. **SPECIAL BACKFILL NOTE**: No sand or granular material shall be used for backfill above 300 mm (12") over the top of the pipe or around structures. Only compacted soil or flowable fill shall be used unless approved or otherwise directed by the Resident Engineer.

6. **GENERAL SAFETY**: For the security and safety of people in and adjacent to trenches or construction operations, the "Manual of Accident Prevention in Construction" published by the Associated General Contractors Association of America, the "Manual On Uniform Traffic Control Devices" published by the Federal Highway Administration, and the safety regulations of the appropriate state and local agencies shall be followed when specifically applicable, or by similarity of operation or as necessary for adequate protection.

7. **MATERIAL HANDLING**: Pipe, fittings, valves, hydrants, and accessories shall be loaded, unloaded, and handled by lifting with hoists or skidding so as to avoid

shock or damage. Under no circumstances shall such materials be dropped. Pipe handled on skidways shall not be skidded or rolled against other pipe.

8. **PROTECTION OF PAVEMENT**: Where main construction is located in or adjacent to pavements, all construction equipment shall have rubber tires. Crawler equipment will be permitted when there is no danger of damaging pavement.

9. **NOISE, DUST AND ODOR CONTROL**: The Contractors construction activities shall be conducted so as to eliminate all unnecessary noise, dust, and odors. The use of oil or other materials, for dust control, which may cause tracking, will not be permitted.

10. **EXCAVATION AND CONSTRUCTION MATERIALS:** All excavated material and all construction materials in prosecution of the work shall be deposited so as not to endanger the work, create unnecessary annoyance to the public, or interfere with natural drainage courses. During the course of the work, all material piles shall be kept trimmed up and maintained in a neat, workmanlike manner. All material piles shall be kept a reasonable distance away from roadways so as not to cause a hazard and block the motorist's view.

11. **PROTECTION OF TREES, SHRUBS, AND OTHER ITEMS TO REMAIN:** Special care shall be taken by the Contractor to avoid unnecessary damage to trees or shrubs and their root systems or any other items shown to remain. Should the Contractor do unnecessary damage to any item shown to remain, the item shall be repaired or replaced at the contractor's expense. Should unnecessary damage be caused to items to remain and is determined not repairable, the Contractor shall compensate the owner for the loss if any.

12. **UNACCEPTABLE EXCAVATED TRENCH MATERIAL**: Any excavated trench material which is determined unacceptable for backfill shall be removed from the area and wasted at a location acquired by the Contractor and approved by the Resident Engineer. Acceptable backfill material shall be acquired by the Contractor at a location approved by the Resident Engineer. The disposition and handling of unacceptable material and the acquisition and handling of acceptable material shall be at the Contractors expense.

13. **BLASTING ROCK**: No blasting of rock shall be performed without specific permission of the Resident Engineer. Blasts shall be properly covered and all utilities and structures in the area shall be properly protected. Warning shall be given to all persons in the area who could be affected by the blasting. Blasting shall be at the risk of the Contractor who shall be liable for all damages to persons or property caused by the blasting. All blasting shall be performed in accordance with all regulations of the Kentucky Department of Mines and Minerals and all other governing agencies having jurisdiction. The Kentucky Department of Mines and Minerals, area emergency response agencies, utility companies with utilities in the area shall be notified of the blasting sufficiently in advance.

14. **ABANDONED VALVES**: The valve boxes shall be removed from all abandoned valves prior to final roadway paving. This shall be done to the satisfaction of the Engineer. Paving over a valve box without removing same will not be acceptable.

No separate payment will be made for removal of valve boxes but shall be considered incidental to water line construction.

15. **CONSTRUCTION PROCEDURE**: The successful contractor to prepare construction procedure with respect to the installation of water utilities. The Sequence and Procedure of Water Utilities Construction shall be approved by the Boone County Water District's Engineering Department and KYTC Section Engineer prior to the beginning of the water utilities relocations.

Section II

MATERIAL SPECIFICATIONS

1. **CONCRETE**: All concrete shall be Class A in accordance with KYDOH Standard Specs. for Road and Bridge Construction current edition and shall be placed in accordance with same unless otherwise noted. The concrete shall be placed to the dimensions as required in the plans or specifications. Reinforcing steel shall be placed in the concrete as required in the plans or specifications.

2. **CONCRETE REINFORCING STEEL:** All reinforcing steel shall be Grade 40. The size, location, placement, and quantity shall be as required in the plans or specifications.

3. **WATER MAIN**

A-1. **DUCTILE IRON PIPE**: Ductile iron pipe shall meet the requirements of ANSI A21.51 (AWWA C151)

1. **Material:** The chemical constituents shall meet the physical property recommendations of ASTM A536 to ensure that the iron is suitable for satisfactory drilling and cutting.

2. **Minimum Thickness**: Unless otherwise shown on the plans, the minimum thickness of the barrel of the pipe shall be Class 50. All pipe shall be clearly marked as to class by the manufacturer.

3. **Coating and Lining**: The pipe shall be coated outside with a bituminous coating in accordance with ANSI A 21.51 (AWWA C151) and lined inside with cement mortar and seal coated in accordance with ANSI A21.4 (AWWA- C104).

4. **Fittings & Glands**: Fittings and glands shall be ductile iron as specified in Section 3A, "Ductile Iron Fittings".

5. **Polyethylene Encasement**: Ductile Iron Pipe shall be encased with Polyethylene film conforming to ANSI A21.5 (AWWA C105)

A-2. **POLYVINYL CHLORIDE PIPE** – Polyvinyl Chloride Pipe shall meet the requirements of ANSI/AWWA C900-81, "Polyvinyl Chloride (PVC) Pressure Pipe (DR 14), 4 in. through 12 in., for water."

Three inch Blue Magnetically Detectable Tape is required in the trench above water main as specified on detail.

B. **PIPE JOINTS**

1. **Push on and Mechanical**: Push-on and mechanical joints including accessories shall conform to ANSI A21.11 (AWWA-C111). Bolts shall be high strength COR-10 tee head with hex nuts. The maximum deflection at push-on joints and/or mechanical joints shall be 5 degrees or as recommended by the Manufacturer.

2. **Flanged**: Flanged joints shall meet the requirements of ANSI A21.15 (AWWA C115) or ANSI B16.1

   a. **Gaskets**: All flanged joints shall be furnished with 1/16 inch thick full face red rubber.

   b. **Bolts:** Bolts shall have American Standard heavy unfinished hexagonal head and nut dimensions all a specified in ANSI B18.2. For bolts of 1-3/4 inches in diameter and larger, bolt studs with a nut on each end are recommended. Material for bolts and nuts shall conform to ASTM A307, Grade B.

3. **Restrained:** If restrained joint system is required on the plans, all pipes, bends, valves, etc. shall be restrained. Restrained joints shall consist of a device to provide a flexible, tied joint. Acceptable devices would be a clamp type joint or bell-bolt flexible tied joint or approved equal. Method of restraining and laying schedule shall be approved by the Engineer prior to the start of the project. Manufacturer installation instructions shall be followed. Restrained joints shall be capable of withstanding a maximum joint pressure of 14 kg/sq.cm (200 psi.) unless otherwise noted.

   a. **Bell and Spigot**: Bell and spigot joints shall conform to ANSI A21.6.

   b. **Push-on:** Restrained push-on joints shall conform to ANSI A21.11 (AWWA C111). When bolts and nuts are required, they shall be corrosion resistant high strength steel. **Mechanical joints with retainer gland and Lok-Set joints are not acceptable unless otherwise specified.**

4. **FITTINGS**

A. **DUCTILE IRON FITTINGS**: Ductile Iron Compact Fittings and accessories shall conform to AWWA C153 and Full Body Fittings - and accessories to AWWA C110. Bolts and nuts shall be high strength, corrosion resistant alloy, such as "Cor-Ten" or approved equal.

1. **Working Pressures:** All fittings and accessories shall be Ductile Iron, rated for a minimum of 14 kg/sq.cm (200 psi) working pressure or as specified herein. The fittings and accessories shall be new and unused. (NOTE: Certain areas of the District's service area require materials used, to be of a higher working pressure than 14 kg/sq.cm (200 psi.))

2. **Coating and Lining**: The fittings shall be coated outside with a bituminous coating in accordance with ANSI A21.10 (AWWA C110) and lined inside with cement mortar and seal coated in accordance with ANSI A21.4 (AWWA C104).

3. **Fittings and Glands:** All pipe fittings shall be mechanical joint fittings. Mechanical joints shall conform to AWWA C111.

4. **Polyethylene Encasement**: Ductile Iron Fittings shall be encased with polyethylene film conforming to ANSI A21.5 (AWWA C105)

B. **JOINTS**

1. **Mechanical**: Mechanical joints including accessories shall conform to ANSI A21.11 (AWWA C111). Glands shall be ductile iron. Bolts shall be high strength COR-10 tee head with hex nuts.

2. **Flanged**: Flanged joints shall meet the requirements of ANSI A21.15 (AWWA C115) OR ANSI B16.1 and be used with the express approval of the Engineer.

   a. **Gaskets**: All flanged joints shall be furnished with 1/16 inch thick full face red rubber.

   b. **Bolts:** Bolts shall be stainless steel and have American Standard heavy unfinished hexagonal head and nut dimensions all a specified in ANSI B18.2. For bolts of 1-3/4 inches in diameter and larger, bolt studs with a nut on each end are recommended. Material for bolts and nuts shall conform to ASTM A307, Grade B.

3. **Restrained:** If restrained joints is shown on the plans, all pipe, bends, valves, etc. shall be restrained.

   a. **Bell and Spigot:** Bell and spigot joints shall conform to ANSI A21.6.

5. **POLYETHYLENE WRAP**

All ductile iron pipe, fittings, valves, and fire hydrant leads shall be polyethylene wrapped, installed according to the current edition of AWWA C105. Ductile iron fittings, valves, and fire hydrant leads used in the installation of P.V.C. pipe shall be included.

A. **MATERIAL**: Polyethylene wrap shall be a minimum of a 8-mil polyethylene tube.

B. **INSTALLATION**: The contractor shall cut the roll in tubes 600 mm (2 feet) longer than a standard length of pipe. Each tube shall be slipped over the length of pipe, centering to allow a 300 mm (1') overlap on each adjacent pipe section. After the lap is made, slack in the tubing shall be taken up for a snug fit and the overlay shall be secured with polyethylene tape.

Pipe shall not be wrapped and stored on site for any period of time, but wrapped and immediately placed in the trench, fittings shall be wrapped prior to installing blocking or pads. (see Standard Drawing #104) Polyvinyl chloride pipe requires no wrap. Odd shaped appurtenances such as valves, tees, fittings, and other ferrous metal pipeline appurtenances shall be wrapped by using a flat sheet of polyethylene. Wrapping shall be done by placing the sheet under the appliances and bringing the edges together, folding twice, and taping down.

6. **FIRE HYDRANTS**

A. **DESCRIPTION**: The Contractor shall provide all labor, materials, tools, and equipment required to furnish and install in good workmanlike manner all fire hydrants complete and ready for service where shown on the plans or where directed by the Engineer and as specified herein.

B. **FIRE HYDRANTS**: Fire hydrants shall conform to AWWA C502. Hydrants shall conform to the standards of the Boone County Water District as SHOWN on the plans. All fire hydrants shall have auxiliary valves for isolating water flow to the hydrant. All fire hydrants and auxiliary valves shall be positively locked to the water main by restrained joints, hydrant adapters, or other approved method.

Hydrants shall be designed to 14 kg/sq.cm (200 psi) working pressure and shall be shop tested to 21 kg/sq.cm (300 psi) hydrostatic pressure with the main valve both open and closed. The barrel shall have a breakable safety section and/or base bolts just above the ground line. Hydrants shall have a main valve opening of 5 1/4 inches, a 6 inch mechanical joint inlet to be suitable for setting in a trench 1,000 mm (3' 6") deep minimum, and shall be the traffic style hydrant so that the main valve remains closed when the barrel is broken off. Hydrants shall have a dry top and shall be self draining, when the main valve is closed. Self draining hydrants shall drain to dry wells provided exclusively for that purpose. Hydrant drains shall not be connected to storm or sanitary sewers. Hydrants located in areas determined by the Engineer (flood zones) shall have all drain holes

plugged prior to installation. Hydrants shall be rotatable in a minimum of eight (8) positions in 360 degrees. All hydrants shall have two (2)- two and one half (2 1/2) inch hose nozzles and one (1) steamer or pumper connection threaded to conform to Boone County Water District Standards: steamer nozzle shall be National Standard Thread and 2 1/2" outlets shall be Boone County Water District Standard Thread (Old Cincinnati Thread). The operating nut and the nuts of the nozzle caps shall be square in shape, measuring one (1) inch from side to side. Hydrant body shall be painted yellow for areas designed for 10.5 kg/sq.cm (150 psi) working pressure and red for areas in excess of 10.5 kg/sq.cm (150 psi). Hydrants used in areas in excess of 10.5 kg/sq.cm (150 psi) working pressure shall be designed to operate at the higher pressures and shall have independent operating valves on each 2 1/2" outlet.

All hydrants shall be right hand open, clockwise as specified in Standard Drawings and shall have a direction arrow of operation cast into the dome of the hydrant. Installation per Standard Drawing.

C. **INSTALLATION**: The installation of fire hydrants shall be in conformance with "Mains Installation" section, paragraph "Setting Hydrants".

D. **POLYETHYLENE ENCASEMENT:** Fire hydrant tee, anchoring pipe and part of the fire hydrant shoe shall be encased with Polyethylene film conforming to ANSI A21.5 (AWWA C105). . (See Standard Drawing)

7. **VALVES**

A. **DESCRIPTION**: The Contractor shall provide all labor, materials, tools, and equipment required to furnish and install in good workmanlike manner all valves and accessories complete and ready for service where shown on the plans or where directed by the Engineer and as specified herein.

B. **GATE VALVES**: Gate valves shall conform to AWWA C509 and shall be cast iron or ductile body, resilient wedge, non-rising stem with rubber "O" ring packing seals. The valves shall open by turning counter-clockwise. All valves shall have openings through the body of the same circular area as that of the pipe to which they are attached. Valves shall have mechanical joint ends unless otherwise shown on the plans or directed by the Engineer. All valves shall be designed for a working pressure of 17.5 kg/sq.cm (250 psi) unless otherwise noted on the plans or in the "Supplemental Specifications". An extension stem shall be furnished if required, to bring the operating nut within 1,000 mm (3-1/2 feet) of finished grade. Extension stems shall be securely fastened to the valve stem. The Contractor shall make all valves tight under their working pressures after they have been placed and before the main is placed in operation.

C. **BUTTERFLY VALVES**: Unless otherwise specified valves 400 mm (16 inches) and larger shall be butterfly valves rated at 17.5 kg/sq.cm (250 psi) working pressure and conform to the applicable portions of AWWA Standard C504, latest edition. Engineer shall approve all butterfly valves before installation. The contractor shall be required to transport all butterfly

valves to the District's Warehouse for testing and pick them up after testing is completed. Valve testing will be completed at a rate of one valve per day under normal conditions, with prior notice given to the District.

1. **Body**: The valves shall be AWWA Class 250B designed for tight shut-off against a differential pressure of 17.5 kg/sq.cm (250 psi). Valve bodies shall be constructed of ductile iron. Two trunnions for shaft bearing shall be integral with the valve body. The valves and appurtenances shall be suitable for buried service.

2. **Ends:** Valves shall have mechanical joint ends and shall be furnished with high strength COR-10 tee head with hex nuts, ductile iron glands, and rubber gaskets for each mechanical joint end.

    a. **Prestressed Concrete Pipe:** Valves for use with prestressed concrete pipe shall be furnished with victualic ends for victualic coupling Style 44, unless otherwise shown on the plans. The use of mechanical joint type valves with the proper adapter pieces on both sides of the valves are acceptable in lieu of the victualic style valve with prestressed concrete pipe.

3. **Discs:** Valve discs of cast steel, fabricated steel, or cast bronze are not acceptable.

4. **Seats**: Seats bonded on the discs are not acceptable.

5. **Shaft Seals**: If stuffing boxes are utilized for shaft seals they shall be constructed of cast iron, ASTM A126. Gland assemblies shall be of cast bronze, ASTM B132. The packing gland shall be housed in a solid walled cast iron, ASTM A48, Class 40 one piece structure or equal.

6. **Operators:** The valve operating mechanism shall be for counterclockwise opening. There shall be no external moving parts on valve or operator except the operator input shaft. Input shaft is to be operated by a 50 mm (2") square operating nut. Maximum required input force on the operator shaft to open and close the valve shall be 40 pounds. The total number of turns applied to the operating nut required to completely open the valve from a completely closed position shall not be less than twice the normal valve diameter. An extension stem shall be furnished to bring the operating nut within 1,000 mm (3 1/2 feet) of the finished grade. Extension stems shall be securely fastened to the valve stem.

D. **TAPPING SLEEVES AND VALVES**: Tapping sleeves and valves shall be designed for a working pressure of 17.5 kg/sq.cm (250 psi). The tapping sleeve together with the tapping valve shall be tested at 17.5 kg/sq.cm (250 psi) for visible leakage and pressure drop before the main is tapped. Tapping sleeve and valve used in high pressure areas shall be tested at 24.5 kg/sq.cm (350 psi).

1. **Tapping Sleeves:** Tapping sleeves shall be two piece with mechanical joint type ends, and be so designed as to assure uniform gasket pressure and permit centering of the sleeve on the pipe.

2. **Tapping Valves**: Tapping valves shall have a flange on one end for bolting to the tapping sleeve and a mechanical joint type end connection on the outlet with slotted standard flange or other adapters for connection to the tapping machine. The valves shall open by turning counterclockwise. Tapping valves shall conform to AWWA C509.

E. **VALVE BOXES**: All valves shall be provided with valve boxes. Valve boxes shall be of standard, adjustable, heavy duty cast iron extension type, two piece, 5 1/4 inch shaft, screw type, and of such length as necessary to extend from valve to finished grade, Tyler #562-S, Tyler #564-S or approved equal. Valve box cover shall be stamped "Water". Tops shall be set at final established grade.

F. **AIR RELEASE AND VACUUM VALVES**: Air release valves shall be constructed at high points in the water line as indicated on the plans. These valves shall permit the air in the pipeline to escape as the pipe line fills and allows the air to re-enter as the line empties. These valves shall be APCO Air Release Valves Model #200-A, 17.5 kg/sq.cm (250 psi) working pressure, 25 mm (1”), cast iron body and cover. 400 mm (16") and larger water mains shall be a 50 mm (2") air release valve and curb stop. Refer to Standard Drawing for reference.

8. **STEEL CASING PIPE**

Casing pipe shall be steel pipe with a minimum yield strength of 2450 kg/sq.cm (35,000 psi) with a minimum wall thickness as listed below:

Nominal Diameter Casing Pipe	Normal Wall Thickness
Under 350 mm (14")	0.251"
350 & 400 mm(14"&16")	0.282"
450 mm (18")	0.313"
500 mm (20")	0.344"
550 mm (22")	0.375"
600 mm (24")	0.407"
650 mm (26")	0.438"
700 & 750 mm(28"&30")	0.469"
800 mm (32")	0.501"
850 & 900 mm(34"&36")	0.532"
950 – 1050mm(38,40&42")	0.563"
1200 mm (48")	0.626"

The inside diameter of the casing pipe shall be at least 100 mm (4”) greater than the outside diameter of the carrier pipe joints. Steel casing sections shall be connected by welding, conforming to AWWA C206.

Adequate pipe spacers shall be installed to ensure that the carrier pipe is adequately supported in the center of the casing pipe throughout it's length, particularly at the ends. There shall not be any metallic contact between the casing and carrier pipe. Casing shall be backfilled with pea gravel or sand after the carrier pipe is installed to prevent pipe movement. Casings shall have both ends sealed up in such a way as to prevent the entrance of foreign material. See Standard Drawing for installation details.

9. **MATERIAL APPROVAL:** Material certification and test samples shall be provided by the Contractor, at the contractor's expense, as required by Boone County Water District and the Kentucky Department of Highways. No material shall be used until approved. All rejected material be removed from the project and approved material acquired by the Contractor at the Contractor's expense.

10. **PAVING MATERIALS FOR REPLACEMENT IN-KIND:** All materials for replacement in-kind of streets, sidewalks, curbs, walls etc. shall meet the requirements of the applicable sections of KYDOH Standard Specifications For Road And Bridge Construction.

11. **FLOWABLE FILL:** This material shall meet the requirements Section 601.03.03 of the Kentucky Department of Highways' Standard Specifications for Road and Bridge Construction.

Section III

CONSTRUCTION

A. **GENERAL**: Installation of water mains and appurtenances shall conform to the latest edition of AWWA Standard C600 for D.I.P.

Water main pipe and fittings shall be laid on a good level foundation with no gaps or humps under the pipe or fittings. Excavation shall be done by hand at joints to prevent the pipe and fittings from being supported by the mechanical joint or slip joint bell. Pipe shall be laid with the bell ends facing in the direction of laying.

The interior of the pipe shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations. ALL OPEN ENDS ARE TO BE CLOSED WITH CAPS OR PLUGS AT ALL TIMES WHEN PIPE LAYING OPERATIONS ARE NOT IN OPERATION AND AT THE END OF THE DAY. All caps or plugs shall be properly installed and blocked in advance of filling, flushing, and testing mains. All securing and blocking shall be inspected by the Engineer prior to backfilling of ditch.

B. **HANDLING**: Pipe, fittings, valves, hydrants and accessories shall be loaded and unloaded by lifting with hoists or skidding so as to avoid damage. Under no circumstances shall such materials be dropped. Pipe handled on skidways shall not be skidded or rolled against other pipe. Pipe hooks that extend inside the ends of the pipe shall not be used for handling the pipe since they could damage the lining. Under no circumstances shall such materials be dropped. The interior of all

pipes, fittings and other accessories shall be kept free from dirt and foreign material at all times. When handling P.V.C. pipe, care should be taken to avoid abrasion damage, gouging of the pipe, rocks, and any stressing of the bell joints or damage of the bevel ends.

C. **TREE REMOVAL**: Stumps of trees designated for removal 25 mm (12") in diameter and smaller shall be physically removed. Any stump larger than 25 mm (12") shall be ground down to 15 mm (6") below final grade level.

D. **DEWATERING**: Should water be encountered, the Contractor shall furnish and operate suitable pumping equipment of such capacity adequate to dewater the trench. The trench shall be sufficiently dewatered so that the laying and joining of the pipe is made in the dry. The Contractor shall convey all trench water to a natural drainage channel or storm sewer without causing any property damage.

E. **CONSTRUCTION EQUIPMENT**: Where mains are located in or adjacent to pavements, all backfilling and material handling equipment shall have rubber tires. Crawler equipment shall be permitted when there is no danger of damaging pavement.

F. **TRENCH SUPPORT**: Supporting open cuts for mains shall be the responsibility of the Contractor where trenching may cause unnecessary damage to street pavement, trees, structures, poles, utilities, or other private or public property. During the progress of the work, whenever and wherever it is necessary, the Contractor shall, at his expense, support the sides of the excavation by adequate and suitable sheeting, shoring, bracing, or other approved means. Such trench support material and equipment shall remain in place until backfilling operations have progressed to the point where the supports may be withdrawn without endangering property.

G. **NOISE DUST AND ODOR CONTROL:** The Contractor's construction activities shall be conducted so as to eliminate all unnecessary noise, dust and odors.

H. **DISINFECTION AND LEAKAGE TESTING:** See Section "Disinfection and Leakage Testing."

I. **TRENCH EXCAVATION AND BOTTOM PREPARATION**

1. **General**: The Contractor shall perform all excavation of every description and of whatever substances encountered to the depths indicated on the drawings or as otherwise specified. During excavation material suitable for backfilling shall be piled in an orderly manner a sufficient distance form the banks of the trench to avoid overloading and to prevent slides or cave-ins. All excavated materials not required or suitable for backfill shall be removed and wasted at a site acquired by the Contractor and approved by the Engineer. Topsoil shall be stripped from the excavation area before excavation begins.

   Such grading shall be done as may be required to prevent surface water from flowing into trenches or other excavations, and any water accumulating therein shall be removed by pumping or other approved

methods. The trench shall be sufficiently dewatered so that the laying and joining of pipe is made in the dry. The Contractor shall take whatever action necessary to insure that water pumped from the trench will not damage private property. If necessary the Contractor shall haul trench water to another suitable location for disposal.

Such sheeting and shoring shall be furnished and installed by the Contractor, at his own expense, as may be necessary for the protection of the work, protection of other utilities, protection of structures, the safety of the personnel, and the safety of the public. All shoring shall be removed when the work is completed unless directed otherwise by the Engineer. The Contractor shall also furnish whatever barricades or fencing necessary to provide for the safety of pedestrians in excavation areas and for traffic control as discussed in other sections. All open trenches shall be adequately covered, barricaded and/or backfilled during non-working hours in order to adequately protect vehicular and pedestrian traffic.

The Contractor shall excavate whatever material encountered. Trenches shall be excavated to the widths shown in the table headed "Trench Width" or as otherwise indicated in the plans, and the banks shall be as nearly vertical as practicable. The bottom of the trenches shall be accurately graded to provide uniform bearing and support for each section of the pipe or conduit on undisturbed soil at every point along its entire length, except for bell holes and for the proper sealing of the pipe joints. Bell holes and depressions in order that the pipe rest upon the prepared bottom for as nearly its full length as practicable, shall be only of such length, depth, and width as required for properly making the particular type of joint. Additional depth shall be excavated in rock as described elsewhere herein.

Except in cases where the elevations of the water lines are indicated on the plans, trenches for water line shall be of a depth that will provide a minimum cover over the top of the pipe of 900 mm (36 inches) from the indicated finished grade, and avoid interference of the water lines with other existing or proposed utilities. Where the note occurs, "Slope to Drain", the Contractor shall manage to keep a positive slope in that direction in order that air may travel to the air vent. Where paved surfaces are to be disturbed by an open cut, the Contractor shall provide suitable machinery to cut the edges of the pavement in a smooth straight line.

2. **Rock**: The word "rock" wherever used as the name of an excavated material, shall mean boulders and solid masonry larger than .3823 cubic meter (1/2 cubic yard) in volume, or solid ledge rock and masonry which, in the opinion of the Engineer, requires for its removal, drilling and blasting, wedging, sledging, barring, or breaking up with a power operated hand tool. Any material which can be excavated using a hand pick and shovel, power operated excavator, power operated backhoe or power operated shovel shall not be defined as rock.

3. **Blasting Rock**: No blasting of rock shall be done within 12 m (40 feet) of pipes or structures without specific permission from the Engineer. Blasts shall be properly covered and the pipe or structure properly protected.

Warnings shall be given to all persons in the immediate vicinity. Blasting shall be at the risk of the Contractor who shall be liable for all damages to persons or property. Necessary permits shall be secured and paid for by the Contractor.

4. **Trench Width**: Widths of trenches shall be held to a minimum to accommodate the pipe and appurtenances. The trench width shall be measured at the top of the pipe barrel and shall conform to the following limits:

Earth

a. Minimum - outside diameter of the pipe barrel plus 200 mm (8 inches), 100 mm (4 inches) each side of pipe.

Maximum - nominal pipe diameter plus 600 mm (24 inches).

Rock

Minimum – 600 mm (24") or less, nominal pipe size: outside diameter of pipe barrel plus 300 mm (12”), @ 150 mm (6”) each side.

Minimum - Larger than 600 mm (24"), nominal pipe size: outside diameter of pipe barrel plus 350 mm (18”), @ 325 mm (9”) each side.

Maximum - nominal pipe diameter plus 600 mm (24”).

b. **Butterfly Valves:**. Trench width shall be over excavated 600 mm (24") on the side that the operating mechanism is located on the butterfly valve when the surrounding area cannot be hand dug.

c. **Structures**: The minimum excavation limits for structures shall be as indicated. In rock, the excavation limits shall not exceed 300 mm (12 inches) from the outside wall and 150 mm (6 inches) below the footer.

5. **Excessive Trench Width**: If, for any reason the trench width exceeds the maximum trench width defined in paragraph "Trench Width", the Contractor, subject to approval of the Engineer, shall provide compacted stone bedding, additional strength pipe or concrete encasement, at the contractor expense.

6. **Bottom Preparation**: The Contractor shall use excavation equipment that produces an even foundation. For the entire length of the trench, a compacted layer of sand bedding material shall be installed below the pipe. Bell holes and depressions for joints, valves, and fittings shall be dug after the trench bedding has been graded in order that the pipe rest upon the prepared bedding for as nearly its full length as practicable. Bell holes and depressions shall be only of such length, depth, and width as required for properly making the particular type of joint.

a. **Earth:** The trench shall be excavated to the depth required, so as to provide a uniform and continuous bearing and support for the pipe barrel. A minimum of a 80 mm (6") sand shall be installed on the solid

and undisturbed ground. The finished trench bottom shall be accurately prepared by means of hand tools.

b. **Rock**. Where excavation is made in rock or boulder, the trench shall be excavated 6 inches below the pipe barrel for pipe 600 mm (24 inches) in diameter or less, and inches for pipe larger than 600 mm (24 inches) in diameter. All loose material shall be removed from the trench bottom. After preparation of the trench bottom, a pipe bed shall be prepared using sand and thoroughly compacted. The bedding material shall be spread the full width of the trench bottom.

7. **Water Main Depth**: Mains 300 mm (12") and less in size shall be not less than 900 mm (36") in depth and no more than 1,200 mm (48") in depth, unless otherwise specified. Mains larger than 300 mm (12") shall be installed as shown on the plans.

8. **Excessive Trench Depth**: If, for any reason, the trench depth exceeds the trench depth shown on the Plans, the Contractor is responsible for any and all additional cost incurred for the excessive depth.

9. **Foundation:** The mains are to be built on a good foundation. If, in the Engineer's opinion, the material forming the trench bottom is not suitable for a good foundation, a further depth shall be excavated and the same filled with suitable material. Unauthorized excavation below the trench bottom shall be filled with compacted crushed stone at the Contractor expense.

J. **PIPE, VALVE, HYDRANT AND METER SETTING INSTALLATION**

The provisions of AWWA C600 shall apply in addition to the following:

1. Pipe shall not be laid in water or when trench or weather conditions are unsuitable for the work except when permitted by the Engineer. Unless otherwise indicated in the plans or in Section I, Bid Item Explanations, the material shall be new and unused. The interior of the pipe shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations by plugging or other approved methods. Pipe shall be laid with bell ends facing in the direction of laying, unless otherwise directed by the Engineer. After placing a length of pipe in the trench, the spigot end shall be centered in the bell of the pipe and forced home. All pipe shall be laid with ends abutting and true to line and grade. Deflection of pipe joints in excess of the manufacturer's recommendations will not be permitted. A watertight pipe plug or bulkhead shall be provided and used to prevent the entrance of foreign material whenever pipe laying operations are not in progress. Any pipe that has the grade or joint disturbed after laying shall be taken up and relayed. Any section of pipe found to be defective before of after laying shall be removed and replaced at the Contractor's expense.

2. **Pipe Cutting:**: The cutting of pipe for installing valves, fittings, or hydrants shall be done in a neat and workmanlike manner without damage to the pipe or lining. The end shall be smooth and at right angles to the axis of

the pipe. Flame cutting of metal pipe by means of an oxyacetylene torch shall not be permitted. All pipe cutting shall be at the Contractor's expense.

3. **Push-On Joints:** The surfaces with which the rubber gaskets comes in contact shall be thoroughly cleaned just prior to assembly. The gasket shall then be inserted into the groove in the bell. Before starting joint assembly, a liberal coating of special lubricant shall be applied to the spigot end. (Special lubricant shall be suitable for use in potable water) With the spigot end centered in the bell, the spigot end is pushed home.

4. **Mechanical Joints**: Mechanical joints require that the spigot be centrally located in the bell. The surfaces with which the rubber gasket comes in contact shall be thoroughly cleaned just prior to assembly. The clean surfaces shall be brushed with a special lubricant just prior to slipping the gasket over the spigot end and into the bell. (Special lubricant shall be suitable for use in potable water) The lubricant shall also be brushed over the gasket prior to installation to remove the loose dirt and lubricate the gasket as it is forced into its retaining space. P.V.C. pipe spigot ends shall be field cut smooth and at right angles to the axis of the pipe for installation in mechanical joint fittings.

   a. **Bolt Torque**: The normal range of bolt torque to be applied to standard cast iron bolts in a joint are:

RANGE OF TORQUE	
Size	In Foot - Pounds
5/8“	40 - 60
3/4“	60 - 90
1”	70 - 100
1-1/4”	90 - 120

5. **Restrained Joints**

   a. **Ball and Socket:** Ball and Socket joints shall be assembled and installed according to the manufacturer’s recommendations. The joint shall be thoroughly cleaned and lubricated. Check the retainer ring fastener. After installation, all slack shall be taken out of the pipe joint.

   b. **Push-On**: Assemble and install the push-on joint according to the manufacturer’s recommendations. Restrained joint-type pipe and fittings shall only be used as approval by the Engineer. Retaining glands, field lock gaskets, or retaining flanges shall not be considered as providing a restrained joint. The joint shall be thoroughly cleaned and lubricated. Check the retainer ring fastener. After installation, all slack shall be taken out of the pipe joint.

6. **Setting Valves:** Valves shall be set on a firm solid concrete block foundation so that no load will be transferred to the connecting pipe. Valves in water mains shall, where possible, be located on the street property lines extended, unless otherwise shown on the plans. A valve box

shall be provided for every valve. The valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the operating nut of the valve. The box cover shall be set flush with the surface of the finished pavement unless otherwise shown. All valves boxes with the exception of isolating valves for fire hydrants that are located in non-paved areas shall have a minimum of 600 mm x 600 mm x 100 mm (2'x2'x4") concrete pad as shown in Standard Drawing.

7. **Setting Hydrants**: Hydrants shall be located as shown on the plans or as directed by the Engineer. The location shall provide complete accessibility and minimize the possibility of damage from vehicles or injury to pedestrians. All hydrants shall stand plumb with the pumper nozzle facing the curb. Hydrant shall be set to the established grade, with the traffic flange within 100 mm (4") above final grade in accordance to Standard Drawing. Each hydrant shall be controlled by an independent gate valve with valve box. All valves used for hydrant control shall be anchored to the branch tee.

8. **Thrust Blocking**: All bends over five (5) degrees, plugs, caps, and tees shall be securely blocked against movement with concrete thrust blocks placed against undisturbed earth in accordance with Standard Drawing. Thrust blocks shall be approved by the Engineer prior to backfilling. Water mains shall have concrete thrust block at all pipe intersections and changes of direction to resist forces acting on the pipeline. All concrete thrust blocks shall be poured in such a manner that the bolts can be replaced without disturbing the blocking.

   All caps or plugs used in mains to undergo hydrostatic test shall be properly installed and blocked in advance of testing mains. All caps or plug installations shall be approved by the Engineer's representative before the main is subjected to the pressure test.

   a. **Concrete Blocking**: Concrete blocking shall be K.D.O.T. Class A concrete as specified in Section "Concrete". Blocking shall be placed between undisturbed ground and the fitting to be anchored. The area of bearing on the fitting and on the ground in each instance shall be that shown herein. The blocking shall, unless otherwise shown, be so placed that the pipe and fitting joints will be accessible for repair.

   b. **Tie Rods:** If shown or specified, movement shall be prevented by attaching suitable metal rods, clamps or restrained fittings. Steel tie rods or clamps, where permitted, shall be of adequate strength to prevent movement. Steel tie rods or clamps shall be painted with three coats of an approved bituminous paint or coal tar enamel. A minimum of 3/4" welded eye bolts @ a 90 degree bend and 3/4" threaded rods may only be used with the approval of the Engineer for temporary restraint only. Duc-Lucs are prohibited for use.

   c. **Restrained Fittings**: Restrained fittings, where permitted, shall be subject to the approval of the Engineer.

9. **Meter Setting Installation**

The Contractor shall furnish all labor, equipment, excavation, backfill, testing, disinfection, and restoration to install the pipe 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 or for bedding required in rock excavation. It will be the Contractors responsibility to remove and reset the service at his own expense if he fails to notify and receive the approval from the District. Contractors work shall be warranted for a period of one year of the date of activation of each service (meter set date).

a. **Inspection & Notification**: The Contractor shall notify all affected District customers prior to interrupting water service. The Contractor shall make 24 hours notification. Routine service inspection and final inspections will be made by the District upon request by the Contractor and in a timely manner. The Contractor shall provide the District 24 hours notification for inspection by the District. It is the Contractors responsibility to post “No Parking” signs and safety devices.

b. **Installation of Service Lines**: The Contractor shall be familiar with copper piping, fittings and connections, and have available equipment to work with said materials. No sweat type fittings shall be permitted. Service line shall be installed as shown on the plans or as directed by the District. The Contractor shall excavate whatever material encountered. The service lines shall be installed using boring and jacking or open cut (as specified on the plans) at the depth required to clear existing and proposed sewers, but in no case shall the line be installed with less than 36 inches cover from final grade. The trench width shall be as excavated to a maximum of 2 feet. The line shall be laid on firm soil. In rock, sufficient extra depth shall be excavated and refilled with acceptable compacted soil or bedding sand to provide a cushion for the elimination of the possibility of crushing or perforating the pipe. Connections shall be made using normal practices for water line installation and in accordance with the standards in the plans or contained herein.

1. **Water Service Taps**: The Contractor shall maintain a minimum of 36” cover over any tap. The corporation installed into the main shall have no more the 4 threads showing between the top of the water main and the bottom of the corporation.

2. **Service Line:** The Contractor shall maintain a constant cover of 36”over any water line. Methods of pushing or jacking under the existing street must avoid bending or kinking the pipe. No open cuts of the pavement will be permitted unless pre-approved by the District. All copper shall be cut using a copper-tubing cutter. All connections shall be flared connections. No oil base or other contaminating materials will be used in lubricants, caulking and sealers. The Contractor shall be responsible for making all joints watertight.

3. **Meter Vault**: All meter vaults shall be located inside existing right-of-ways or water main easements of record or as directed by the District. Typically the meter vault shall sit 5' behind the back edge of curb or edge of pavement. The Contractor shall contact the customer and determine a suitable location of the setting within the above guidelines. It is the Contractors responsibility to notify the District's Inspector if these conditions cannot be met. The District's Inspector will inspect any questionable meter setting location prior to the Contractor installing.

   Meter vaults shall be set to allow the meter cover to be level with the back edge of the existing curb or the back edge of paving along roadways without curbs. It is the Contractor's responsibility to ensure that the meter vault does not settle due to poor compaction or any other reason within the Contractor's control. The Contractor at no additional expense to the District shall adjust any meter vault that sinks below grade due to poor workmanship by the Contractor to grade.

K. **TRENCH BACKFILL**

All trench backfill shall be free from cinders, refuse, organic material, boulders, rocks or other material Engineer is unsuitable whic in thhe opinion of the. No backfill shall be made with frozen material.

1.
by the Engineer, flowable fill shall be per Special Note 7X of the Ky. **BACKFILL**

a. **Trench Bottom Preparation:** The pipe shall be bedded on sand to achieve full pipe barrel support. In any event not less than 80 mm (6") of sand bedding shall be used.

b. **Backfill to 300 mm (12") Over Pipe Barrel:** All trench excavations shall be backfilled immediately after pipe is laid with the exception of thrust blocks. Compacted sand shall be used to backfill the trench from the bottom of the pipe barrel to the 300 mm (12") over the pipe barrel. No flushing of backfill shall be permitted to achieve compaction. Clay bulkheads shall be installed as specified under Bulkheads Section.

c. **Remaining Trench Backfill:** From 300 mm (12") above the pipe barrel to the surface, compacted earth or flowable fill may be used as backfill material. No material shall be used for backfill that contains frozen earth, vegetation or organic material, debris, rocks **200 mm (8")** or larger measured in any direction, or earth with an exceptionally high void content.

d. **Compaction:**. All backfill shall be placed in uniform loose layers, not to exceed 300 mm (12") layers, and each layer shall be compacted to a density not less than 95 percent of the standard Proctor maximum dry density (ASTM D698). The backfill shall be compacted in such a manner and with appropriate equipment so that there is no pipe

damage, pipe misalignment or damage to joints. No flushing of backfill shall be permitted to achieve compaction.

e. **Bulkheads:** When a granular bedding is provided in rock or when granular backfill is used, the Contractor shall place bulkheads of clay soil across the trench at 30.48 m (100') intervals to resist the movement of groundwater through the granular material. Such bulkheads shall be carefully compacted and shall extend approximately 900 mm (3 feet) in a direction parallel to the pipe and shall extend from the bottom of the trench to a point 100 mm (4") below final grade level.

f. **Flowable Fill as Backfill:** As required Department of Highways Standard Specifications for Road and Bridge Construction.

g. **Surface Conditions:** The trench surface shall be periodically attended to during the course of the contract. The trench surface shall be maintained in a safe condition and shall not interfere with natural drainage.

L. **INSTALLATION OF PIPE BY BORING OR JACKING**: At certain locations where designated on the plans, the Contractor will be required to install pipe under paved areas or other obstacles by boring a hole large enough to pull the pipe through without obstructing the designated area, or by jacking, whichever is the most feasible.

M. **WATER METERS**: Water Meters shall be installed at locations shown on the plans. The meter shall be constructed as shown on Standard Drawings contained herein or in the plans.

N. **CONNECTIONS (TIE-INS) TO EXISTING WATER LINES:** All connections to existing water lines shall be made at location shown on the plans. Care shall be taken in each case that none of the sterilizing water may enter the system during the sterilizing operation. Each connection shall be preceded with a one inch corporation stop and drain to allow bleeding of the water line of air and sterilizing water. This corporation stop shall be furnished and installed at the Contractor's expense. All sections of pipe and appurtenances to be used for tie-ins and not sterilized shall be thoroughly cleaned by scrubbing with a chlorine solution prior to installation. All tie-ins of mains shall be done with transitional or straight solid sleeves. Mains shall be flushed of sterilizing water before tie-ins to existing mains are made.

O. **INSTALLATION OF SERVICE LINES**: Service line shall be installed as shown on the plans or as directed. The Contractor shall excavate whatever material encountered. The service lines shall be installed using boring and jacking or open cut (as specified on the plans) at the depth required to clear existing and proposed sewers, but in no case shall the line be installed with less than 900 mm (36") cover from final grade. The trench width shall be as excavated to a maximum of 600 mm (2'). The line shall be laid on firm soil. In rock, sufficient extra depth shall be excavated and refilled with acceptable compacted soil or bedding sand to provide a cushion for the elimination of the possibility of crushing or perforating the pipe. Connections shall be made using normal practices for water line installation and in

accordance with the standards in the plans or contained herein. Backfill shall meet the same requirements as that described in PIPE TRENCH BACKFILL.

P. **APPLICABLE SPECIFICATIONS & STANDARDS**

The following specifications and standards form a part of these Specification:

1. **American Water Works Association** (AWWA) Standards

2. **Boone County Water District** Standard Drawings & Specifications

3. "Manual of Accident Prevention in Construction" published by the **Associated General contractors of America**

4. **Kentucky Occupational Safety and Health Administration's** "Kentucky Occupational Safety and Health Standards for General Industry" current edition.

5. **American National Standards Institute** (ANSI)

6. **American Society for Testing & Materials** (ASTM)

7. **Kentucky Division of Water Quality**

8. **"Recommended Standards for Water Works"** current edition

Q. **INSTALLATION OF PIPE BY DIRECTIONAL DRILLING**

Part 1 – General Description of Work

a. The CONTRACTOR shall provide all investigation, planning, geotechnical work, equipment, labor, etc. necessary to properly install the proposed directional bores as indicated on the construction using horizontal directional drilling (directional boring) technology. Pipe materials shall match those indicated on the plans.

b. Submittals

Shop drawings and manufacturer's literature shall be submitted to the OWNER'S Engineer for approval.

Part 2 - Products

a. Pressure Pipe and Fittings for Horizontal Directional Drilling

(1) Ductile iron pipe for horizontal directional drilling.

(a) Ductile Iron Pipe for horizontal directional drilling shall be restrained and boltless flexible joint pipe as approved by the OWNER'S Engineer.

(b) The joints shall meet the requirements of ANSI/AWWA C111/A21.11.

b. Polyvinyl chloride pipe (pvc) for horizontal directional drilling.

(1) Products delivered under this specification shall be manufactured only from water distribution pipe and couplings conforming to AWWA C900 or AWWA C905, as appropriate for the size of the watermain indicated on the plans. Pipe materials and joints shall be rated for 200 psi or greater.

(2) Pipe and couplings shall be made from unplasticized PVC compounds having a minimum cell classification of 12454-B, as defined in ASTM D1784. Pipe, couplings, and locking splines shall be completely non-metallic. The compound shall qualify for Hydrostatic Design Basis (HDB) of 4000 psi for water at 73.4°F, in accordance with the requirements of ASTM D2837.

(3) Pipe shall be joined using non-metallic couplings to form an integral system for maximum reliability and interchangeability. High-strength, flexible thermoplastic splines shall be inserted into mating, precision-machined grooves in the pipe and coupling to provide full 360° restraint with evenly distributed loading.

(4) Couplings shall be designed for use at or above the rated pressures of the pipe with which they are utilized, and shall incorporate twin elastomeric sealing gaskets meeting the requirements of ASTM F477. Joints shall be designed to meet the leakage test requirements of ASTM D3139.

c. Fusible Polyvinylchloride Pipe

Part 1 - General

Description

(1) Scope

This section specifies fusible polyvinylchloride pipe, including standards for dimensionality, testing, quality, acceptable fusion practice, safe handling and storage.

(2) Pipe Description

(a) Pipe supplier shall furnish fusible polyvinylchloride pipe conforming to all standards and procedures, and meeting all testing and material properties as described in this specification.

(b) Pipe shall conform to the following dimensionality and general characteristics table:

Pipe Description	Nominal Diameter (in.)	DR	Color	Pressure Class (psi)
Fusible C-905® Water Main	16	21	Blue	200

Quality Assurance

(3) References

(a) This section contains references to the following documents. They are a part of this section as specified and modified. Where a referenced document contains references to other standards, those other standards are included as references under this section as if referenced directly. In the event of a conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

(b) Unless otherwise specified, references to documents shall mean the documents in effect at the time of design, bid, or construction, whichever is earliest. If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the

last version of the document before it was discontinued.

(c) Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, regardless of whether the document has been superseded by a version with a later date, discontinued or replaced.

Reference	Title
ANSI/AWWA C110/A21.10	American National Standard for Ductile-Iron and Gray-Iron Fittings, 3-inch through 48-inch, for Water and Other Liquids
ANSI/AWWA C111/A21.11	American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
ANSI/AWWA C153/A21.53	AWWA Standard for Ductile-Iron Compact Fittings for Water Service
AWWA C605	Standard for Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water
AWWA C651	Standard for Disinfecting Water Mains
AWWA C900	Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 in. through 12 in. (100mm Through 300mm), for Water Distribution
AWWA M23	AWWA Manual of Supply Practices PVC Pipe—Design and Installation, Second Edition
ASTM C923	Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals
ASTM D1784	Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
ASTM D1785	Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
ASTM D2152	Test Method for Degree of Fusion of Extruded Poly(Vinyl Chloride) (PVC) Pipe and Molded Fittings by Acetone Immersion
ASTM D2241	Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR)
ASTM D2665	Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
ASTM F477	Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F1057	Standard Practice for Estimating the Quality of Extruded Poly (Vinyl Chloride) (PVC) Pipe by the Heat Reversion Technique
ASTM F1417	Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air
UNI-B-6	Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe
UNI-PUB-08	Tapping Guide for PVC Pressure Pipe
NSF-14	Plastics Piping System Components and Related Materials

Reference	Title
NSF-61	Drinking Water System Components--Health Effects
PPI TR-2	PVC Range Composition Listing of Qualified Ingredients

(4) Manufacturer Requirements

(a) All piping shall be made from PVC compound conforming to cell classification 12454 per ASTM D1784.

(5) Fusion Technician Requirements

(a) Fusion Technician shall be fully qualified by the pipe supplier to install fusible polyvinylchloride pipe of the type(s) and size(s) being used. Qualification shall be current as of the actual date of fusion performance on the project.

(6) Specified Pipe Suppliers

(a) Fusible polyvinylchloride pipe shall be used as manufactured under the trade names Fusible C-900® and FPVC®, for Underground Solutions, Inc., Poway, CA, (858) 679-9551. Fusion process shall be as patented by Underground Solutions, Inc., Poway, CA, Patent No. 6,982,051. Owner and engineer are aware of no other supplier of fusible polyvinylchloride pipe that is an equal to this specified pipe supplier and products.

(7) Warranty

(a) The pipe shall be warranted for one year per the pipe supplier's standard terms.

(b) In addition to the standard pipe warranty, the fusion services shall be warranted for one year per the fusion service provider's standard terms.

(8) Pre-Construction Submittals

(a) The following PRODUCT DATA is required from the pipe supplier and/or fusion provider:

1 Pipe Size

2- Dimensionality

3- Pressure Class per applicable standard

4- Color

5- Recommended Minimum Bending Radius

6- Recommended Maximum Safe Pull Force

7- Fusion technician qualification indicating conformance with this specification

(9) Post-Construction Submittals

(a) The following AS-RECORDED DATA is required from the contractor and/or fusion provider to the owner or pipe supplier upon request:

1- Approved datalogger device reports

2- Fusion joint documentation containing the following information:

a- Pipe Size and Thickness
b- Machine Size
c- FusionTechnician Identification
d- Job Identification
e- Fusion Joint Number
f- Fusion, Heating, and Drag Pressure Settings
g- Heat Plate Temperature
h- Time Stamp
i- Heating and Cool Down Time of Fusion
j- Ambient Temperature

(10) Products

Fusible Polyvinylchloride pressure pipe for potable water

Fusible polyvinylchloride pipe shall conform to AWWA C900 for standard dimensions. Testing shall be in accordance with AWWA C900.

(11) Fusible polyvinylchloride pipe shall be extruded with plain ends. The ends shall be square to the pipe and free of any bevel or chamfer. There shall be no bell or gasket of any kind incorporated into the pipe.

(12) Fusible polyvinylchloride pipe shall be manufactured in a standard 40’ or 45’ nominal length, or custom lengths as specified.

(13) Fusible polyvinylchloride pipe shall be blue in color for potable water use.

(14) Pipe shall be marked as follows:

(a) Nominal pipe size

(b) PVC

(c) Dimension Ratio, Standard Dimension Ratio, or Schedule

(d) AWWA pressure class

(e) AWWA standard designation number

(f) NSF-61 mark verifying suitability for potable water service

(g) Extrusion production-record code

(h) Trademark or trade name

(i) Cell Classification 12454 and/or PVC material code 1120 may also be included

(15) Pipe shall be homogeneous throughout and be free of visible cracks, holes, foreign material, blisters, or other visible deleterious faults.

(16) Fusion Joints

Unless otherwise specified, fusible polyvinylchloride pipe lengths shall be assembled in the field with butt-fused joints. The Contractor shall follow the pipe supplier's written guidelines for this procedure. All fusion joints shall be completed as described in this specification.

(17) Connections and fittings for pressure applications

Connections shall be defined in conjunction with the coupling of project piping, as well as the tie-ins to other piping systems.

(18) Ductile iron mechanical and flanged fittings

(a) Connections to fusible polyvinylchloride pipe may be made using a restrained or non-restrained retainer gland product for PVC pipe, as well as for MJ or flanged fittings.

(b) Bends, tees and other ductile iron fittings shall be restrained with the use of thrust blocking or other means as indicated in the construction documents.

(c) Ductile iron fittings and glands must be installed per the manufacturer's guidelines.

(d) If required, linings for Ductile Iron fittings shall meet the following requirements for the following service environments:

1- Wastewater:
Ceramic Epoxy shall be Tnemec Perma-Shield 431.
Polyurethane shall be DuraShield 210 or 310.

2- Potable Water:
Liquid Epoxy shall be 100% solids liquid epoxy, Tnemec Epoxyline Series FC22.
Polyurethane shall be DuraShield 210-61 or 310-61.

3- If required, coatings for Ductile Iron fittings shall meet the following requirements for buried and/or immersion service duty:
Polyurethane shall be DuraShield 210 or 310.
Liquid Epoxy shall be 100% solids liquid epoxy, Tnemec Epoxyline Series FC22.
Coal tar epoxy shall be Sherwin Williams Targuard.

(19) PVC Gasketed, Push-On Fittings

Acceptable fittings for use with fusible polyvinylchloride pipe shall include standard PVC pressure fittings conforming to AWWA C900 or AWWA C905.

(a) Acceptable fittings for use joining fusible polyvinylchloride pipe other sections of fusible polyvinylchloride pipe or other sections of PVC pipe shall include gasketed PVC, push-on type couplings and fittings, including bends, tees, and couplings as shown in the drawings.

(b) Bends, tees and other PVC fittings shall be restrained with the use of thrust blocking or other restraint products as indicated in the construction documents.

(c) PVC gasketed, push-on fittings and mechanical restraints, if used, must be installed per the manufacturer's guidelines.

(20) Fusible Polyvinyl Chloride Sweeps or Bends

(a) Fusible polyvinyl chloride sweeps or bends shall conform to the same sizing convention, diameter, dimensional tolerances and pressure class of the pipe being joined using the sweep or bend.

(b) Fusible polyvinyl chloride sweeps or bends shall be manufactured from the same fusible polyvinyl chloride pipe being used for the installation, and shall have at least 2 feet of straight section on either end of the sweep or bend to allow for fusion of the sweep to the pipe installation. There shall be no gasketed connections utilized with a fusible polyvinyl chloride sweep.

(c) Standard fusible polyvinyl chloride sweep or bend angles shall not be greater than 22.5 degrees, and shall be used in nominal diameters ranging from 4 inch through 16 inch.

(21) Sleeve-Type Couplings

(a) Sleeve-type mechanical couplings shall be manufactured for use with PVC pressure pipe, and may be restrained or unrestrained as indicated in the construction documents.

(b) Sleeve-type couplings shall be rated at the same or greater pressure carrying capacity as the pipe itself.

(22) Expansion and Flexible Couplings

(a) Expansion-type mechanical couplings shall be manufactured for use with PVC pipe, and may be restrained or unrestrained as indicated in the construction documents.

(b) Expansion-type mechanical couplings shall be rated at the same or greater pressure carrying capacity as the pipe itself.

(23) Connection Hardware

Bolts and nuts for buried service shall be made of non-corrosive, high-strength, low-alloy steel having the characteristics specified in ANSI/AWWA C111/A21.11, regardless of any other protective coating.

(24) Connections for Gravity Sanitary Sewer and Non-Pressure Applications

The following connections are to be used in conjunction with tie-ins to other non-pressure, gravity sewer piping and/or structures, and shall be as indicated in the construction documents.

(25) PVC Gasketed, Push-On Couplings

(a) Acceptable couplings for joining fusible polyvinylchloride pipe to other sections of fusible polyvinylchloride pipe or other sections of PVC pipe shall include gasketed PVC, push-on type couplings as indicated in the construction documents.

(b) PVC gasketed, push-on fittings and/or restraint hardware must be installed per the manufacturer's guidelines.

(26) Fusible Polyvinyl Chloride Sweeps or Bends

(a) Fusible polyvinyl chloride sweeps or bends shall conform to the same sizing convention, diameter, dimensional tolerances and pressure class of the pipe being joined using the sweep or bend.

(b) Fusible polyvinyl chloride sweeps or bends shall be manufactured from the same fusible polyvinyl chloride pipe being used for the installation, and shall have at least 2 feet of straight section on either end of the sweep or bend to allow for fusion of the sweep to the pipe installation. There shall be no gasketed connections utilized with a fusible polyvinyl chloride sweep.

(c) Standard fusible polyvinyl chloride sweep or bend angles shall not be greater than 22.5 degrees, and shall be used in nominal diameters ranging from 4 inch through 16 inch.

(27) Sleeve-Type Couplings

(a) Sleeve-type mechanical couplings shall be manufactured for use with PVC pipe, and may be restrained or unrestrained as indicated in the construction documents.

(28) Expansion and Flexible Couplings

(a) Expansion-type mechanical couplings shall

be manufactured for use with PVC pipe, and may be restrained or unrestrained as indicated in the construction documents.

(29) Connection Hardware

(a) Bolts and nuts for buried service shall be made of non-corrosive, high-strength, low-alloy steel having the characteristics specified in ANSI/AWWA C111/A21.11, regardless of any other protective coating.

(30) Execution

Delivery and Off-Loading

All pipe shall be bundled or packaged in such a manner as to provide adequate protection of the ends during transportation to the site. Any pipe damaged in shipment shall be replaced as directed by the owner or engineer.

(31) Each pipe shipment should be inspected prior to unloading to see if the load has shifted or otherwise been damaged. Notify owner or engineer immediately if more than immaterial damage is found. Each pipe shipment should be checked for quantity and proper pipe size, color, and type.

(32) Pipe should be loaded, off-loaded, and otherwise handled in accordance with AWWA M23, and all of the pipe supplier's guidelines shall be followed.

(33) Off-loading devices such as chains, wire rope, chokers, or other pipe handling implements that may scratch, nick, cut, or gouge the pipe are strictly prohibited.

(34) During removal and handling, be sure that the pipe does not strike anything. Significant impact could cause damage, particularly during cold weather.

(35) If appropriate unloading equipment is not available, pipe may be unloaded by removing individual pieces. Care should be taken to insure that pipe is not dropped or damaged. Pipe should be carefully lowered, not dropped, from trucks.

Handling and Storage

(36) Any length of pipe showing a crack or which has received a blow that may have caused an incident fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the work. Damaged areas, or possible areas of damage may be removed by cutting out and removing the suspected incident fracture area. Limits of the acceptable length of pipe shall be determined by the owner or engineer.

(37) Any scratch or gouge greater than 10% of the wall thickness will be considered significant and can be rejected unless determined acceptable by the owner or engineer.

(38) Pipe lengths should be stored and placed on level ground. Pipe should be stored at the job site in the unit packaging provided by the manufacturer. Caution should be exercised to avoid compression, damage, or deformation to the ends of the pipe. The interior of the pipe, as well as all end surfaces, should be kept free from dirt and foreign matter.

(39) Pipe shall be handled and supported with the use of woven fiber pipe slings or approved equal. Care shall be exercised when handling the pipe to not cut, gouge, scratch or otherwise abrade the piping in any way.

(40) If pipe is to be stored for periods of 1 year or longer, the pipe should be shaded or otherwise shielded from direct sunlight. Covering of the pipe which allows for temperature build-up is strictly prohibited. Pipe should be covered with an opaque material while permitting adequate air circulation above and around the pipe as required to prevent excess heat accumulation.

(41) Pipe shall be stored and stacked per the pipe supplier’s guidelines.

(42) Fusion Process

General

(a) Fusible polyvinylchloride pipe will be handled in a safe and non-destructive

manner before, during, and after the fusion process and in accordance with this specification and pipe supplier's guidelines.

(b) Fusible polyvinylchloride pipe will be fused by qualified fusion technicians, as documented by the pipe supplier.

(c) Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine.

(d) Only appropriately sized and outfitted fusion machines that have been approved by the pipe supplier shall be used for the fusion process. Fusion machines must incorporate the following elements:

HEAT PLATE - Heat plates shall be in good condition with no deep gouges or scratches. Plates shall be clean and free of any debris or contamination. Heater controls shall function properly; cord and plug shall be in good condition. The appropriately sized heat plate shall be capable of maintaining a uniform and consistent heat profile and temperature for the size of pipe being fused, per the pipe supplier's guidelines.

CARRIAGE – Carriage shall travel smoothly with no binding at less than 50 psi. Jaws shall be in good condition with proper inserts for the pipe size being fused. Insert pins shall be installed with no interference to carriage travel.

GENERAL MACHINE - Overview of machine body shall yield no obvious defects, missing parts, or potential safety issues during fusion.

DATA LOGGING DEVICE – An approved datalogging device with the current version of the pipe supplier's recommended and compatible software shall be used. Datalogging device operations and maintenance manual shall be with the unit at all times. If fusing for extended periods of time, an independent 110V power source shall be available to extend battery life.

(e) Other equipment specifically required for

the fusion process shall include the following:

Pipe rollers shall be used for support of pipe to either side of the machine

A weather protection canopy that allows full machine motion of the heat plate, fusion assembly and carriage shall be provided for fusion in inclement, extreme temperatures, and /or windy weather, per the pipe supplier's recommendations.

An infrared (IR) pyrometer for checking pipe and heat plate temperatures.

Fusion machine operations and maintenance manual shall be kept with the fusion machine at all times.

Facing blades specifically designed for cutting fusible polyvinylchloride pipe shall be used.

(43) Joint Recording

Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine. The fusion data logging and joint report shall be generated by software developed specifically for the butt-fusion of fusible polyvinyl chloride pipe. The software shall register and/or record the parameters required by the pipe supplier and these specifications. Data not logged by the data logger shall be logged manually and be included in the Fusion Technician's joint report.

(44) General Installation

Installation guidelines from the pipe supplier shall be followed for all installations.

(45) The fusible polyvinylchloride pipe will be installed in a manner so as not to exceed the recommended bending radius.

(46) Where fusible polyvinylchloride pipe is installed by pulling in tension, the recommended Safe Pulling Force established by the pipe supplier shall not be exceeded.

(47) Preparation Prior to Making Connections into Existing Piping Systems

Approximate locations for existing piping systems are shown in the construction documents. Prior to

making connections into existing piping systems, the contractor shall:

(a) Field verify location, size, piping material, and piping system of the existing pipe.

(b) Obtain all required fittings, which may include saddles, sleeve type couplings, flanges, tees, or others as shown in the construction documents.

(c) Have installed all temporary pumps and/or pipes in accordance with established connection plans.

(48) Unless otherwise approved, new piping systems shall be completely assembled and successfully tested prior to making connections into existing pipe systems.

(49) Pipe System Connections
Pipe connections shall be installed per applicable standards and regulations, as well as per the connection manufacturer's guidelines and as indicated in the construction documents. Pipe connections to structures shall be installed per applicable standards and regulations, as well as per the connection manufacturer's guidelines.

(50) Tapping for Potable Water Applications

Tapping shall be performed using standard tapping saddles designed for use on PVC piping in accordance with AWWA C605. Tapping shall be performed only with use of tap saddles or sleeves. NO DIRECT TAPPING WILL BE PERMITTED. Tapping shall be performed in accordance with the applicable sections for Saddle Tapping per Uni-Pub-8.

(51) All connections requiring a larger diameter than that recommended by the pipe supplier, shall be made with a pipe connection as specified and indicated on the drawings.

(52) Equipment used for tapping shall be made specifically for tapping PVC pipe:

(a) Tapping bits shall be slotted "shell" style cutters, specifically made for PVC pipe. 'Hole saws' made for cutting wood, steel, ductile iron, or other materials are strictly

prohibited.

(b) Manually operated or power operated drilling machines may be used.

(53) Taps may be performed while the pipeline is filled with water and under pressure (‘wet’ tap,) or when the pipeline is not filled with water and not under pressure (‘dry’ tap).

(54) Testing
Testing shall comply with all applicable jurisdictional building codes, statutes, standards, regulations, and laws.

(55) Hydrostatic Testing and Leakage Testing for Pressure Piping

(a) Hydrostatic and leakage testing for piping systems that contain mechanical jointing as well as fused PVC jointing shall comply with AWWA C605.

(b) Unless agreed to or otherwise designated by the owner or engineer, for a simultaneous hydrostatic and leakage test following installation, a pressure equal to 150% of working pressure at point of test, but not less than 125% of normal working pressure at highest elevation shall be applied. The duration of the pressure test shall be for two (2) hours.

(c) If hydrostatic testing and leakage testing are performed at separate times, follow procedures as outlined in AWWA C605.

(d) In preparation for pressure testing the following parameters must be followed:

1- All air must be vented from the pipeline prior to pressurization. This may be accomplished with the use of the air relief valves or corporation stop valves, vent piping in the testing hardware or end caps, or any other method which adequately allows air

to escape the pipeline at all high points. Venting may also be accomplished by 'flushing' the pipeline in accordance with the parameters and procedures as described in AWWA C605.

2- The pipeline must be fully restrained prior to pressurization. This includes complete installation of all mechanical restraints per the restraint manufacturer's guidelines, whether permanent or temporary to the final installation. This also includes the installation and curing of any and all required thrust blocking. All appurtenances included in the pressure test, including valves, blow-offs, and air-relief valves shall be checked for proper installation and restraint prior to beginning the test.

3- Temporary pipeline alignments that are being tested, such as those that are partially installed in their permanent location shall be configured to minimize the amount of potentially trapped air in the pipeline.

(56) Disinfection of the Pipeline for Potable Water Piping

(a) After installation, the pipeline, having passed all required testing, shall be disinfected prior to being put into service. Unless otherwise directed by the owner or engineer, the pipeline will be disinfected per AWWA C651.

(57) Partial Testing

(a) Segments of the pipe may be tested separately in accordance with standard testing procedure, as approved by the owner and engineer.

d. High-density polyethylene (HDPE) for horizontal directional drilling

(1) Pipes: HDPE forcemain pipe shall meet the requirements for Type III, Grade P345 Polyethylene Material as defined in ASTM Specification D-1248 (PE 3408). The minimum pressure class/SDR rating acceptable shall be Class 200/SDR 11. The pipe shall be DIPS and shall have an interior diameter no less than the piping that it is connected to.

(2) Joints: Joints shall be of a heat fusion joining system. Pipe and fittings shall be thermal butt fusion, saddle fusion, or socket fusion in accordance with manufacturer recommended procedures and ASTM D-2161. At the point of fusion, the outside diameter and minimum wall thickness of the fitting shall match the outside diameter and minimum wall thickness specifications of ASTM D-1248 for the same size pipe.

Joining of the pipes and fittings shall be performed in accordance with ASTM D 2774. Depending upon the installation requirements and site location, joining shall be performed within or outside the excavation. Joints of the pipe sections shall be smooth on the inside and internal projection beads shall not be greater than 3/16 inch.

The tensile strength at yield of the butt-fusion joints shall not be less than the pipe. A specimen of the pipe cut across the butt-fusion joints shall be tested in accordance with ASTM D-638.
The manufacturer shall provide fusion training. The contractor and the onsite joint inspector shall be trained by the manufacturer or manufacturer's authorized representative.

The fusion equipment and operator shall be required to demonstrate successful field experience. Regarding fusion over 36"

capability, the fusion unit shall be field tested for a period of five years and the fusion operator shall be pipe size experience of the same size pipe on this project for five years or longer.

(3) Fittings: All fitting shall be provided as indicated on the plans. HDPE Fittings shall be of the same material and class as the pipe and shall be manufactured by the manufacturer of the pipe. HDPE Elbows, tees, and wyes shall be manufactured by mitered fabrication. The manufacturer shall have a written specification for all standard mitered fittings, which establishes Quality Control criteria and tolerances. The manufacturer may be required to demonstrate its ability to produce product required by this specification.

Mechanical joint anchor fittings (MJ Adapter or Harvey Adapter) shall be used to transition from ductile iron to HDPE and from HDPE to PVC. The fitting shall be stronger than the pipe in that when it is subjected to tensile stress the pipe will pull apart before the fitting will pull out and the pipe will blow before the fitting will rupture under pressure.

The MJ Adapter shall have a pre-installed stainless steel stiffener, in accordance with Plastic Pipe Institute (PPI) recommendations, to neutralize point-loading, ACQ, creep and loss of gasket seal due to diameter contraction. The stiffener shall be engineered sufficiently thick to avoid redial buckling due to gasket pressure.
The MJ Adapter requires longer bolts and shall be sold with the modified longer bolt kit to avoid construction crew delays or improper installation with too short bolts.

All fittings for forcemains or pressure rated fittings shall be rated according to the manufacturer’s written specifications, and clearly labeled on the fittings as such.

(4) Installation: The installation shall conform to the requirements of the manufacturer, the AWWA Standard, and as indicated on the plans and specified herein.

(5) Marking and Certification: Each length of HDPE sanitary sewer shall be clearly marked with the Manufacturer's Name, Tradename or Trademark, Nominal pipe size, Pipe Stiffness, Production Code/Extrusion Code, Material Cell Class Designation and ASTM number.

The pipe manufacturer shall provide certification that the stress regression testing has been performed on the specific product. The said certification shall include a stress live curve per ASTM D-2837. The stress regression testing shall have been performed in accordance with ASTM D-2837, and the manufacturer shall provide a product supplying a minimum Hydrostatic Design Basis of 1,600 psi as determined by ASTM D-2837. This certification shall also state that the pipe was manufactured from one specific resin in compliance with these specifications. The certificate shall state the specific resin used and its source.

e. Part 3 – Execution
Materials

(1) Piping and conduits installed by horizontal directional drilling (directionally bore) shall be HDPE, PVC, DI or Steel as indicated in the plans and other sections of these specifications.

f. Installation

(1) Depths of all existing utilities must be confirmed by the CONTRACTOR prior to the crossing to avoid conflicts. Equipment shall be utilized that does not require the conventional bore and receiving pits due to space constraints. Proper connection to the piping at each end shall be done by standard

excavation. The CONTRACTOR shall be responsible to provide a slurry containment pit and shall remove all excess material and dispose of appropriately off-site upon completion. All erosion control facilities shall be provided to contain any solids from migrating beyond the project site. If the CONTRACTOR utilizes a subcontractor for this work, they shall provide proof of adequate comprehensive general liability insurance covering underground collapse and explosion and experience to the ENGINEER and OWNER for prior approval. The CONTRACTOR shall be required to provide all necessary water in accordance with other applicable sections of these specifications.

(2) In all cases the manufacturer's recommendations and procedures shall be followed regarding the installation of their pipe material by horizontal directional drilling.

(3) Subsurface investigation, if deemed necessary, shall be provided prior to bids by the CONTRACTOR. No additional payments will be made if rock is encountered or if soil conditions require additional construction time and equipment. Proper equipment and methods shall be used in rock and soil bores to insure proper grades, elevations and separations.

(4) All directional drilling operations shall be performed by a qualified directional drilling CONTRACTOR with at least (3) years experience involving work of a similar nature to the work required of this project. The CONTRACTOR must have installed a minimum of 10,000 linear feet of pipe (4-inch diameter or greater) using directional drilling operations. A list of project references and proof of contractor experience shall be presented to the ENGINEER, upon request by the ENGINEER.

(5) The requirements of all applicable local and state authorities shall
be followed by the CONTRACTOR.

(6) The piping shall be installed at the minimum depths indicated in the plans and shall deviate no more than six inches along the vertical axis and 2’ along the horizontal alignment.

(7) The CONTRACTOR shall provide accurate As-Built data based on downhole survey data or a walkover location system that indicates *x*, *y* and *z* coordinates of the pipe at least every thirty (30) feet along the alignment or at a midpoint if the bore length is less than thirty (30) feet.

Section IV

DISINFECTION AND LEAKAGE TEST

A. **SCOPE**: This section covers the disinfection of the new water mains, fittings, temporary services and associated appurtenances. The Contractor shall provide all labor, materials, tools, equipment, and incidentals required to test the mains for water tightness and disinfect the mains as directed by the District and as specified herein. Gauges for the test shall be furnished by the Contractor.

B. **TEST SECTION**: After the main has been installed and backfilled all newly installed pipe or any valved section thereof shall be considered a test section.

C. **WITNESS:** All tests performed for each test section shall be witnessed and approved by the District before acceptance. In the event the Contractor performs any test without witness by the District, the Contractor will be required to test the section again in conformance with this specification at no cost to the District.

D. **GENERAL:** All disinfection work shall conform to the requirements of the latest revision of ANSI/AWWA C651 and the requirements of the Kentucky Division of Water. If any State requirements conflict with the provisions of this section, the State requirements shall govern.

Water required for flushing and disinfection work will be provided as stipulated in the temporary facilities.

When it is necessary to interrupt service to water customers, each customer affected shall be notified in advance of the proposed service interruption and its probable duration in accordance with the project requirements.

E. **DISINFECTION PROCEDURE:**. During construction or after the installation of the pipe and fittings is complete, an approved disinfection method, according to governing standards, shall be used. The disinfection solution shall be allowed to stand in the main and associated appurtenances for a period of at least twenty-four (24) hours.

During disinfection, all valves, hydrants, and service line connections shall be operated to ensure that all appurtenances are disinfected. Valves shall be manipulated in such a manner that the strong disinfection solution in the main from flowing back into the supply line. Check valves shall be used if required.

All non-disinfected fittings used for tie-ins or repairs shall be cleaned and swabbed with a liquid sodium hypochlorite disinfecting solution prior to installation.

F. **FINAL FLUSHING:** Upon completion of chlorination but before sampling and bacteriological testing, Contractor shall remove all heavily chlorinated water from the main and temporary services by flushing with potable water at the maximum velocity which can be developed under the direction and control of the District.

The Contractor shall properly neutralize and dispose of the chlorinated water and flushing water in accordance with all applicable regulations. Contractor shall obtain all special waste disposal permits necessary.

G. **DISPOSAL OF HEAVILY CHLORINATED WATER:** Contractor shall apply a de-chlorinating agent to the water to be wasted to neutralize thoroughly the chlorine residual remaining in the water. (See the following table for neutralizing chemicals.) Federal, state, and local regulatory agencies should be contacted to determine special provisions for disposal of heavily chlorinated water.

Chlorine residual of water being disposed of shall be de-chlorinated by treating with one of the chemicals listed in the following table:

Pounds of Chemicals Required to De-chlorinate Various Residual Chlorine Concentrations in 100,000 Gallons of Water*

Residual Chlorine Concentration *mg/L*	Sulfur Dioxide (SO_2)	Sodium Bisulfate (NaHSO3)	Sodium Sulfite (Na_2SO_3)	Sodium Thiosulfate ($Na_2S_2O_3@5H_2O$)
1	0.8	1.2	1.4	1.2
2	1.7	2.5	2.9	2.4
10	8.3	12.5	14.6	12.0
50	41.7	62.6	73.0	60.0

* Except for residual chlorine concentration, all amounts are in pounds.

The Contractor shall provide all necessary materials, equipment and labor for applying the de-chlorinating chemical in a manner such that proper mixing and contact time of the chemical and the heavily chlorinated water is obtained for complete removal of chlorine being flushed. The Contractor shall periodically test the flush water to verify that the chlorine residual is zero.

H. **CHLORINE RESIDUAL TESTS**:. Upon completion of final flushing, the District will perform chlorine residual tests to ensure the chlorine residual in the main and temporary services is not higher than that generally prevailing in the remainder of the water distribution system and is acceptable to the District.

I. **BACTERIOLOGICAL TESTS**

a. After flushing has been completed and the chlorine residual is not greater than 1.2 ppm, a bacteriological sample shall be taken in accordance with the Kentucky Department of Environmental Protection Agency, Safe Drinking Water Act.

b. The mouth of the valve, hydrant, blow-off, etc. shall be sterilized using a propane torch or equivalent and then allowed to flow for a period of not less than 5 minutes.

c. The standard sample shall be collected in sterile bottles, by the representative of the certified laboratory, care being taken not to contaminate the neck of the bottle or stopper during collection.

d. This sample will then be delivered to a certified laboratory by the individual collecting the sample.

e. Copies of the analysis shall be sent to the Boone County Water District inspector directly from the laboratories.

f. In the event that the laboratory analysis shows bacteria present, the line shall be re-chlorinated, sterilized, flushed, and a new sample taken until such time that the line meets the Safe Drinking Water Act Standards.

J. **REDISINFECTION:** Should the bacteriological tests indicate the presence of coliform organisms at any sampling point, the main and temporary services shall be re-flushed, re-sampled, and re-tested. If check samples show the presence of coliform organisms, the main and temporary services shall be re-chlorinated at no additional cost to the District until results acceptable to the District are obtained.

Re-disinfection shall be completed by the continuous feed or by the slug method. Unless otherwise permitted, the chlorination agent shall be injected into the main and temporary services at the supply end through a corporation cock installed in the top of the pipe. All materials, equipment and labor necessary for the re-disinfection shall be supplied by Contractor at no additional cost to the District.

K. **HYDROSTATIC TESTING**: Hydrostatic Testing will be in accordance with AWWA C600. The water main being tested shall have all air expelled by additional flushing or installation of taps on high points in the line. The pressure of the water main shall be gradually increased to obtain a minimum pressure of 7.0 kg/sq.cm (100 psi) over the design pressure 17.5 kg/sq.cm (250 psi). at the lowest elevation point of the water main or as directed by the Engineer. The test will be for a two (2) hour duration and will not vary by more than .35 kg/sq.cm (5 psi). All tests performed for each test section shall be witnessed and approved by a representative of the Engineer, in the event any test is performed without a representative of the Engineer, the Contractor shall be required to test the section again. Leakage is defined as the amount of water used to maintain the test pressure.

Section V

VEHICULAR AND PEDESTRIAN TRAFFIC CONTROL

1. **REFERENCE MATERIALS**: Traffic shall be maintained in accordance with the "Manual on Uniform Traffic Control" published by the Federal Highway Administration, current edition of Kentucky Department of Highways Standard Specifications for Road & Bridge Construction and current KYTC Standard Drawings.

2. **PEDESTRIAN TRAFFIC**: Should the Contractor be required to remove sidewalk or any other pavement used by pedestrians, the Contractor shall construct an approved, safe, alternate route with acceptable paving materials. Approval for alternate routes and temporary paving materials shall be acquired form the Engineer. The Contractor shall also construct temporary barricades and fences as required. No extra payment will be made for construction of temporary pedestrian walkways, fences or barricades required for water line construction, but shall be considered incidental to water line construction.

3. **VEHICULAR TRAFFIC**: Vehicular traffic shall be maintained as required by the referenced materials listed above. The cost of all temporary paving materials for pavement restoration due to water line construction shall be considered incidental to the contract. The cost for all traffic control materials including signs, barricades, etc. shall be considered incidental to the contract. The Contractor shall be required to keep the construction area safe at all times and check that traffic control devices are in place. Should temporary paving materials used for water line construction fail to perform satisfactorily, the Contractor shall repair same at his own expense.

Section VI

TEMPORARY AND PERMANENT RESTORATION

1. **TEMPORARY RESTORATION**: Any street, driveway, parking lot, sidewalk, stairs, walls, etc. disturbed by water line construction which is shown on roadway construction plans to be disturbed by roadway construction may be replaced with temporary materials. These temporary materials and their placement shall be approved by the Engineer prior to placement. The cost for temporary paving materials and their placement shall be considered incidental to the cost of water line construction.

2. **PERMANENT RESTORATION**: Any street, driveway, parking lot, sidewalk, walls, shrubs, etc. disturbed by water line construction, which is shown on roadway construction plans to remain and not be disturbed by roadway construction, shall be replaced in kind. The concrete, asphalt, and stone removed shall be replaced with the same type material, the same thickness as that removed. All pavement shall be removed and replaced to 300 mm (1') beyond the limits of excavation as detailed on drawing contained herein. These permanent materials and their placement shall be approved by the Engineer prior to placement. The Contractor shall reconstruct same to the original lines and grades and in such a manner as to leave all such items in fully as good or better condition than that which existed prior to construction. All restoration work shall conform to the requirements of KYTC Standard Specifications for Road and Bridge Construction and to the drawing for pavement restoration contained herein. The cost for this permanent restoration shall be considered incidental to the cost of the water line construction.

3. **SEEDING AND SODDING**: This work shall be performed under bid items pertaining to same for roadway construction and in accordance with KYTC Standard Specifications for Road and Bridge Construction

Section VII

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

A. METHOD OF MEASUREMENT

1. **Ductile Iron Water Line**: Each type and size shall be measured by the linear foot laid in the trench, along the center line of the pipe, thru valves and fittings, to point of contact with existing lines.

2. **Service Pipe**: All sizes shall be measured by the linear foot laid in the trench, excluding meter settings, from water main or existing service line to existing service line.

3. **Water Line Undercut**: When directed by the Engineer shall be measured along the subgrade for length and width and from pipe subgrade or bottom of fill, if in a fill placed for roadway as a part of this same contract, to bottom of undercut. Water line undercut shall be measured and paid by the cubic yard.

4. **Method of Measurement For All Other Items**: Shall be by each or lump sum as specified for that particular item in "SECTION I, BID ITEM EXPLANATIONS" contained herein.

B. BASIS OF PAYMENT

1. **Excavation** for water lines from the surface to water line subgrade or to 150 mm (6") below water line subgrade in rock, for structures, for service lines, or for any other water system item will not be a bid item but shall be considered incidental to the bid item to which it pertains. No additional payment will be made for rock excavation.

2. **Water Line Undercut** when directed by the Engineer and/or BCWD, shall be paid by the cubic meter. The accepted quantities of water line undercut will be paid at the agreed unit price of $15 per cubic yard (which shall also include acquisition and placement of acceptable refill material. Should the Contractor be directed to perform water line undercut, the item "Water Line Undercut" at the agreed unit price of $15 per cubic yard shall be added to the contract by change order.

3. **Water Main Fittings** shall be paid EACH, couplings in tie-ins and all fittings in offsets shall be considered incidental to those items.

4. **Backfill** for all phases of water line construction shall not be paid separately but shall be considered incidental to water line construction.

5. **Temporary Restoration** of streets, roadways, sidewalks, steps, walls, trees, shrubs, etc. shall be considered incidental to water line construction when damaged by water line construction. The cost for this temporary restoration shall be considered incidental to the cost of the water line construction.

6. **Traffic Control and Maintenance of Traffic** for a water line construction shall not be paid separately but shall be considered incidental to water line construction.

7. **Basis of Payment for all Other Items** shall be by cubic yard, ton, linear foot, square yard, each, or lump sum as specified for that particular item.

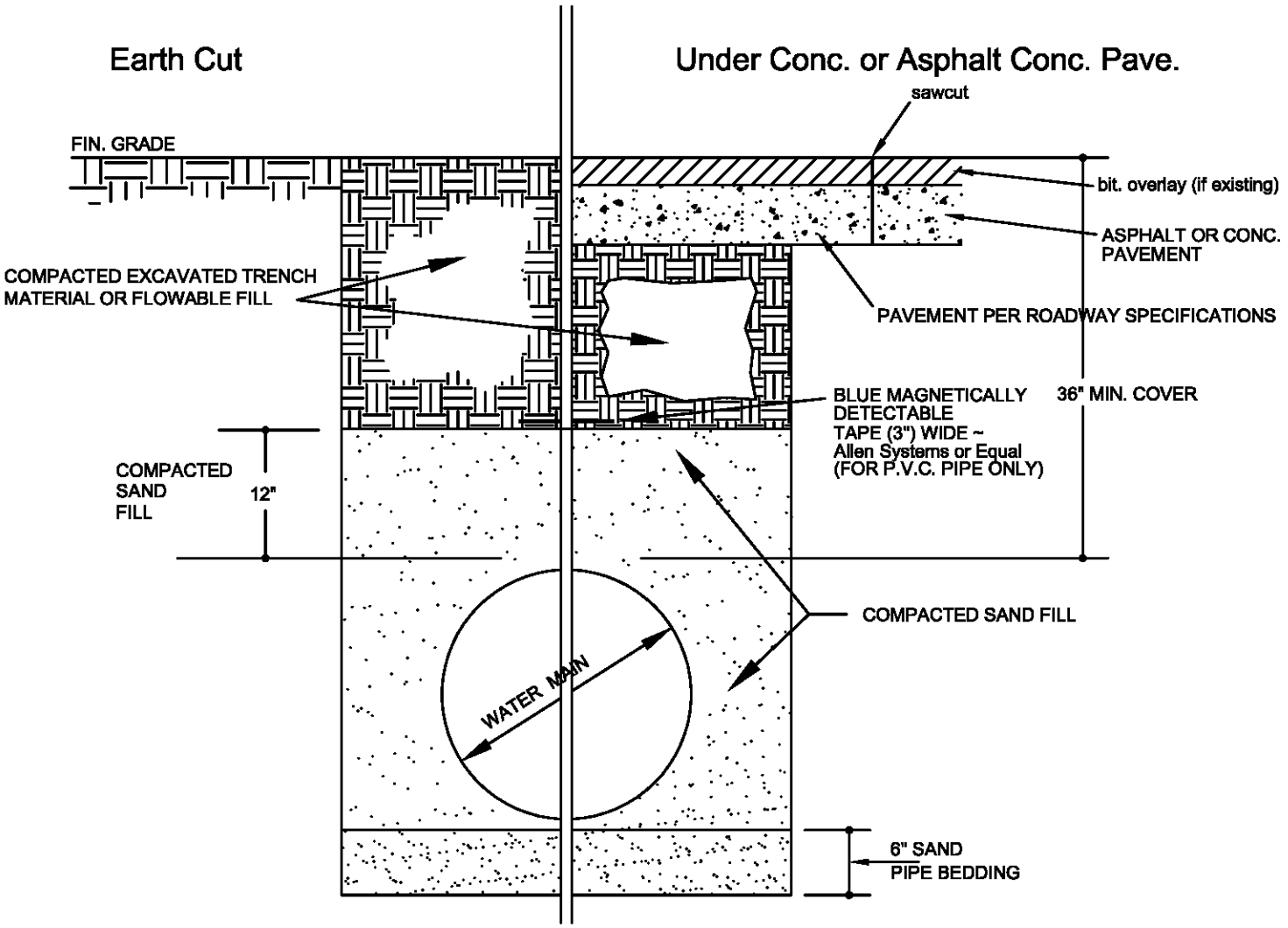
BOONE COUNTY WATER DISTRICT

WATER MAIN DETAILS

STANDARD DRAWINGS

Backfill of all trenches will be compacted by the Standard Proctor Methods, ASTM D 698

All areas will require compaction to 95% of maximum density or to the satisfaction of the Geo-Technical Engineer.



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KYTC SPEC.

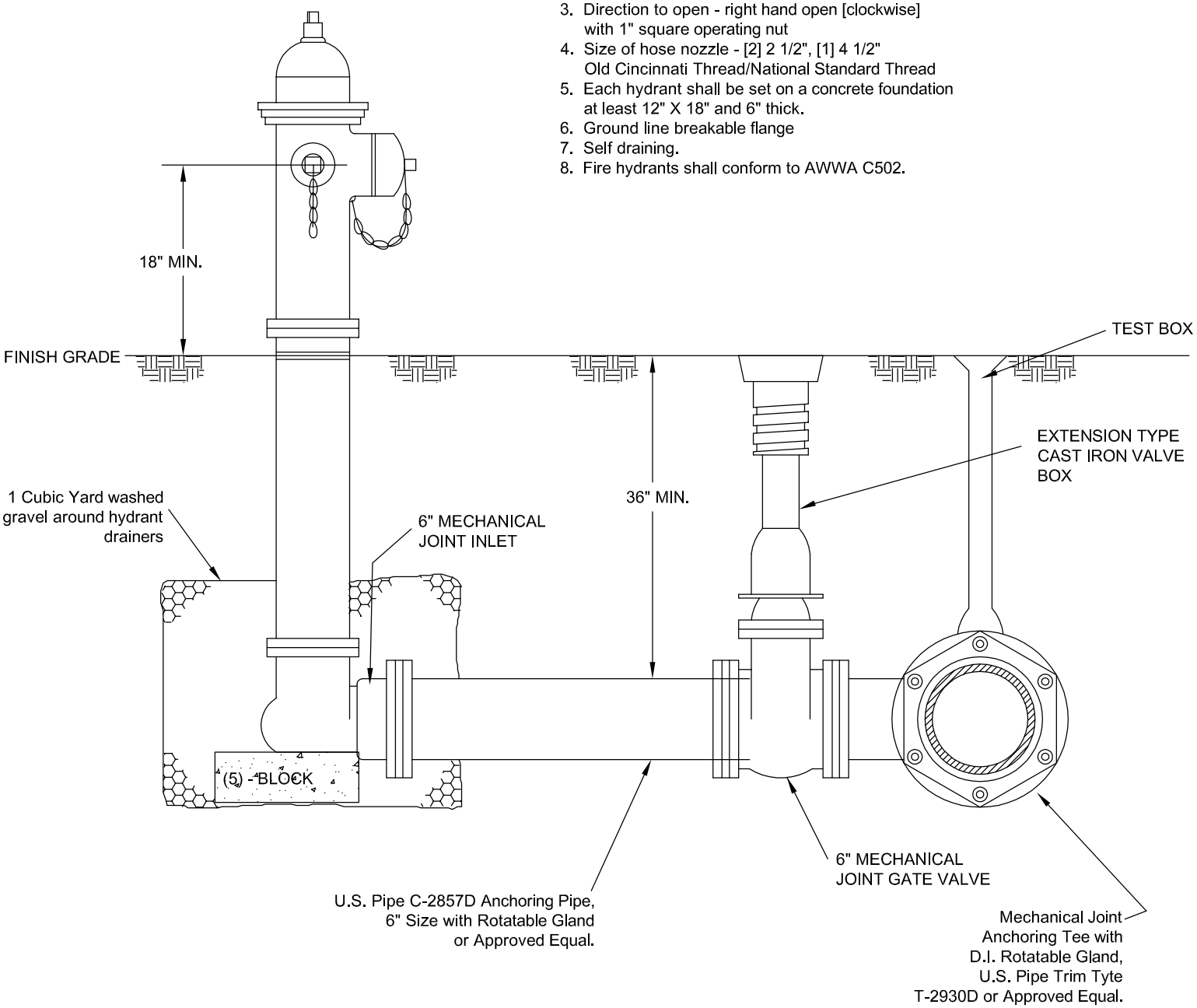
WATER MAIN TRENCH DETAIL

BCWD

SCALE: N.T.S.

HYDRANT DATA

1. Kennedy, Mueller, M&H, American Flow Control or Clow.
2. Size of Hydrant, minimum 6 inch
3. Direction to open - right hand open [clockwise] with 1" square operating nut
4. Size of hose nozzle - [2] 2 1/2", [1] 4 1/2" Old Cincinnati Thread/National Standard Thread
5. Each hydrant shall be set on a concrete foundation at least 12" X 18" and 6" thick.
6. Ground line breakable flange
7. Self draining.
8. Fire hydrants shall conform to AWWA C502.



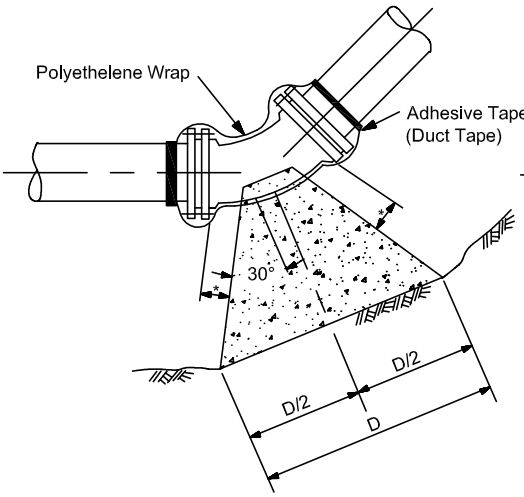
9/3/17

3

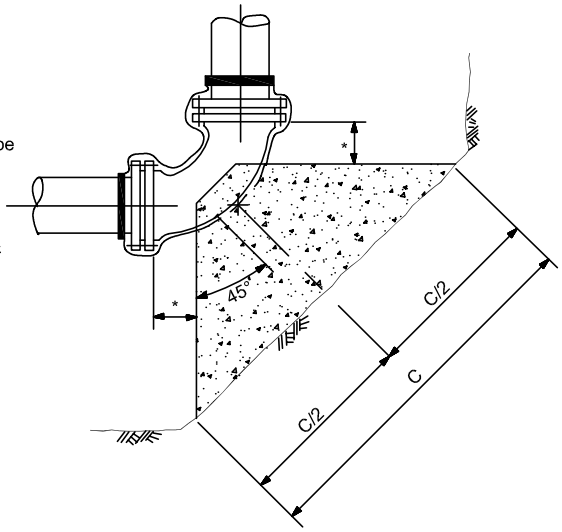
HYDRANT ASSEMBLY

BCWD

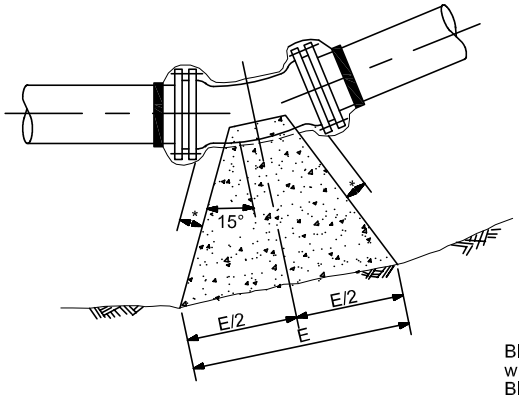
SCALE: N.T.S.



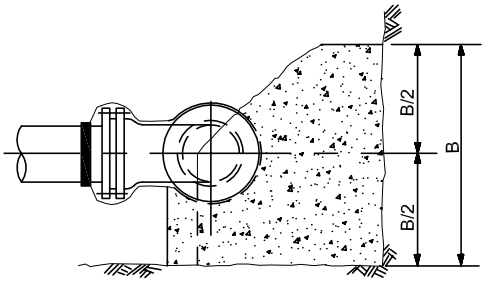
45° BEND



90° BEND



11 1/4° & 22 1/2° BEND



ELEVATION

Blocking shall be poured after polyethelene wrap is in place.
Blocking shall be inspected by the District prior to backfilling.

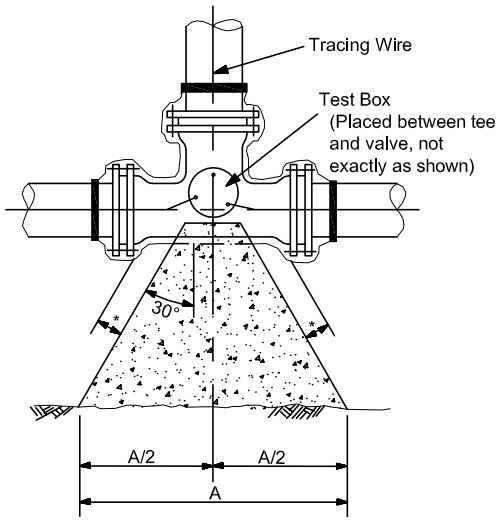
150 PSI/250 PSI

PIPE SIZE	A	B	C	D	E
6"	2'0"/2'6"	1'6"/1'6"	3'0"/3'6"	1'6"/2'0"	1'0"/1'0"
8"	2'6"/3'6"	2'0"/2'0"	3'6"/4'6"	2'0"/2'6"	1'0"/1'6"
10"	3'6"/4'0"	2'6"/2'6"	4'6"/5'6"	2'6"/3'0"	1'6"/1'6"
12"	4'0"/5'0"	3'0"/3'0"	5'6"/6'6"	3'0"/3'6"	1'6"/2'0"
16"	5'0"/6'0"	3'0"/4'0"	7'0"/8'6"	4'0"/4'6"	3'0"/3'0"
20"	6'0"/7'6"	5'0"/5'0"	7'0"/10'6"	4'0"/6'0"	3'0"/3'0"

* Distance to be 1/2" longer than entire length of the bolt used.

NOTES

1 PVC Fittings shall be per specifications.
2 Concrete to be 3500 psi.
3 All fittings to be Mechanical Joint.
4 Thrust blocks to be placed against undisturbed earth - use additional concrete as required for over excavation.
5 Blocking to be placed in a manner so that bolts can be removed without distrubing the block.



TEE (DEAD END OR FIRE HYDRANT SIMILAP

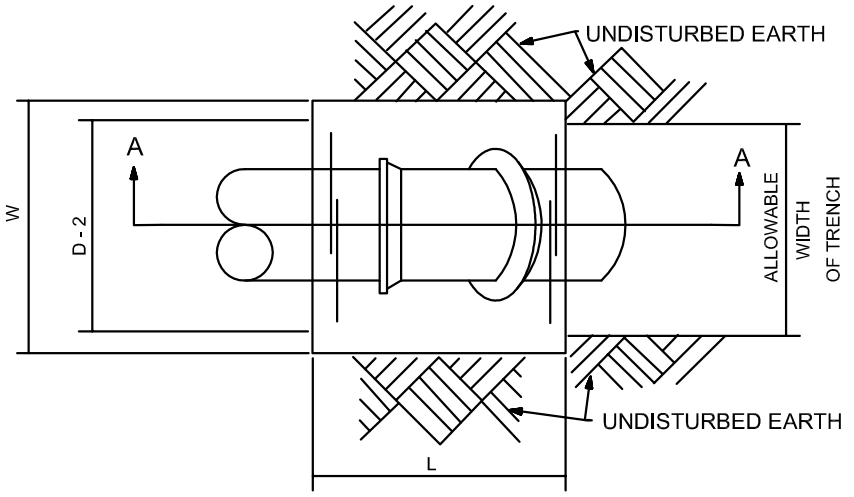
4/2/07

4

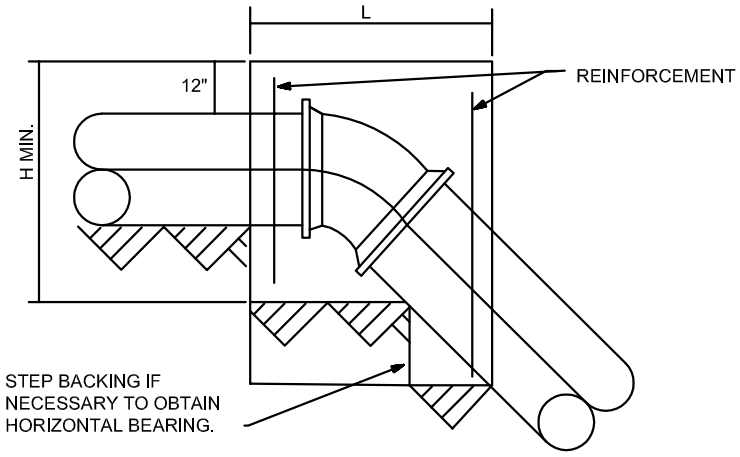
CONCRETE THRUST BLOCK

BCWD

SCALE: N.T.S.



PLAN



SECTION A-A

CONCRETE BACKING FOR VERTICAL BENDS

1. BACKING DESIGNED FOR 3000 POUNDS PER SQUARE FOOT SOIL BEARING AND 150 POUNDS PER SQUARE INCH INTERNAL PRESSURE.
2. PROVIDE MINIMUM CONCRETE REINFORCEMENT OF 2 PAIR OF TWO 5" "U" BARS @ 12" C.
3. CENTER BACKING ON BEND.

NO BLOCKING REQUIRED FOR VERTICAL "UP" BENDS

SIZE of PIPE	DEGREE OF BEND											
	11 1/4				22 1/2				45			
	L"	W"	H"	VOL.	L"	W"	H"	VOL.	L"	W"	H"	VOL.
4"	12	24	16	2.7	15	30	18	4.7	22	36	24	11.0
6"	12	43	18	5.4	16	48	34	15.1	30	55	24	22.9
8"	12	54	24	9.0	18	57	36	21.4	36	57	33	39.2
12"	20	63	36	26.3	37	62	37	49.2	48	62	51	88.0
16"	31	65	38	44.4	60	65	39	88.2	65	65	65	159.2
20"	45	70	40	73.0	56	70	60	136.4	72	76	78	247.5
24"	47	72	54	106.0	67	74	69	198.4	88	84	84	360.1

NOTE: VOLUMES GIVEN IN CUBIC FEET

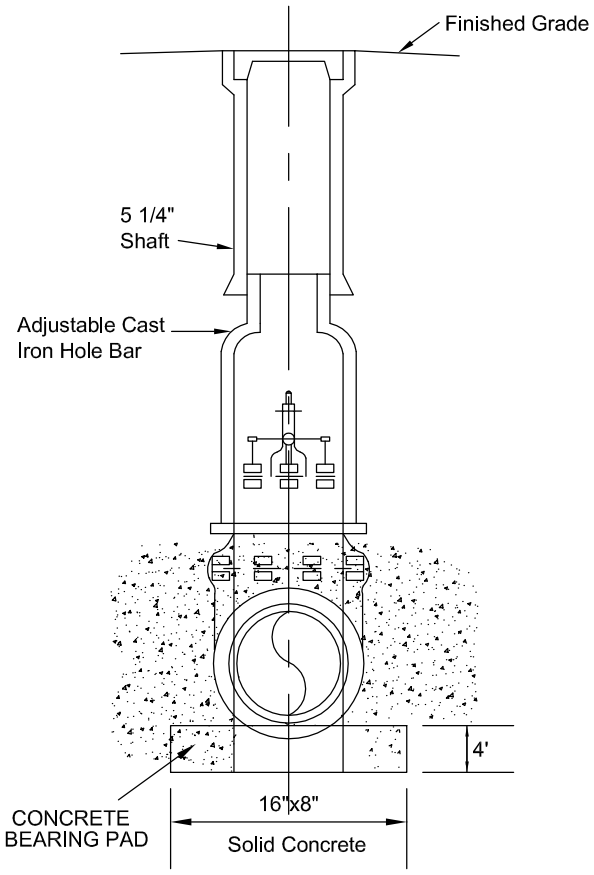
BLOCKING FOR SIZES NOT SHOWN SHALL USE THE NEXT LARGER SIZE.

5

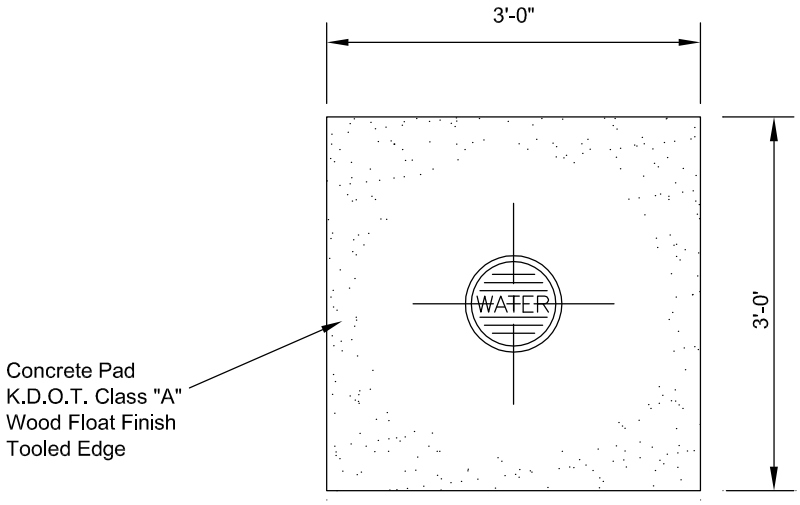
CONCRETE THRUST BLOCK DETAIL FOR VERTICAL "DOWN" BENDS

BCWD

SCALE: N.T.S.

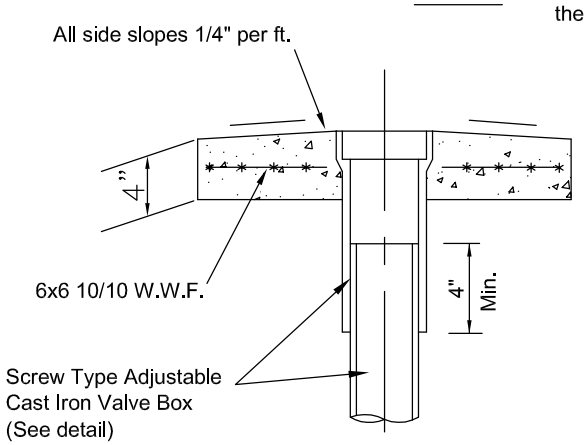


DETAIL VALVE BOX
INSTALLATION



PLAN

2'0" Concrete Pad may be used in urban arces as approved by the District.



ELEVATION

NOTES:

Concrete Pads shall be constructed around all main line valves except within hard paved areas.

Concrete Pads shall be constructed around customer service line valve ---- 3" and larger valves.

***TRACER WIRE SHALL NOT BE RUN UP THROUGH VALVE BOXES. ONLY IN TEST BOXES

9/3/17

6

VALVE BOX AND VALVE PAD

BCWD

SCALE: N.T.S.

Boone County Water District Self Centering Alignment Ring Specification

Each valve box shall have a two piece AFC Centering Ring that centers the valve box directly in a vertical position. The Centering Ring must have an adjustable detented slide to compensate for multiple stem diameters. The installation of the alignment ring below the operating nut should not disturb the function of the operating nut nor should the operating nut have to be removed to install the Centering Ring. Alternate centering devices other than that listed above must have the approval of the Boone County Water District.

4/2/07

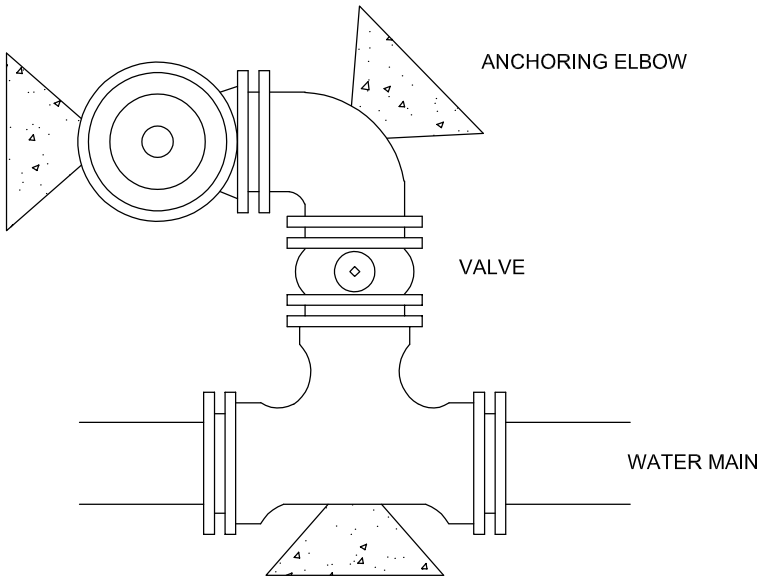
7

CENTER RING NOTE

BCWD

SCALE: N.T.S.

HYDRANT POINTS UP GRADE
(FOR PROPER AIR RELEASE)



SPECS SAME AS FIRE HYDRANT ASSEMBLY
(STD. DRWG. NO. 109)

4/2/07

8

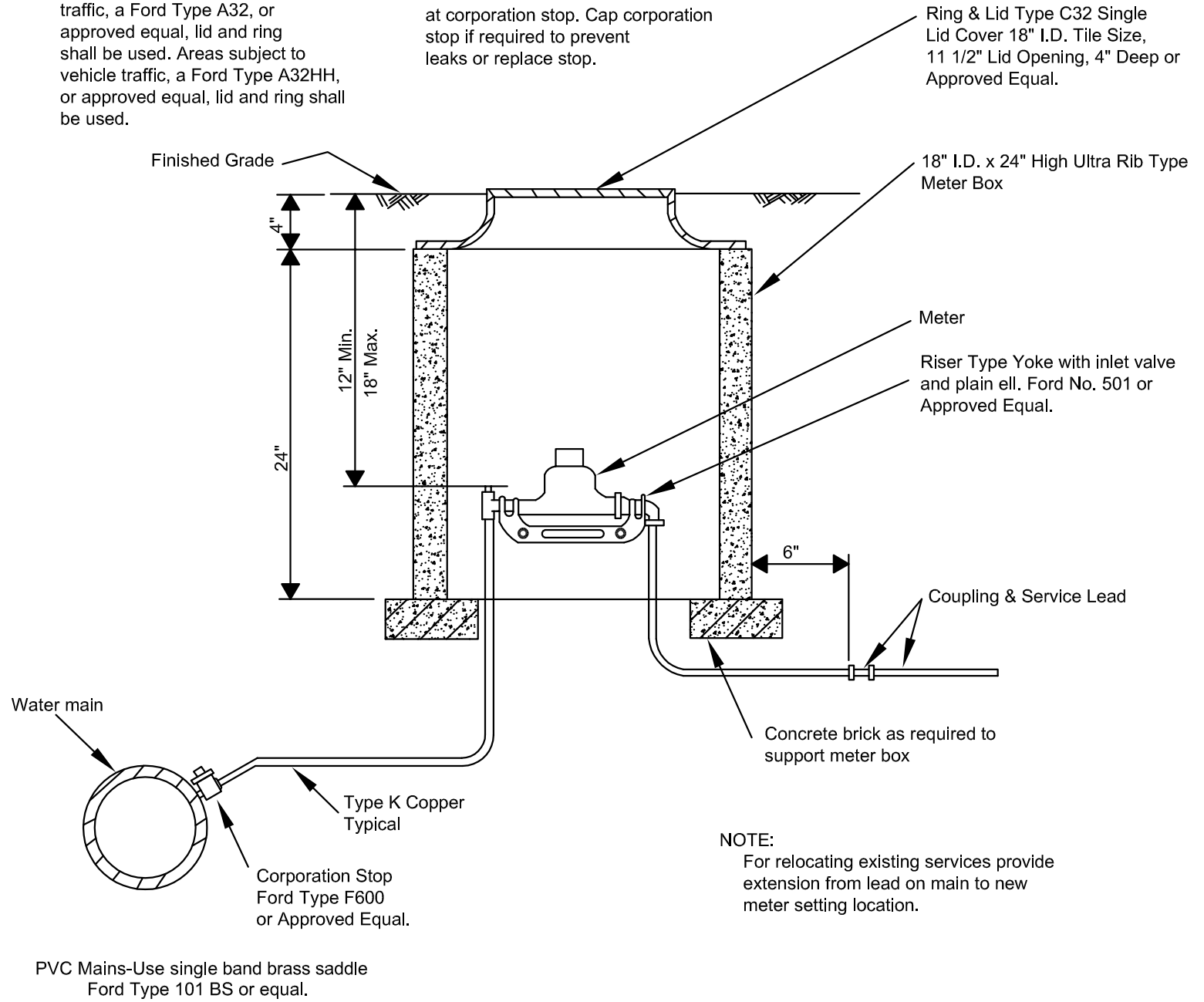
FIRE HYDRANT ASSEMBLY WITH 90° BEND

BCWD

SCALE: N.T.S.

NOTE:
Services installed in concrete areas, not subject to vehicle traffic, a Ford Type A32, or approved equal, lid and ring shall be used. Areas subject to vehicle traffic, a Ford Type A32HH, or approved equal, lid and ring shall be used.

NOTE:
Services to be removed & abandoned are to be disconnected at corporation stop. Cap corporation stop if required to prevent leaks or replace stop.



NOTE:
For relocating existing services provide extension from lead on main to new meter setting location.

PVC Mains-Use single band brass saddle Ford Type 101 BS or equal.

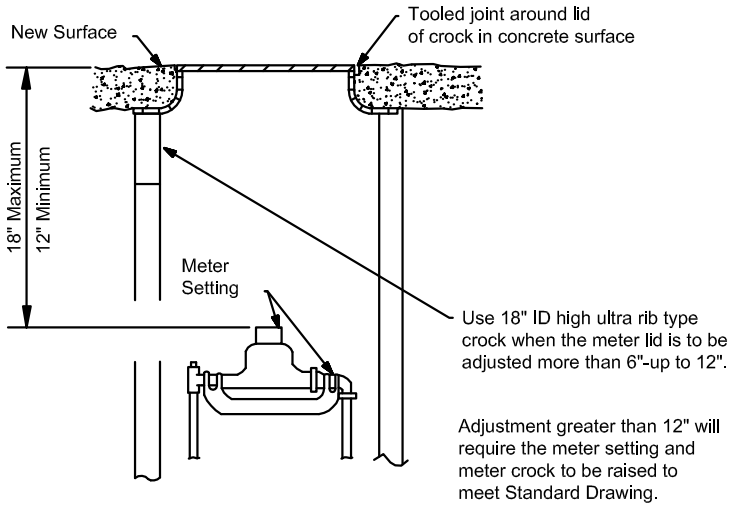
4/2/07

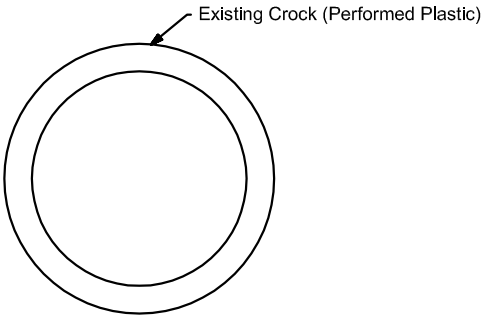
9

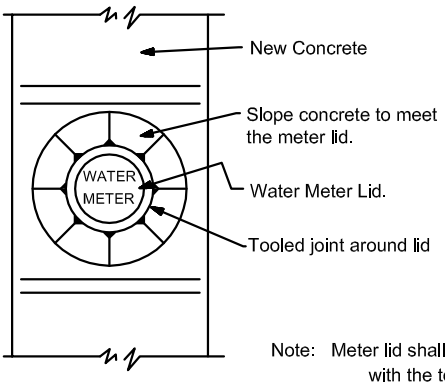
5/8" & 1" METER SETTING

BCWD

SCALE: N.T.S.







Note: Meter lid shall be flush with the top of the concrete surface. The concrete surface shall be tapered to provide a smooth transition to the meter lid. A tooled joint shall be formed around the meter lid.

NOTE: SERVICES INSTALLED IN CONCRETE AREAS, NOT SUBJECT TO VEHICLE TRAFFIC, A FORD TYPE A32, OR APPROVED EQUAL, LID AND RING SHALL BE USED. AREAS SUBJECT TO VEHICLE TRAFFIC, A FORD TYPE A32HH, OR APPROVED EQUAL, LID AND RING SHALL BE USED.

PLASTIC (PVC) METER CROCKS shall be raised by use of an adapter with a section of plastic crock cut to achieve final grade.

At no time shall wood be used to adjust the ring and lid to grade.

Meter ring and lids shall be reset solidly and shall have no broken edge to allow dirt to enter the crock.

If the meter box is damaged beyond repair it shall be replaced. See Meter Setting detail.

RAISING CURB STOPS OR VALVE BOXES:

Curb stop boxes and valve boxes shall be raised by turning the upper section to meet grade. If the upper section cannot be raised in this manner it shall be carefully broken off and replaced.

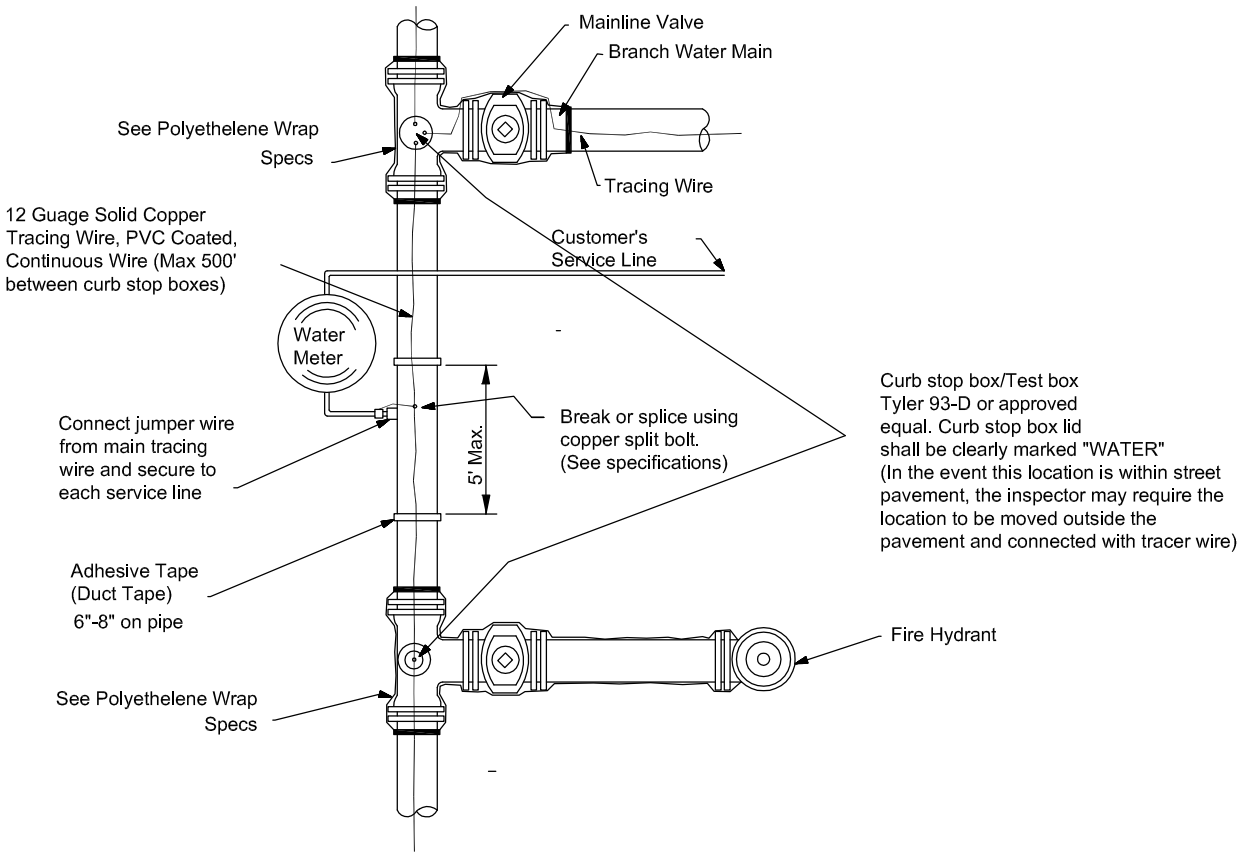
New upper sections shall be supplied by Contractor.

10

ADJUSTING RING & LID TO GRADE

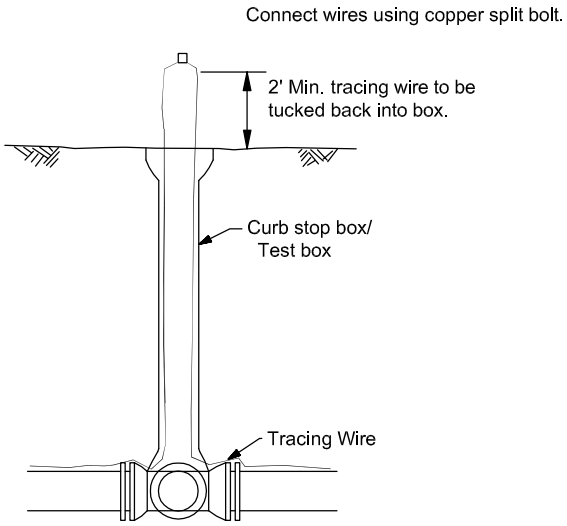
BCWD

SCALE: N.T.S.



TRACER WIRE TO BE INSTALLED ON ALL WM INCLUDING PVC AND DUCTILE IRON

Note: Curb stop box/test box shall not be installed in paved areas unless approved by the District.

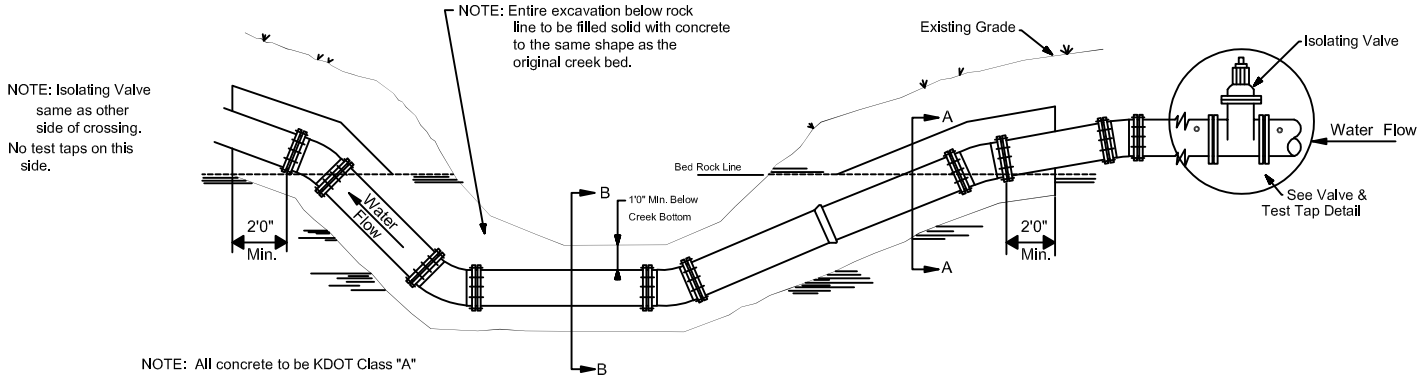


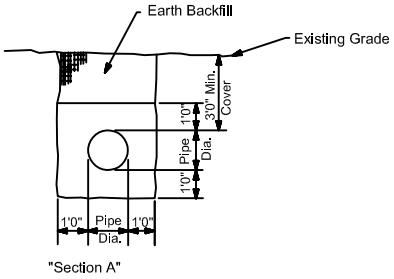
9/3/17

11

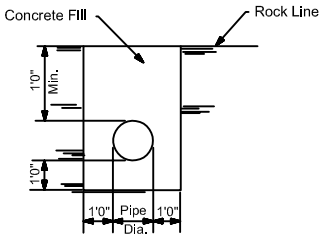
TRACING WIRE

BCWD -This shall be included and incidental to Water Main Construction- SCALE: N.T.S.

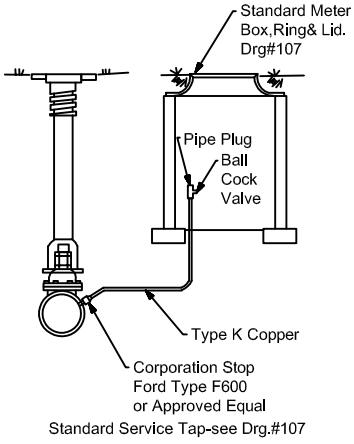


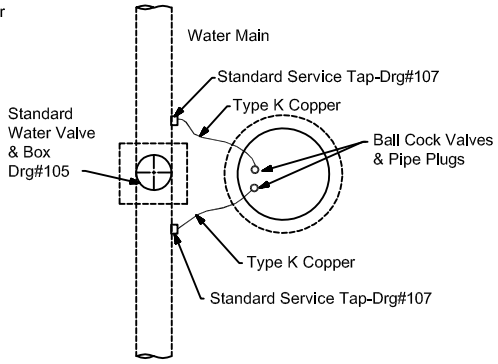


"Section A"



"Section B"





VALVE & TEST TAP DETAIL

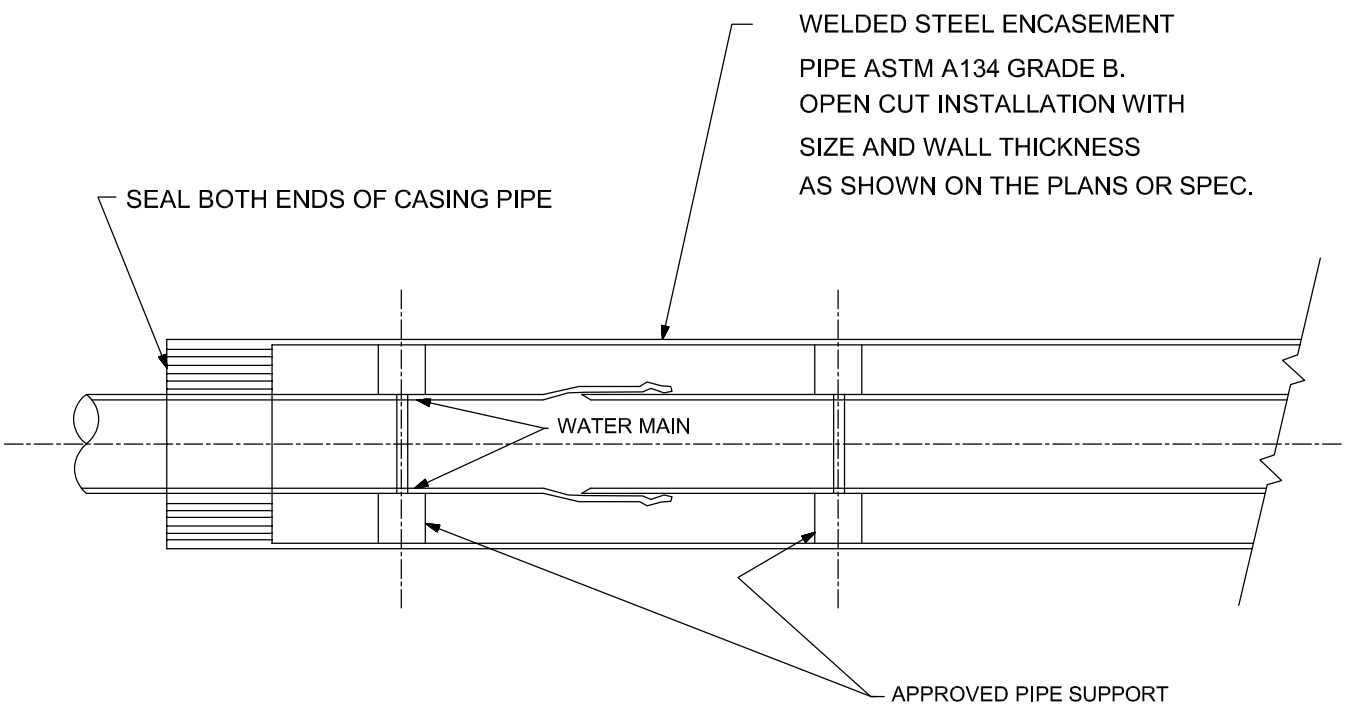
Valve shall be installed in areas not subject to flooding
No services will be tapped between the isolating valve on the creek crossings.

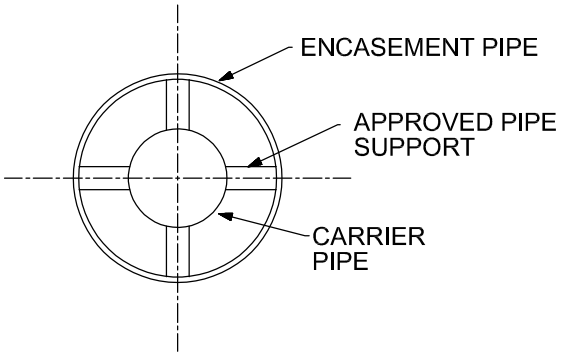
4/2/07

12 CONCRETE ENCASEMENT AT CREEK CROSSING

BCWD

SCALE: N.T.S.





NOTE: CASING PIPE JOINTS SHALL BE SEAM WELDED SO THAT CASING IS WATER TIGHT FROM END TO END.

4/2/07

13

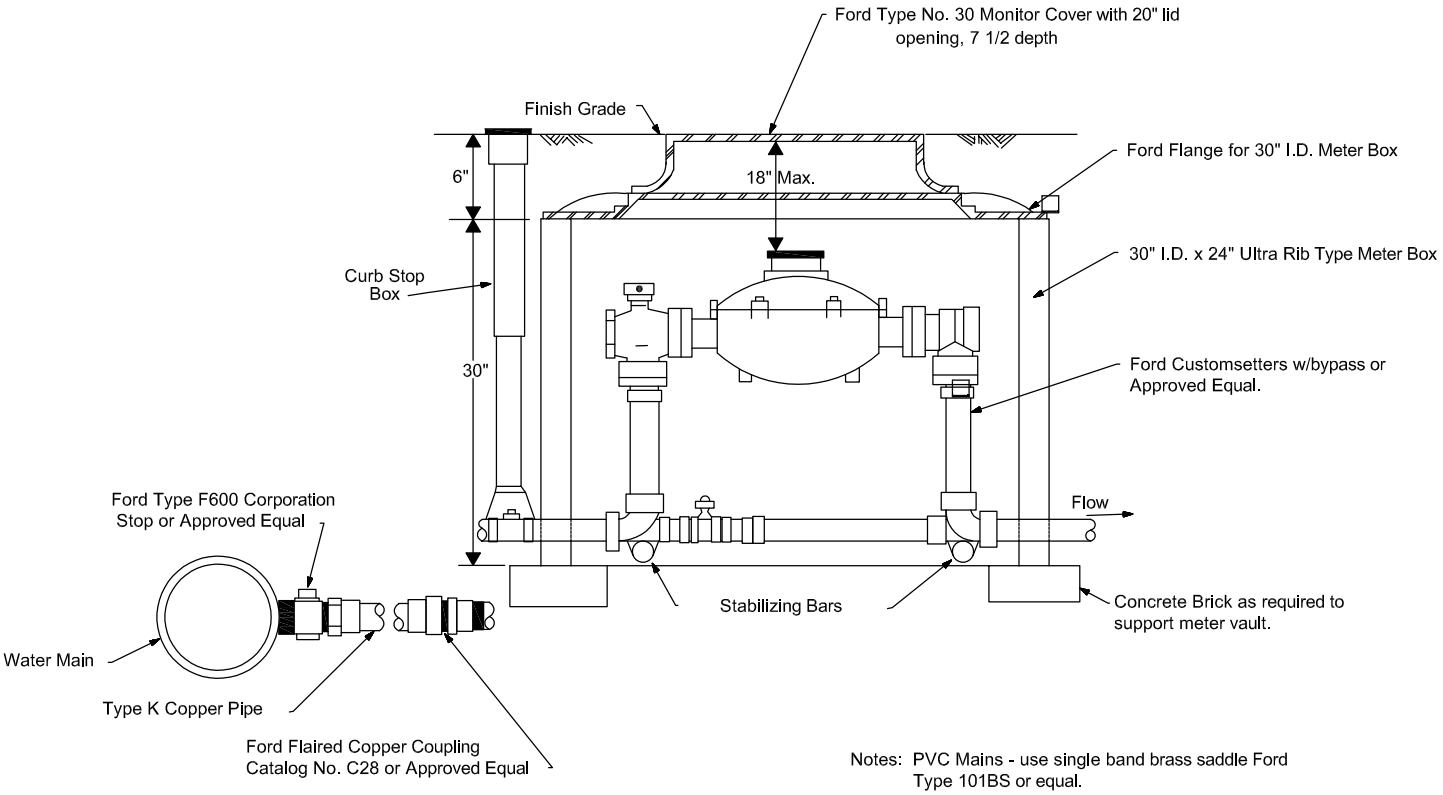
STEEL ENCASEMENT PIPE DETAIL

BCWD

SCALE: N.T.S.

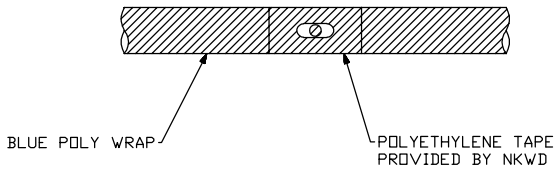
Note: Services to be removed & abandoned are to be disconnected at corporation stop. Cap corporation stop if required to prevent leaks or replace stop. For relocating existing services provide extension from lead on main to new meter setting location.

Note: If service is installed in sidewalk or pavement area,a heavy duty lid shall be installed.



Notes: PVC Mains - use single band brass saddle Ford Type 101BS or equal.
D.I.P. Mains 8" or smaller use a double strap brass tapping saddle Ford Type 202B or equal.

ONLY FOR D.I. PIPE



4/27/18

14 METER SETTING- 2"

BCWD

SCALE: N.T.S.

Fusible PVC®

Underground Solutions, Inc.
13135 Danielson Street, Suite 201
Poway, CA 92064
Phone: (858) 679-9551

Pipe Engineering Data Sheet

Nom. Size (in)	DR / Pipe Stiffness	O. D. Series	Material	O.D. (in)[1]	Min. Wall (in)[1]	Avg. I.D. (in)	Wt (lbs/ft)[4]	Safe Pulling Force (lbs)[3]	Max. Working Pressure (psig)[5]	Critical Buckling Pressure (psig)[6]	Min. Allowable Bend Radius (ft)[7]
4	DR 14	DIPS	Fusible C-900®	4.80	0.34	4.07	3.11	13,400	305	426	100
4	DR 18	DIPS	Fusible C-900®	4.80	0.27	4.23	2.46	10,600	235	191	100
6	SDR 17	IPS	FPVC®	6.63	0.39	5.80	4.95	21,300	250	229	138
6	SDR 21	IPS	FPVC®	6.63	0.32	5.96	4.06	17,500	200	117	138
6	SDR 26	IPS	FPVC®	6.63	0.26	6.08	3.31	14,200	160	60	138
6	DR 14	DIPS	Fusible C-900®	6.90	0.49	5.85	6.42	27,700	305	426	144
6	DR 18	DIPS	Fusible C-900®	6.90	0.38	6.09	5.08	21,900	235	190	144
6	DR 25	DIPS	Fusible C-900®	6.90	0.28	6.31	3.73	16,000	165	68	144
8	SDR 17	IPS	FPVC®	8.63	0.51	7.55	8.39	36,200	250	229	180
8	SDR 21	IPS	FPVC®	8.63	0.41	7.76	6.86	29,600	200	116	180
8	SDR 26	IPS	FPVC®	8.63	0.33	7.92	5.61	24,200	160	60	180
8	DR 14	DIPS	Fusible C-900®	9.05	0.65	7.68	11.04	47,700	305	425	189
8	DR 18	DIPS	Fusible C-900®	9.05	0.50	7.98	8.75	37,800	235	191	189
8	DR 25	DIPS	Fusible C-900®	9.05	0.36	8.28	6.41	27,600	165	68	189
10	SDR 21	IPS	FPVC®	10.75	0.51	9.67	10.65	46,000	200	116	224
10	SDR 26	IPS	FPVC®	10.75	0.41	9.87	8.71	37,500	160	60	224
10	DR 14	DIPS	Fusible C-900®	11.10	0.79	9.42	16.62	71,800	305	426	231
10	DR 18	DIPS	Fusible C-900®	11.10	0.62	9.79	13.17	56,800	235	191	231
10	DR 25	DIPS	Fusible C-900®	11.10	0.44	10.16	9.64	41,600	165	68	231
12	SDR 17	IPS	FPVC®	12.75	0.75	11.16	18.64	79,100	250	228	266
12	SDR 21	IPS	FPVC®	12.75	0.61	11.47	14.99	64,700	200	116	266
12	SDR 26	IPS	FPVC®	12.75	0.49	11.71	12.25	52,800	160	60	266
12	DR 14	DIPS	Fusible C-900®	13.20	0.94	11.20	23.50	101,600	305	426	275
12	DR 18	DIPS	Fusible C-900®	13.20	0.73	11.65	18.60	80,300	235	190	275
12	DR 25	DIPS	Fusible C-900®	13.20	0.53	12.08	13.63	58,800	165	68	275
14	DR 14	DIPS	Fusible C-905®	15.30	1.09	12.98	31.57	136,500	305	426	319
14	DR 18	DIPS	Fusible C-905®	15.30	0.85	13.50	25.00	108,000	235	190	319
14	DR 21	DIPS	Fusible C-905®	15.30	0.73	13.75	21.64	93,400	200	117	319
14	DR 25	DIPS	Fusible C-905®	15.30	0.61	14.00	18.31	79,000	165	68	319
16	DR 14	DIPS	Fusible C-905®	17.40	1.24	14.76	41.47	176,600	305	426	363
16	DR 18	DIPS	Fusible C-905®	17.40	0.97	15.35	32.35	139,700	235	191	363
16	DR 21	DIPS	Fusible C-905®	17.40	0.83	15.64	27.99	120,800	200	117	363
16	DR 25	DIPS	Fusible C-905®	17.40	0.70	15.92	23.70	102,200	165	68	363
18	DR 18	DIPS	Fusible C-905®	19.50	1.08	17.20	40.60	175,400	235	190	406
18	DR 21	DIPS	Fusible C-905®	19.50	0.93	17.53	35.13	151,700	200	117	406
18	DR 25	DIPS	Fusible C-905®	19.50	0.78	17.85	29.76	128,400	165	68	406
20	DR 14	DIPS	Fusible C-905®	21.60	1.54	18.33	62.93	272,200	305	426	450
20	DR 18	DIPS	Fusible C-905®	21.60	1.20	19.06	49.83	215,300	235	190	450
20	DR 21	DIPS	Fusible C-905®	21.60	1.03	19.42	43.10	186,100	200	117	450
20	DR 25	DIPS	Fusible C-905®	21.60	0.86	19.77	36.51	157,500	165	68	450

5. Other methods of sterilization may be used; however, prior approval of the General Manager of Florence Water and Sewer Commission in writing must be obtained prior to the test being performed.

E. BACTERIA TEST:

1. After flushing has been completed and the chlorine residual is not greater than 1.2 ppm, a bacteriological sample shall be taken in accordance with the Kentucky Department of Environmental Protection Agency, Safe Drinking Water Act.

2. The mouth of the valve, hydrant, blow-off, etc. shall be sterilized using a propane torch or equivalent and then allowed to flow for a period of not less than 5 minutes.

3. The standard sample shall be collected in sterile bottles, by the representative of the certified laboratory, care being taken not to contaminate the neck of the bottle or stopper during collection.

4. This sample will then be delivered to certified laboratory by the individual collecting the sample.

5. Copies of the analysis shall be sent to the Florence Water and Sewer Commission inspector directly from the laboratories.

6. In the event that the laboratory analysis shows bacteria present, the line shall be re-chlorinated, sterilized, flushed, and a new sample taken until such time that the line meets the Safe Drinking Water Act Standards.

7. Prior to any public water supply system being accepted by the City of Florence, all of the requirements contained herein shall have been satisfied.

F. WATER METER PITS: When and if required and/or necessary, all meter pits shall be approved by the City.

G. WATER LINE AND SEWER LINE SEPARATION: Water and Sewer mains normally will be separated a distance of at least ten feet (10’) horizontally. If such lateral separation is not possible, the pipes shall be in separate trenches with the sewer at least eighteen inches (18”) below the bottom of the water main; or such other separation as approved by the City of Florence shall be made. In general, the vertical separation at a crossing of water and sewer lines shall be at least eighteen (18”). Where this is not possible, the sewer shall be constructed of cast iron pipe using mechanical

or slip-on joints, a distance of at least ten feet (10') on either side of the crossing or other suitable protection shall be provided, such as concrete encasement of the sanitary sewer for ten feet (10') either side of the water pipe. This encasement is to be six inches (6") thick.

1.10 MEASUREMENT – PAYMENT

A. MEASUREMENT: The length of water lines to be paid for will be determined by the measurement along the center line of the various sizes and types of pipe furnished and installed from connection at tap to existing water lines to center of pipe as measured along the center of the main. No deduction will be made for the space occupied by valve and fittings.

B. PAYMENT:

1. General: Payment shall include the furnishing of all testing, sterilization, plant, labor, materials, and incidentals, necessary to complete the work specified and as shown on the plans.

2. Water Line: Payment will be made for the water line at the contract unit price per linear foot for the various sizes of water line as listed in the Schedule of Unit Prices, which prices shall be full compensation for all pipe, joints, specials, and fittings complete in place, unless specifically requested on bid sheet.

3. Installed by Boring: Pipe installed under pavement by boring shall be paid for on unit prices as specified in the Schedule of Unit Prices and length under pavement.

4. Valves: Payment for gate valves and boxes or chambers will be made at the respective contract unit price, each as listed in the Schedule of Unit Prices for each such item complete in place.

5. Tapping Sleeve, Valve, and Valve Boxes: Tapping sleeve, valve and valve boxes will be paid for at the contract specified unit price which shall be due compensation for all plant, labor, material, and equipment necessary for the installation of same.

6. Air Release Valve: Air release valves will be paid for at the contract specified unit price installed in place as per applicable drawings.

7. Fire Hydrant Assembly: This item to be paid for at the contract unit price which shall be full compensation for furnishing the 8 inch connection to the main line, one 8" ductile anchoring coupling, one 6" ductile anchoring pipe, one 8" – 6" ductile reducer, 8 inch resilient gate valve and valve box and fire hydrant completely

installed as per plans and specifications. Tees will not be included but will be paid at the contract specified unit price.

8. Pipe Clamps and Sleeves: These items are not pay items as they are to be furnished by the owner and installed by the Bridge Contractor, except that the Contractor will connect clamps into the inserts at the time of inserting the pipe.

9. Insulation: This item is not a pay item and shall be included in the unit price for 12 inch ductile iron pipe.

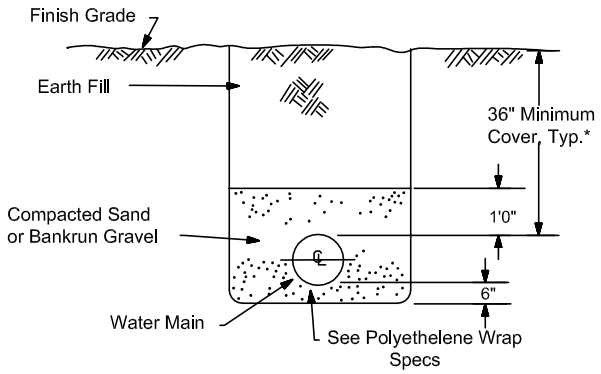
+ + END OF SECTION + +

CITY OF FLORENCE
PUBLIC SERVICES - WATER DIVISION

STANDARD DRAWINGS

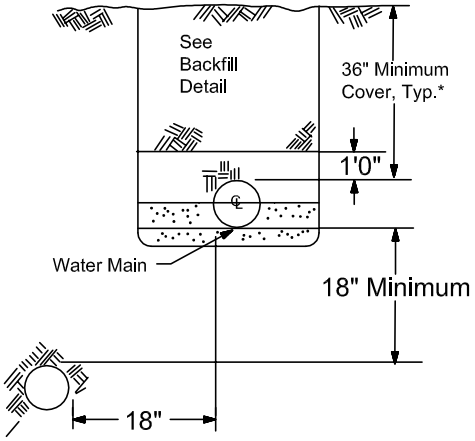
www.florence-ky.gov

SUBDIVISION CONSTRUCTION



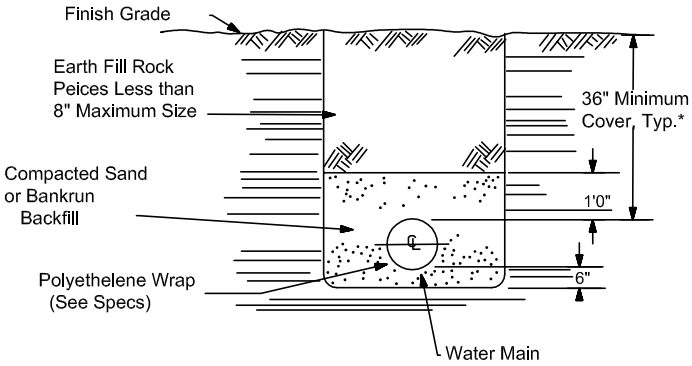
EARTH CUTS TRENCH DETAIL

ALTERNATE TO BE USED ONLY ON APPROVAL BY THE CITY



Water Main must be located a minimum of 10 feet lateral distance from anyexisting or future sewer lines or manholes, or as shown in the above alternate.

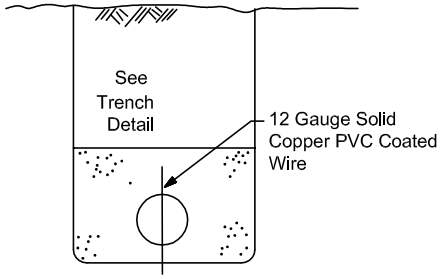
WATER MAIN PARALLELING SEWER MAIN



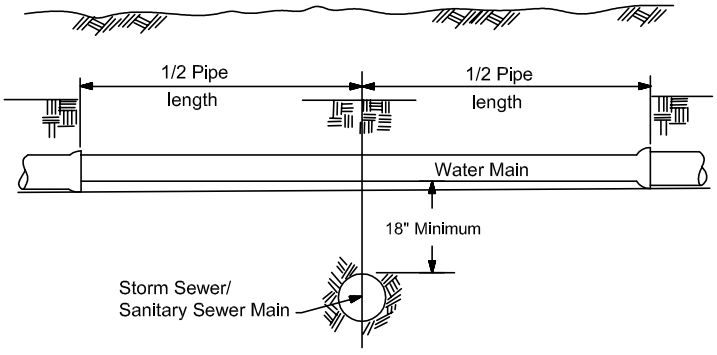
ROCK CUTS & UNSTABLE SUBGRADE

* 48" Maximum Cover

TRENCH DETAIL



PVC PIPE



WATER MAIN CROSSING SEWER

TYPICAL PIPELINE TRENCH DETAIL

N.T.S.

REVISION	BY	DATE

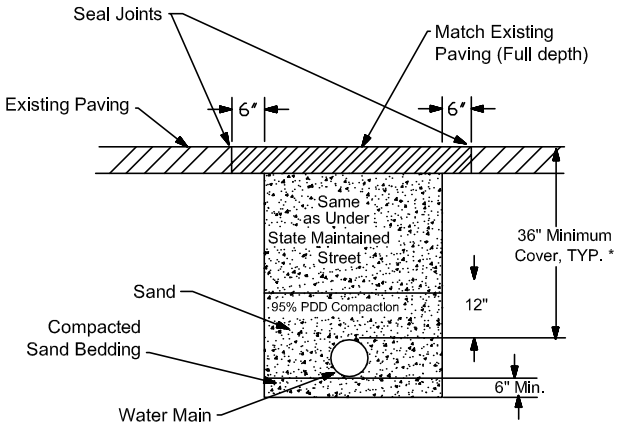
CITY OF FLORENCE KENTUCKY®

CITY OF FLORENCE
8100 EWING BLVD.
FLORENCE, KENTUCKY 41042
Ph: (859) 647-5416
Fax: (859) 647-5438

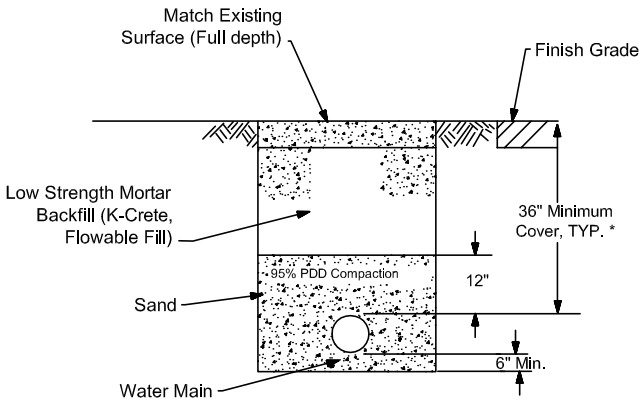
DATE: 2014

STANDARD DRAWING NO: 103

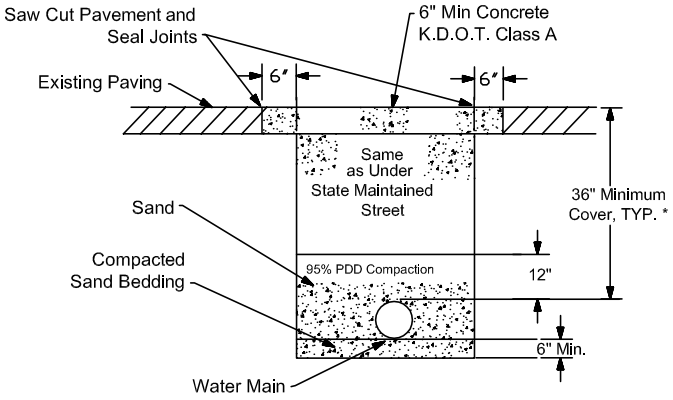
ALL CONSTRUCTION



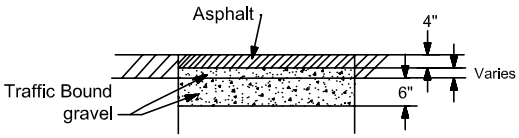
UNDER ASPHALT CONCRETE PAVEMENT



UNDER SHOULDER OF STATE MAINTAINED STREET

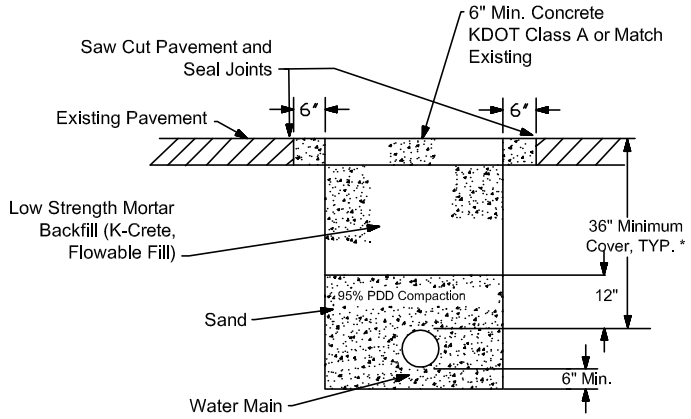


UNDER CONCRETE PAVEMENT



TEMPORARY STREET RESTORATION

PDD= Standard Proctor Dry Density
-ASTM D698



UNDER STATE MAINTAINED STREET

* 48" Maximum Cover

TYPICAL PIPELINE TRENCH DETAIL

N.T.S.

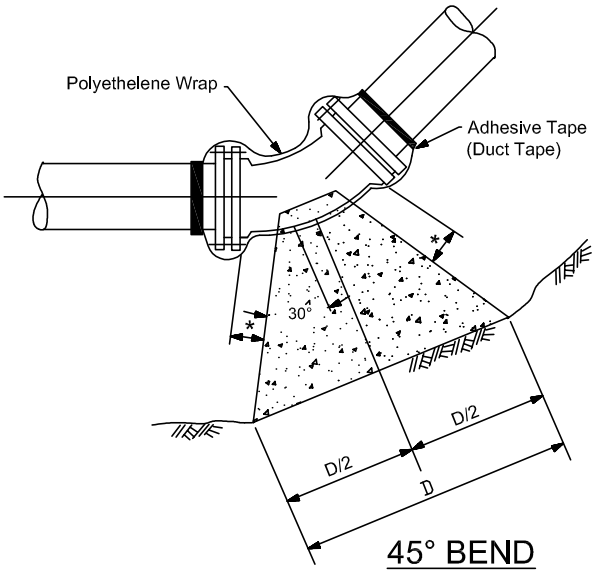
REVISION	BY	DATE

CITY OF FLORENCE KENTUCKY®

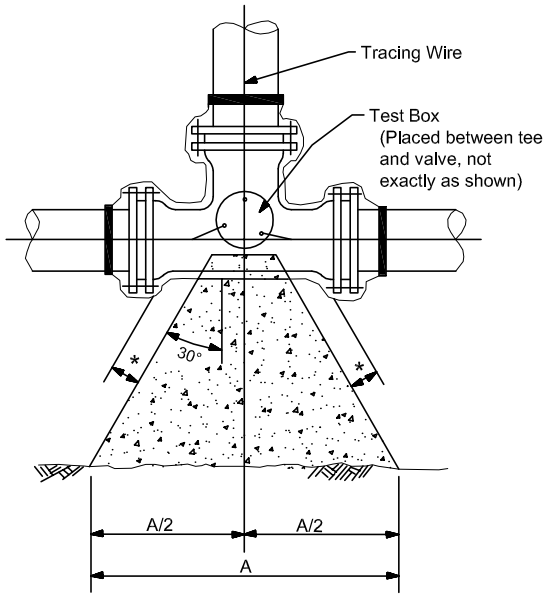
CITY OF FLORENCE
8100 EWING BLVD.
FLORENCE, KENTUCKY 41042
Ph: (859) 647-5416
Fax: (859) 647-5438

DATE: 2014

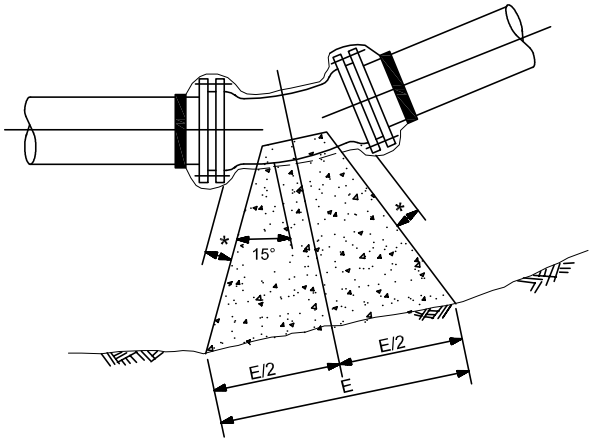
STANDARD DRAWING NO: 103-A



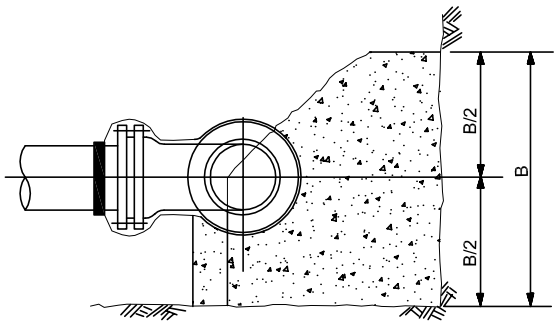
45° BEND



TEE (DEAD END OR FIRE HYDRANT SIMILAP



11 1/4° & 22 1/2° BEND



ELEVATION

Blocking shall be poured after polyethelene wrap is in place.
Blocking shall be inspected by the City prior to backfilling.

150 PSI/250 PSI

PIPE SIZE	A	B	C	D	E
6"	2'0"/2'6"	1'6"/1'6"	3'0"/3'6"	1'6"/2'0"	1'0"/1'0"
8"	2'6"/3'6"	2'0"/2'0"	3'6"/4'6"	2'0"/2'6"	1'0"/1'6"
10"	3'6"/4'0"	2'6"/2'6"	4'6"/5'6"	2'6"/3'0"	1'6"/1'6"
12"	4'0"/5'0"	3'0"/3'0"	5'6"/6'6"	3'0"/3'6"	1'6"/2'0"
16"	5'0"/6'0"	3'0"/4'0"	7'0"/8'6"	4'0"/4'6"	3'0"/3'0"
20"	6'0"/7'6"	5'0"/5'0"	7'0"/10'6"	4'0"/6'0"	3'0"/3'0"

* Distance to be 1/2" longer than entire length of the bolt used.

NOTES

1. DIP Fittings shall be per specifications.
2. Concrete to be 3500 psi.
3. All fittings to be Mechanical Joint.
4. Thrust blocks to be placed against undisturbed earth - use additional concrete as required for over excavation.
5. Blocking to be placed in a manner so that bolts can be removed without distrubing the block.
6. Second form of restraint for 45° required.

CONCRETE THRUST BLOCK DETAIL

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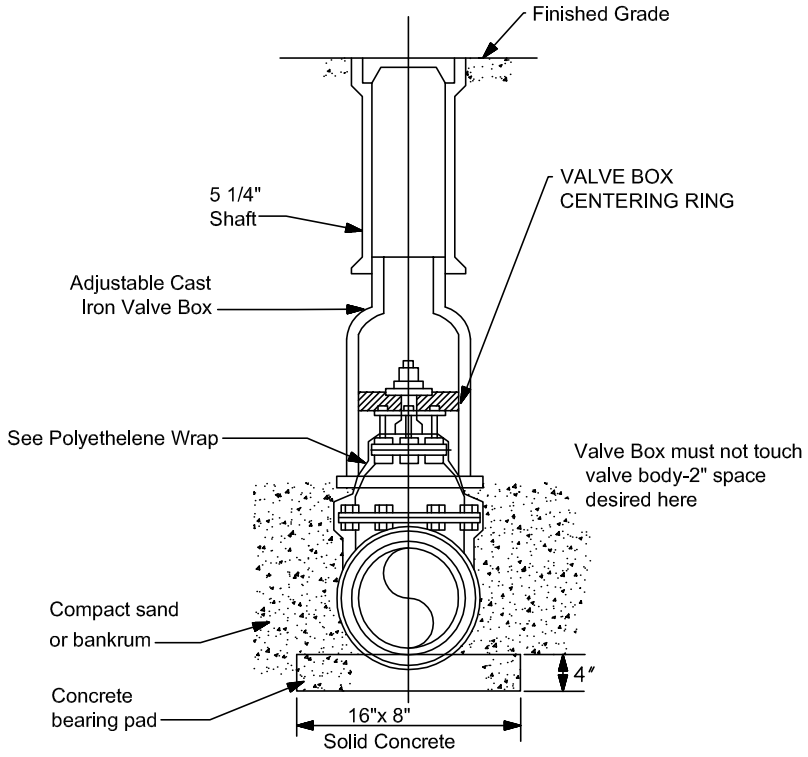
STANDARD DRAWING NO: 104

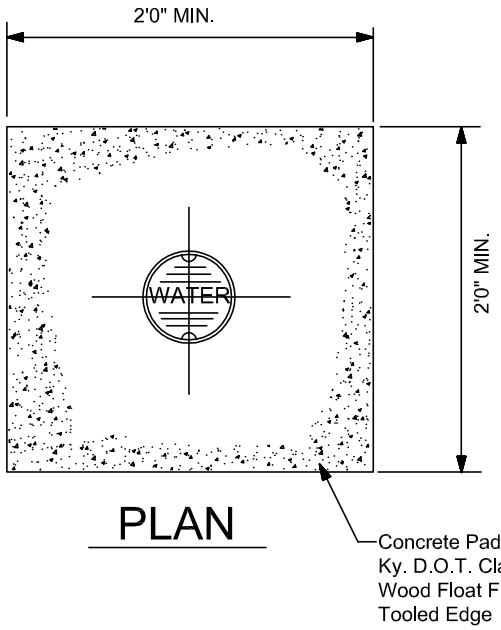


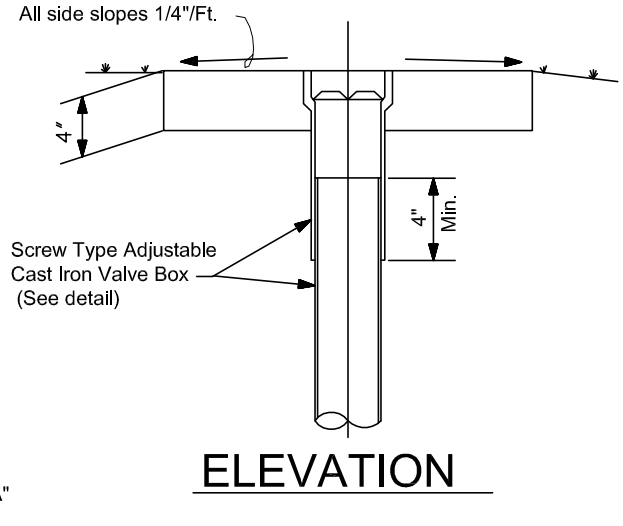
Detail Valve Box Installation

Note:Valve box shall not transmit shock or stress to the valve

NOTES

Concrete Pads shall be constructed around all main line valve boxes except within hard paved areas.
Concrete Pads shall be constructed around customer service line valve boxes 3" and larger valves.





VALVE BOX AND VALVE PAD DETAIL

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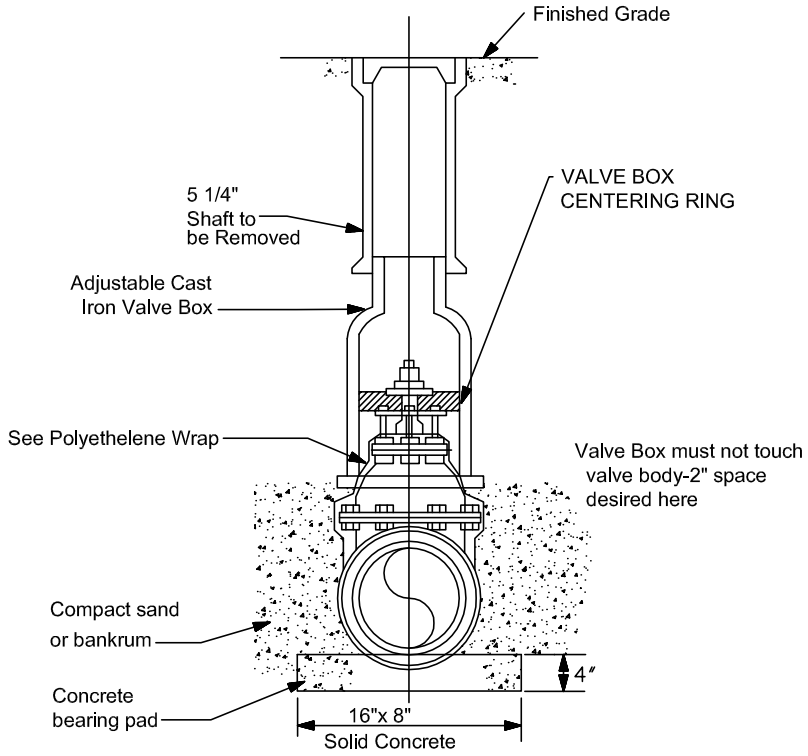
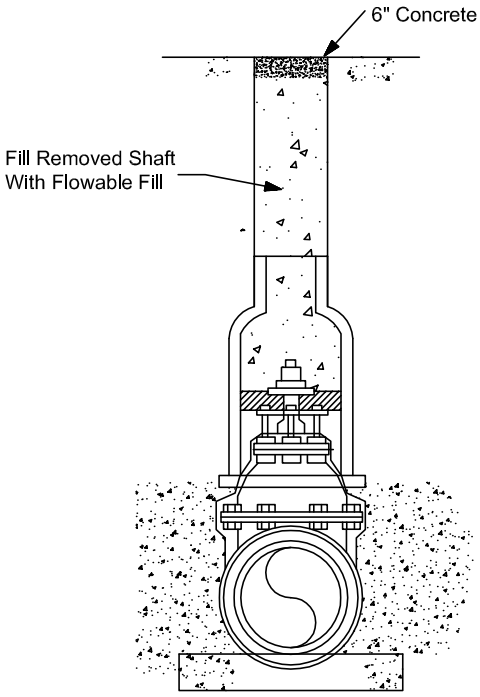


Existing Valve Box
Construction



NOTES

Flowable Fill to be Installed to Bottom of Existing Asphalt. Patch Remaining Void with Asphalt Prior to Resurfacing. Mill and Resurface Over These Areas During Milling and Resurfacing of Existing street.

Detail Valve Box
Abandonment

REMOVAL OF WATER VALVE BOX

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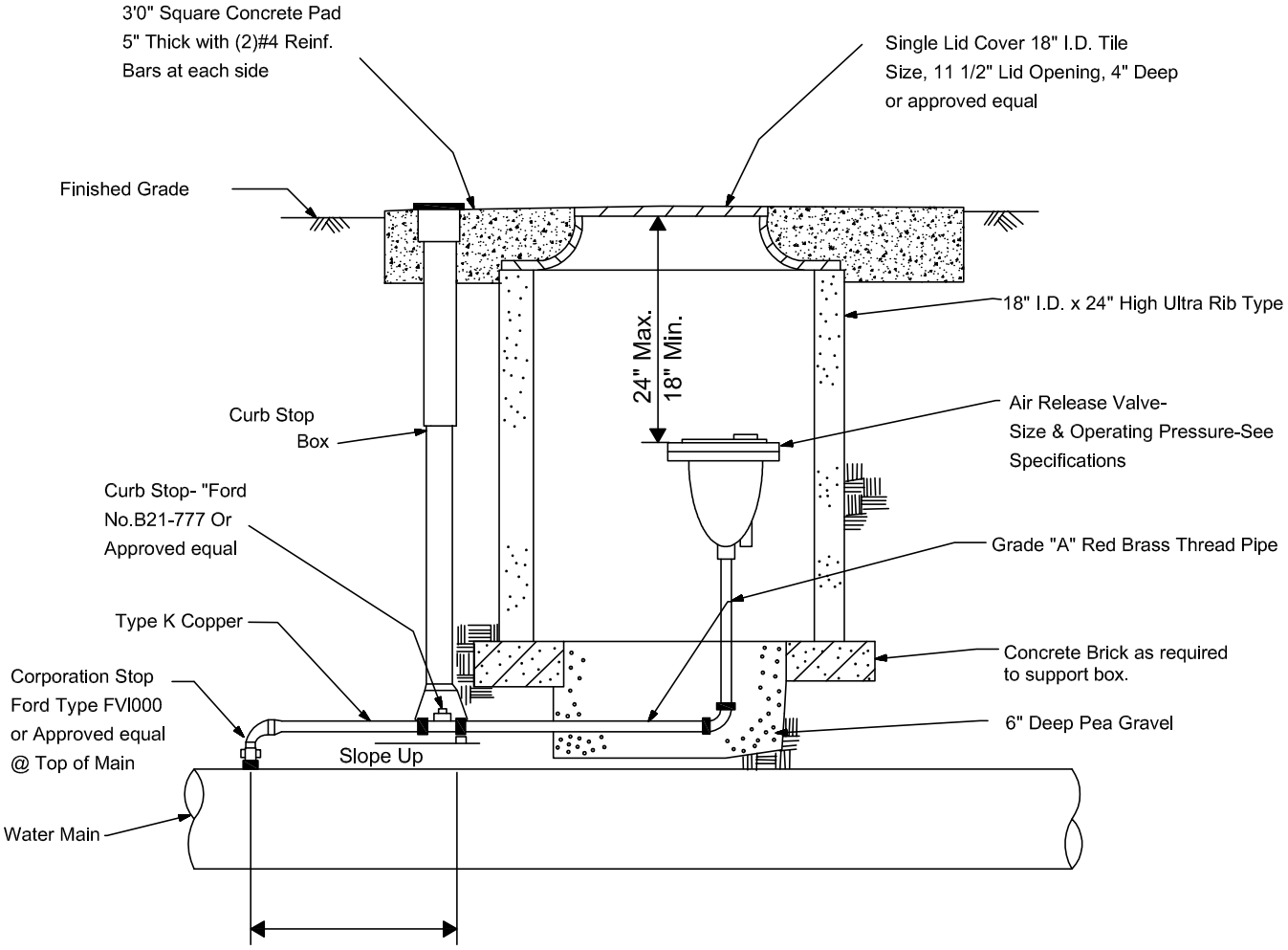
STANDARD DRAWING NO: 105-A



NOTE: Air Release Valve to be centered over water main.
Air Release Valves larger than 1" use:
vault size 24"x24"
lid Ford Type MC 24 &
Extension Ring Ext-2 or approved equal.

AIR RELEASE VALVE

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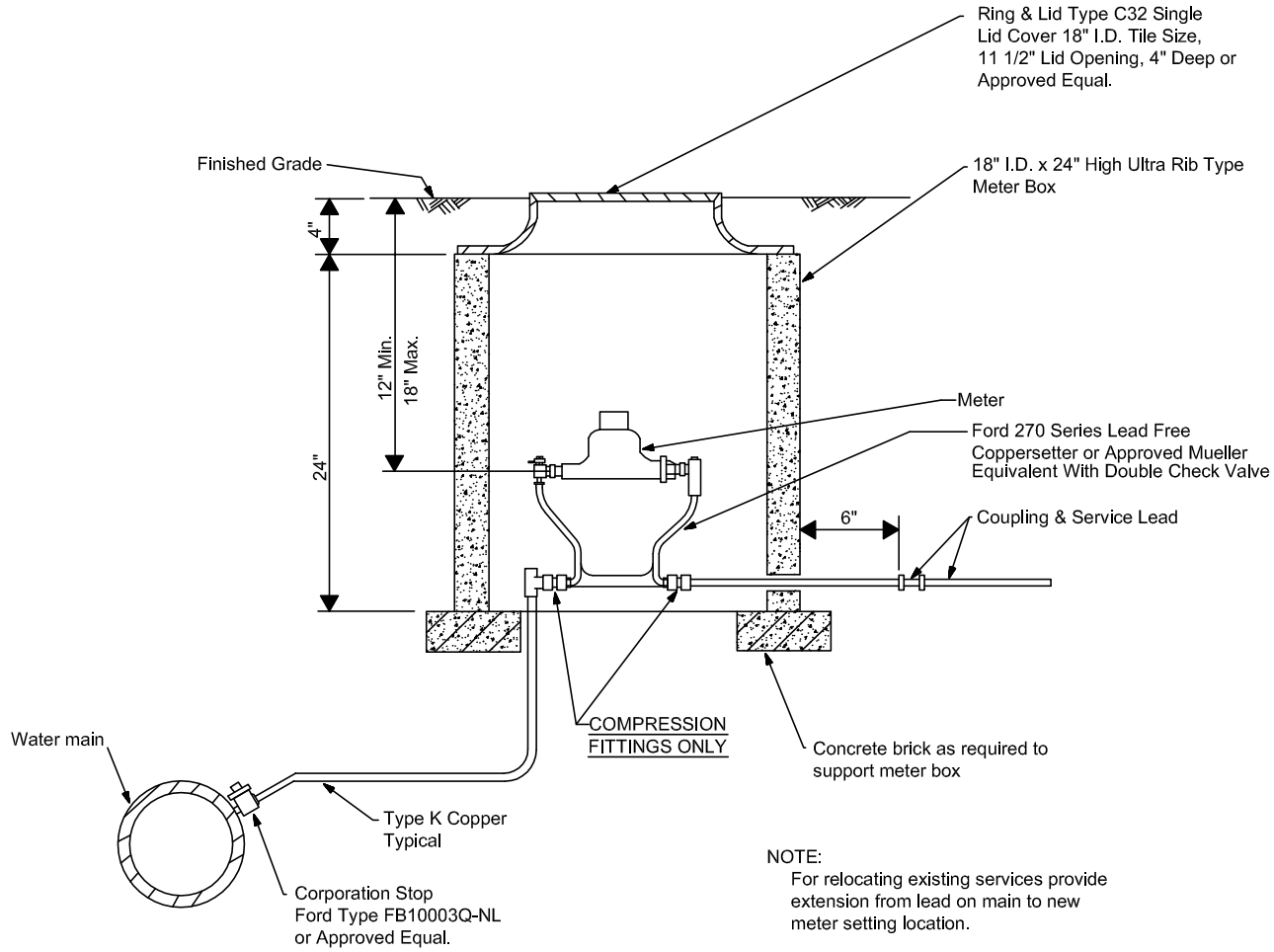
STANDARD DRAWING NO: 106

NOTE:
Services installed in concrete areas, not subject to vehicle traffic, a Ford Type A32, or approved equal, lid and ring shall be used. Areas subject to vehicle traffic, a Ford Type A32HH, or approved equal, lid and ring shall be used.

NOTE:
Services to be removed & abandoned are to be disconnected at corporation stop. Cap corporation stop if required to prevent leaks or replace stop.



NOTE:
For relocating existing services provide extension from lead on main to new meter setting location.

PVC Mains-Use single band brass saddle
Ford Type 202BS-690-3 or equal.

5/8" & 1" METER SETTING

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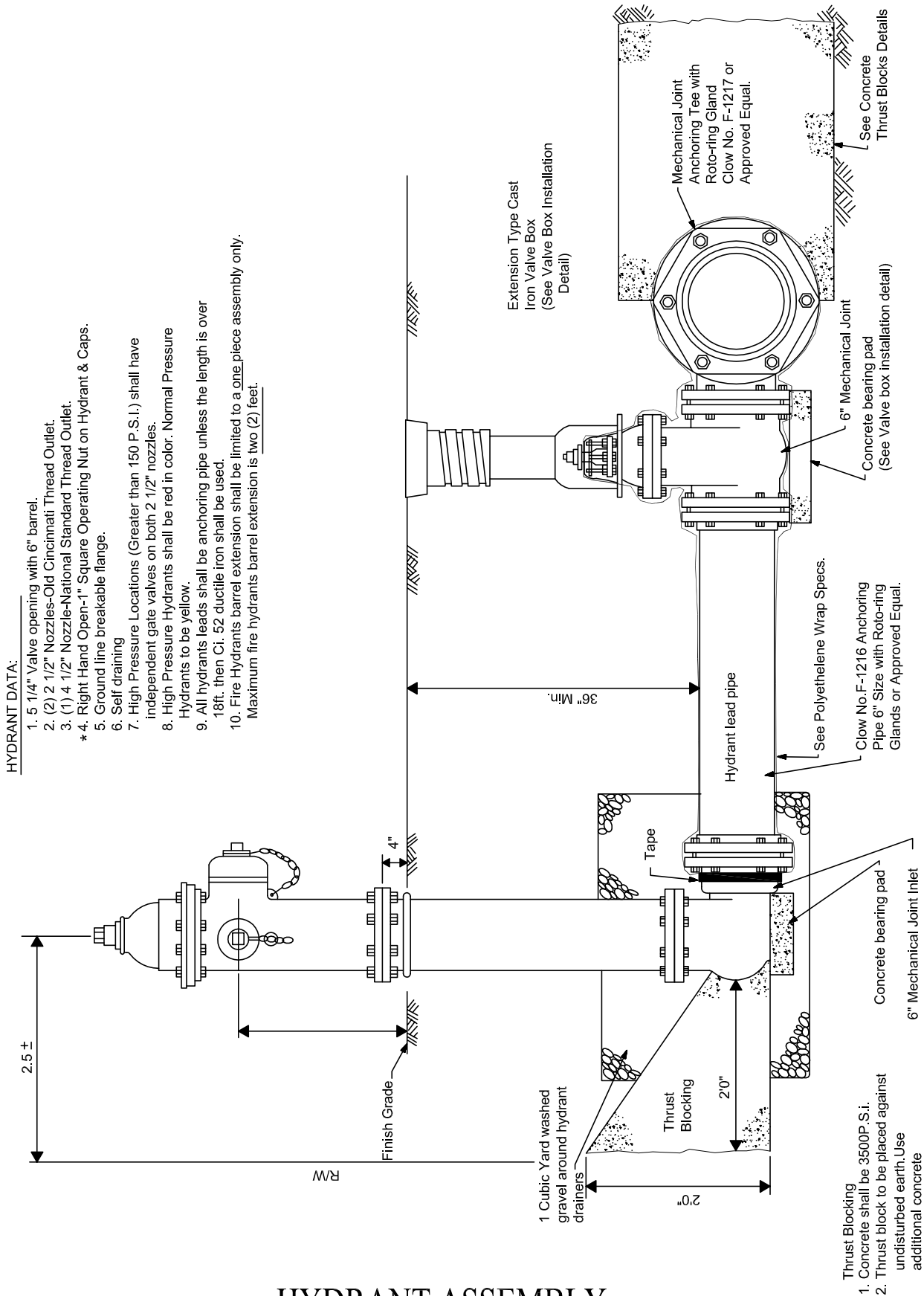
STANDARD DRAWING NO: 107



HYDRANT ASSEMBLY

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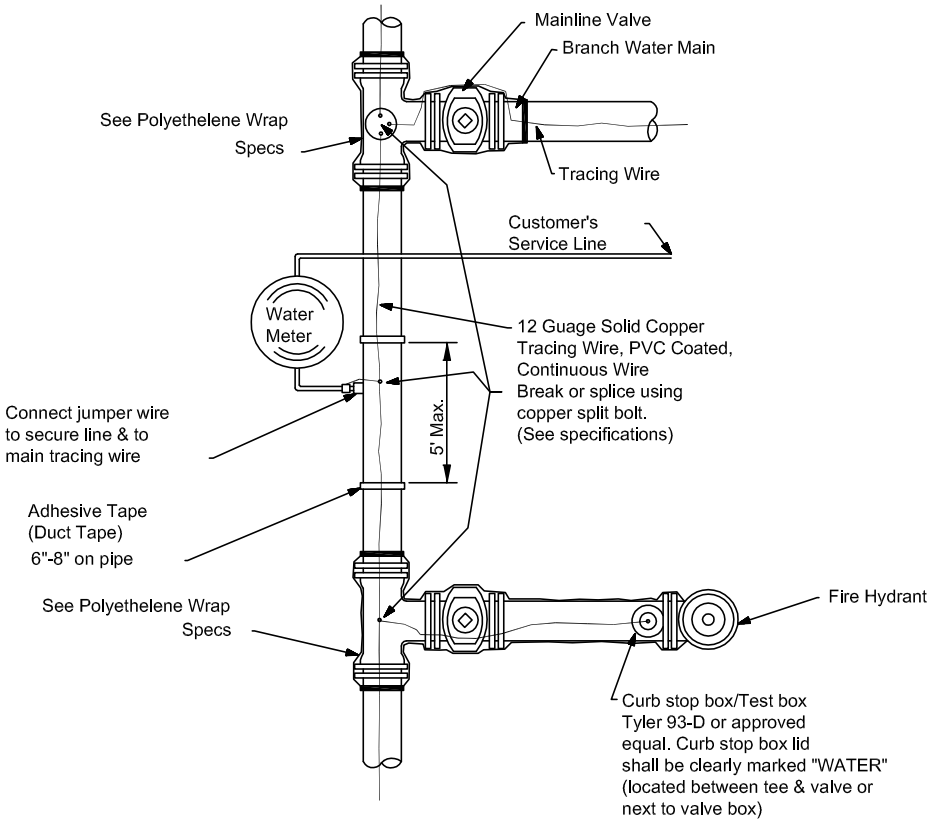
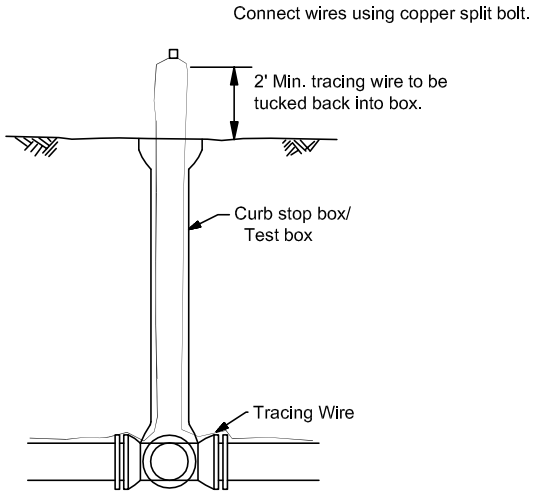
STANDARD DRAWING NO: 109



PVC PIPE WITH DUCTILE IRON FITTINGS

Note: Curb stop box/test box shall not be installed in paved areas.



TRACING WIRE INSTALLATION DETAIL

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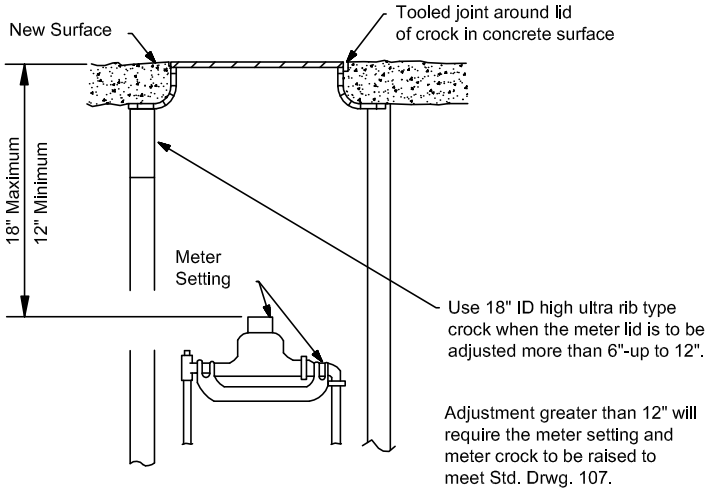
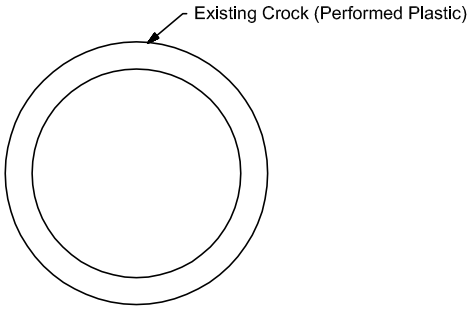
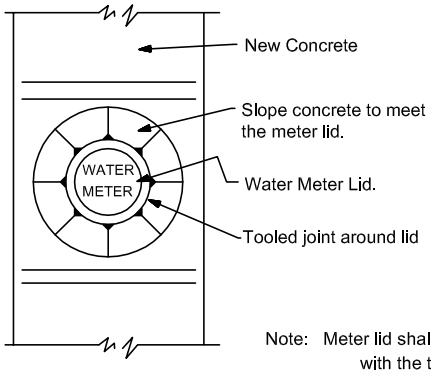
STANDARD DRAWING NO: 111







Note: Meter lid shall be flush with the top of the concrete surface. The concrete surface shall be tapered to provide a smooth transition to the meter lid. A tooled joint shall be formed around the meter lid.

NOTE: SERVICES INSTALLED IN CONCRETE AREAS, NOT SUBJECT TO VEHICLE TRAFFIC, A FORD TYPE A32, OR APPROVED EQUAL, LID AND RING SHALL BE USED. AREAS SUBJECT TO VEHICLE TRAFFIC, A FORD TYPE A32HH, OR APPROVED EQUAL, LID AND RING SHALL BE USED.

PLASTIC (PVC) METER CROCKS shall be raised by use of an adapter with a section of plastic crock cut to achieve final grade.

At no time shall wood be used to adjust the ring and lid to grade.

Meter ring and lids shall be reset solidly and shall have no broken edge to allow dirt to enter the crock.

If the meter box is damaged beyond repair it shall be replaced. See Standard Drawing 107.

RAISING CURB STOPS OR VALVE BOXES:

Curb stop boxes and valve boxes shall be raised by turning the upper section to meet grade. If the upper section cannot be raised in this manner it shall be carefully broken off and replaced.

New upper sections shall be supplied by Contractor.

ADJUSTING RING & LID TO GRADE

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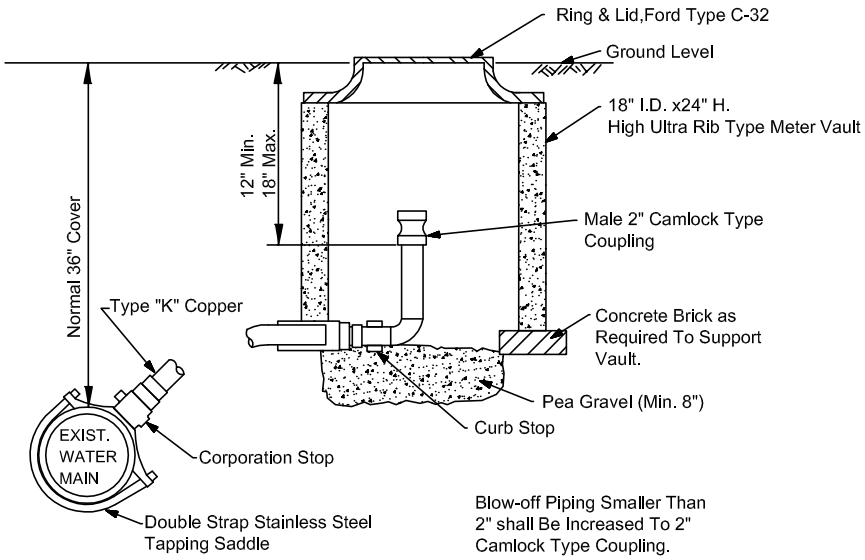
STANDARD DRAWING NO: 112



TYPICAL FLUSHING DEVICE INSTALLATION

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DATE: 2011

STANDARD DRAWING NO: 113

SANITARY SEWER MANHOLE ADJUSTMENT BID ITEM DESCRIPTON AND SPECIFICATIONS

BID ITEM DESCRIPTION

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.

SECTION 02606

MANHOLES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope: CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown on the Design Drawings, specified herein and required to furnish and install all precast and cast-in-place manholes, air release manholes and bypass pumping vaults.

B. General:
   1. Manholes shall conform in shape, size, dimensions, material, and other respects to the details shown or as ordered by ENGINEER.
   2. Cast-iron frames, grates and covers shall be as specified in Section 05540.
   3. Concrete for cast-in-place manholes and for inverts in precast manholes shall conform to the requirements specified under Section 03300.

4. Floor access hatch covers for air release manholes shall be as specified in Section 05536.

C. Related Sections:
1. Division 2 Sections on Earthwork.
2. Section 03300, Cast-In-Place Concrete.
3. Section 05501, Miscellaneous Metal Fabrications.
4. Section 05536, Floor Access Hatch Covers
5. Section 05540, Castings.
6. Division 15 Sections on Piping.

1.2 QUALITY ASSURANCE

A. Reference Standards:
1. ASTM C 33, Standard Specification for Concrete Aggregate.
2. ASTM C 76, Class III Reinforced Concrete Pipes.
3. ASTM C 443, Specifications for Joints for Circular Concrete Sewer and Culvert Pipe, using Rubber Gaskets.
4. ASTM C 478, Specification for Precast Reinforced Concrete Manhole Sections.
5. ASTM C 579, Standard test method for compressive strength of chemical resistant mortars, grouts, monolithic surfacing and polymer concretes.
6. ASTM C 857, Standard Practice for Minimum Structural Design Loading for underground Precast Concrete Utility Structures.
7. ASTM C 923, Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals.
8. ASTM D 695, Standard Test Method for Compressive Properties of Rigid Plastics.
9. ASTM D 790, Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
10. ASTM C 990, Standard Specification for Joints for Concrete Pipe, Manholes, Precast Box Sections Using Preformed Flexible Joint Sealants.
11. ASTM C 1244, Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill.
12. ASTM D 1737, Test Method for Elongation of Attached Organic Coatings with Cylindrical Mandrel Apparatus
13. ASTM D 2240, Standard Test Method for Rubber Property
14. ASTM D 412, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers Tension
15. ASTM D 4161, Standard Specification for Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals.

16. ASTM D 6783, Standard Specification for Polymer Concrete Pipe.
17. ASTM F 477, Specification for Elastomeric Seals (gaskets) for Joining Plastic Pipe.
18. ASTM 4060, Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
19. ASTM 4541, Standard Test Method for Pull Off Strength of Coatings using Portable Adhesion Testers
20. AWWA C 110, Ductile-Iron and Gray-Iron Fittings, 3 in. through 48 in., for Water and Other Liquids.
21. AWWA C 111, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.AWWA C 115, Flanged Ductile-Iron Pipe with Threaded Flanges.
22. AWWA C 151, Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids.
23. AWWA C 302, Reinforced Concrete Pressure Pipe, Noncylinder Type, for Water and Other Liquids.

1.3 SUBMITTALS

A. Shop Drawings: Submit for approval the following:
   1. Design Drawings showing design and construction details of all precast concrete and cast-in-place manholes including details of joints between the manhole bases and riser sections and stubs or openings for the connection of sewers. Design Drawings shall show invert elevations of all pipe connections entering and leaving the manhole along with flowline slope across the base. Design Drawings shall also show the delta angles for all points of intersection, except where more than one line intersects at the same manhole. Where more than one line intersects, the angles relating all lines shall be shown. All angles shall be shown to the nearest second.
   2. Manufacturer's name for all precast structures.

B. Submit a laying schedule of each manhole showing elevations and manhole components to be used from base to casting.

C. For manhole interior linings, submit a description of the method and materials required to line the manhole. Submit a Material Data Safety Sheet (MSDS) for each product used in the lining. A CIGMAT evaluation shall be submitted, if required. Submittals shall also include, as required, work procedures for flow diversion plans and methods/materials used for repair of leaks and cracks in manholes. If required, submit calculations for the round manhole lining that demonstrate hoop strength under maximum hydrostatic conditions. The calculation shall assume zero liner adhesion to the existing structure, but assume lateral support from the existing wall. The calculated hoop stress shall be less than 11% of the compressive strength as determined

by appropriate ASTM test method. Submit a final installation report on manholes that have been lined.

D. Comply with all the requirements of Section 01340.

PART 2 - PRODUCTS

2.1 PRECAST CONCRETE MANHOLES, AIR RELEASE MANHOLES, AND BYPASS PUMPING VAULTS

A. General:

1. Precast manholes shall conform to the details shown on the Standard Details.
2. Concrete shall be minimum 4000 psi compressive strength.
3. Except where otherwise specified precast manhole components shall consist of reinforced concrete pipe sections especially designed for manhole construction and manufactured in accordance with ASTM C 478 except as modified herein.
    a. Standard Manholes shall be six (6) feet or more in depth, measured from the base of the cover frame to the invert of the outlet and shall be concentric cone-type, top construction as shown on the Design Drawings.
    b. Shallow Manholes shall be less than six (6) feet in depth, measured from the base of the cover frame to the invert of the outlet and shall be of flat-top construction as shown on the Design Drawings.
4. Precast, reinforced concrete manhole bases, riser sections, flat slabs and other components shall be manufactured by wet cast methods only, using forms which will provide smooth surfaces free from irregularities, honeycombing or other imperfections.
5. All precast manhole components shall be of approved design and of sufficient strength to withstand the loads imposed upon them. They shall be designed for a minimum earth cover loading of 130 pounds per cubic foot, an H-20 wheel loading, and an allowance of 30 percent in roadways and 15 percent in rights-of-way for impact.
6. Precast concrete manhole sections (including eccentric and concentric cones, risers and grade rings) shall conform to ASTM C 478 except sections deeper than 12 feet shall have reinforcing equal to that of ASTM C76 Class III reinforced concrete pipes, unless otherwise noted on the Design Drawings.
7. Lifting holes, if used in manhole components, shall be tapered, and no more than two shall be cast in each section. Tapered, solid rubber plugs shall be furnished to seal the lifting holes. The lifting holes shall be made to be sealed by plugs driven from the outside face of the section only.

8. Mark date of manufacture, manhole number as shown on the Design Drawings, and name or trademark of manufacturer on inside of barrel.

B. Manhole Bases Sections:

1. Precast concrete manhole base sections shall be "monolithic", consisting of base slab and base riser (barrel) section.
   a. NOTE TO SPECIFIER: DESIGN ENGINEER SHALL REVIEW GROUNDWATER & FLOOD ELEVATIONS IN THE PROJECT AREA & THE POTENTIAL FOR FLOATATION OF THE MANHOLES. DESIGN ENGINEER SHALL SUBMIT CALCULATIONS AND GROUNDWATER DATA VERIFING POTENTIAL FOR MANHOLE FLOATATION. If floatation is found to occur based on the Design Engineer's review, precast base sections shall be furnished with an integral anti-flotation footing, thickness as specified hereinafter, extending trench bank-to-bank as shown in the Standard Details (minimum 8" projection).
   b. Precast concrete manhole base slab thickness shall comply with the following schedule:

0.0' – 15.0'	Vertical Height	- 8" Slab
15.1' – 20.0'	Vertical Height	- 10" Slab
20.1' – 25.0'	Vertical Height	- 12" Slab
25.1' – 30.0'	Vertical Height	- 14" Slab

   c. Manholes over 30 feet shall be designed by a Professional Engineer registered in the State of Kentucky. Submittals shall be provided to SD1 for review & approval.
   d. Manhole bases shall have two cages of reinforcing steel in their walls, each of the area equal to that required in the riser sections. Wall thickness shall not be less than 5 inches.
   e. There should be a minimum of twelve (12") inches between the outside diameters of all pipe penetrations in the base section.
   f. Base riser shall extend a minimum twelve (12) inches above the top of the highest pipe in the base.

2. Flow channel (invert) and apron (bench) shall be poured separately at the point of manufacture to the dimensions shown on the Design Drawings.
   a. The flow channel through manholes should be made to conform in shape and slope to that of the sewers.
   b. Invert shall be smooth and semi-circular in cross-section of the same diameter of the pipe leaving the manhole.
   c. Changes of direction of flow or sewer centerline within the manhole shall be made by forming the flow channel along a smooth curve with as long radius as the inside of the manhole

will allow.

d. Bench shall slope toward invert at not less than one (1) inch per foot.

3. All precast base sections with pipe openings shall be furnished with ASTM C 923 pipe-to-manhole connector gaskets as specified hereinafter.

C. Manhole Barrel Sections:

1. Manhole barrel sections shall have reinforcing steel in their walls, Wall thickness shall not be less than 5 inches.
2. The barrel of the manhole shall be constructed of various lengths of riser pipe manufactured in increments of one foot to provide the correct height with the fewest joints. Openings in the barrel of the manholes for sewers or drop connections will not be permitted closer than one foot from the nearest joint. Special manhole base or riser sections shall be furnished as necessary to meet this requirement.
3. The barrel sections shall be of the height required, but not less than one (1) foot in height. No opening shall be cut into a barrel section, the maximum dimension of which exceeds one-half (1/2) the section height.
4. Joints between manhole components shall be the tongue and groove. The circumferential and longitudinal steel reinforcement shall extend into the tongue and groove ends of the joint without breaking the continuity of the steel. Joints between the base sections, riser sections and top slabs of manholes 72 inches in diameter and less shall be rubber and concrete joints. Joints for manhole components greater than 72 inches in diameter shall be provided with steel bell and spigot rings.
5. Precast manhole section joints shall be joined with one of the following products:
   a. ASTM C 443, a single, continuous rubber O-ring gasket and shall conform to AWWA C302.
   b. ASTM C-990, flexible butyl resin sealant such as Conseal CS-102, CS-202 as manufactured by Concrete Sealants, Inc.
   c. Hamilton-Kent “Kent-Seal No. 2”
   d. K.T. Snyder Co. “Rub’r-Nek”
   e. Press Seal Gasket “E-Z Stik”
6. All precast barrel sections with pipe openings shall be furnished with ASTM C 923 pipe-to-manhole connector gaskets as specified hereinafter.

D. Cone Sections and Top Slab:

1. A precast concentric cone or precast top slab shall be provided at the top of the manhole barrel to receive the cast iron frame and cover or

floor access hatch cover as shown on the Design Drawings. Eccentric cones will be evaluated on a case by case basis.

2. Cone sections and top slabs shall be designed for an H-20 wheel loading, and an allowance of 30 percent in roadways and 15 percent in rights-of-way for impact.
3. Cone sections for standard manholes shall have a minimum 8" thick upper walls and shall not exceed 3'-0" in height.
4. Concrete top slabs shall not be less than 8 inches thick.

E. Drop Manhole:

1. Drop Manholes shall conform to all provisions specified herein, with the additional requirements for the drop pipe as shown on the Design Drawings.
2. The drop pipe shall be of the same material and diameter as the inlet sewer pipe used.
3. Drop pipe shall be totally enclosed in concrete, formed, with a minimum covering dimension of six (6) inches.
4. No drop pipes shall be allowed inside of the manholes, unless otherwise approved by SD1.
5. Base shall be cast to support drop connection.

F. Acceptable Manufacturers

1. Aerocrete
2. Sherman Dixie
3. KOI
4. Hanson
5. or equal

2.2 PRECAST EPOXY RESIN MANHOLES

A. General:

Polymer concrete manholes may be installed in lieu of lined concrete manholes. Polymer concrete manholes shall be manufactured in accordance with ASTM D 6783.

1. Design
   a. Manholes shall be designed to withstand all live loads and dead loads as described in project plans and specifications.
   b. Dead loads shall include overburden load, soil side pressure and hydrostatic loading conditions.
   c. Manholes shall also be designed to resist buoyancy for the project conditions.
   d. Compressive strength: Pipe shall have a minimum unconfined compressive strength of 13,000 psi when measured in accordance with ASTM C 579.

B. Materials:

Resin: The manufacturer shall use only polyester resin systems designed for

use with this particular application.

1. Filler: All aggregate, sand and quartz powder shall meet the requirements of ASTM C 33, where applicable.
2. Additives: Resin additives, such as curing agents, pigments, dyes, fillers and thixotropic agents, when used, shall not be detrimental to the manhole.
3. Elastomeric Gaskets: Gaskets shall be suitable for the service intended. All gaskets shall meet the requirement of ASTM F 477.

C. Manufacturing and Product Construction

1. Manholes: Manhole components shall be manufactured by the vibratory vertical casting process resulting in a dense, non-porous, corrosion-resistant, homogeneous, composite structure. Manhole bases shall be designed to withstand flotation from groundwater or floodwater and movement from high velocities and/or directional changes in flow. The flow channel, benches and inverts must also be of the same material as the manhole, integral within the manhole and installed by the manhole manufacturer and as shown on the standard manhole details drawing.
2. Joints:
   a. The manhole components shall be connected with a compatible epoxy bonding agent or an elastomeric sealing gasket as the sole means to maintain joint water-tightness.
3. Joints at pipe tie-ins shall be ASTM C923 flexible pipe-to-manhole connector gaskets, as specified in Section 2.4. Joints shall be watertight. The connector gaskets shall be integral with the manhole wall. Walls shall have sufficient thickness to install the connector within the hole cored in the manhole wall. Pipe stubs cast into the manhole through the wall to provide the additional wall thickness are not acceptable and will not be allowed.
4. Fittings:
   a. Cones, reducer slabs, base slabs and adjusting rings shall be of the same material as adjoining riser sections.
   b. Fittings shall be manufactured elastomeric gaskets, epoxy bonding or fiberglass overlay.
5. Manhole Steps:
   a. Furnish steel-reinforced polypropylene steps as specified in Section 2.6.
   b. No steps shall be aligned over the flow channel.
   c. Step spacing is 16” as indicated on the Standard Drawings.
6. Acceptable manufacturer: Manufacturer of pipe and fittings shall employ manufacturing methods and material formulations in use for a minimum of ten years.
   a. Meyer Rohr +Schacht GmbH
   b.or equal

2.3 MISCELLANEOUS METALS

A. Metal frames, covers, floor access hatch covers, steps, toe pockets and similar required items shall be provided as shown on the Design Drawings and in accordance with Division 5 Sections on Metal Fabrications.

2.4 FLEXIBLE PIPE JOINT SEAL

A. A flexible pipe joint seal shall be provided in the connection of pipe to manholes and other miscellaneous structures. The rubber seal shall meet the requirements given in ASTM C 923. The seal shall be of a size specifically designed for the pipe size and material.

B. All connecting elements of the seal shall be Type 304 stainless steel.

C. Flexible pipe joint seal shall allow for pipe alignment of up to fifteen (15) degrees deflection.

D. Pipes entering manholes that do not have existing flows and have slopes greater than twenty –six (26) percent shall have fittings (22.5 or 11.25 degree bends) installed immediately outside the manhole.

E. If a flexible pipe joint seal is provided at each manhole wall penetration and the pipe is not rigidly locked into the manhole wall through grouting or other methods, then the 12" maximum pipe stub shown in the SD1 Standard Drawing No. 113 is not required.

F. Acceptable Products:
   1. Kor-N-Seal by NPC, Inc.
   2. A-Lok by A-LOK Products, Inc.
   3. Dura-Seal III by Dura-Tech
   4. Or equal.

2.5 MANHOLE COATINGS AND LININGS

A. Interior Lining

   1. NOTE TO SPECIFIER: All new manholes located within one (1) mile downstream of a force main discharge shall be lined with a corrosion resistant monolithic lining conforming to SD1's Technical Specifications.

Where a force main connects to an existing manhole, that manhole and at least the next three (3) manholes downstream shall be lined with a corrosion resistant monolithic lining conforming to SD1's Technical Specifications. SD1 may also require existing manholes up to one (1) mile downstream of the new force main discharge be similarly lined on a case-by-case basis. The cover on the force main discharge manhole shall be a solid lid (not vented). SD1 may require that additional downstream vented manhole lids be replaced on a case-by-case basis.

Any existing manholes to be lined shall be inspected by the DESIGN ENGINEER and SD1 to determine the conditions of the manholes and confirm if the manholes are suitable for lining. If in the opinion of SD1, the existing manholes cannot be lined, then the manholes shall be replaced.

B. Any concrete manhole designated to be lined on the Design Drawings must have a liner selected from one of the three types listed below or the Epoxy Resin type (Deduct Alternate) specified in section 2.2 above.

1. **Type 1 - Cured-in-place PVC composite liner**

a. As a minimum the manhole liner systems shall be composed of a multiple layered composite. The primary layer shall be manufactured from 20 mils PVC with 10 ounce per square yard polyester fleece. The surface hairs of the fleece must be embedded in the molten PVC during the manufacturing process of the PVCP laminate. Glued laminates are not allowed.

b. The fibrous body will be impregnated with a modified epoxy resin. Add fiberglass and resin, for additional liner thickness.

PVCP20-10=86 mills. (20 mill PVC & 10 oz Fleece). (i.e. no fiberglass).
PVCP20-28=88 mills. (20 mill PVC, 10 oz Fleece & 18 oz Fiberglass).
PVCP20-34=110 mills. (20 mill PVC, 10 oz Fleece & 24 oz Fiberglass).
PVCP20-custom mills (20 mill PVC, 10 oz Fleece & Fiberglass as required).

c. Liner Thickness: The anticipated hydrostatic head "h" in feet above the bottom of the invert and the Radius "R" in feet of the structure shall determine the necessary liner thickness "t" in mils according to the calculation: $t = 3.32 \times R \times h$. Contractor shall calculate "t" for all manholes and provide these calculations to the Owner as part of the liner submittal.

d. Liner shall be PVCP, Multiplexx™ Liner System or approved equal. Manholes receiving an interior lining shall have a polypropylene ladder in lieu of steps.
   i. Ladder shall be Lane Vault Ladder or equal.

2. **Type 2 – SPECTRASHIELD**
SPECTRASHIELD shall only be used on existing manholes in rehabilitation applications.

Lining for existing manholes shall be SPECTRASHIELD Liner System as manufactured by CCI Spectrum, Inc., Jacksonville, Florida; 904-268-4951. Materials shall be designed and manufactured to withstand the severe effects of hydrogen sulfide in a wastewater environment.

CCI Spectrum, Inc. (manufacturer) and Applicator warrant the SPECTRASHIELD manhole liner against failure for a period of 10 years. Failure will be deemed to have occurred if the protective lining fails to (a) prevent the internal deterioration or corrosion of the structure (b) protect the substrate and environment from contamination by effluent. If any such failure occurs within 10 years of initial completion of work on a structure, the damage will be repaired to restore the lining at no cost to the Owner within 60 days after written notification of the failure. Failure does not include damage resulting from mechanical or chemical abuse or act of God. Mechanical or chemical abuse means exposing the lined surfaces of the structure to any mechanical force or chemical substance not customarily present or used in connection with structures of the type involved. There are no warranties express or implied other than those specifically stated in this section 1.03. Any liability for consequential and incidental damages is expressly disclaimed. Liability is limited to and shall not exceed the purchase price paid.

a. The lining system shall be composed of a multi-layered stress skin palled liner system and installed in accordance with the manufacture's specifications. The components are described below:

   i. The moisture barrier shall be a modified polymer and shall have a minimum thickness of 50 mils. The modified polymer shall be sprayable, solvent free, two-component polymeric, moisture/chemical barrier specifically developed for the corrosive wastewater environment.
   ii. The surfacer shall be a polyurethane/polymeric blend foam and shall have a minimum thickness of 400 mils. The foam

shall be consist of two components with low viscosity and contain flame retardants.

iii. The final corrosion barrier shall be a modified polymer and shall have a minimum thickness of 50 mils. The modified polymer shall be sprayable, solvent free, two-component polymeric, moisture/chemical barrier specifically developed for the corrosive wastewater environment.

The total thickness of the multi-component stress panel liner shall be a minimum of 500 mils.

b. The components shall meet the following chemical analysis:

(i) Modified Polymer:

"A Component"	
Viscosity, 77° F, cps., ASTM D-1638	450
Physical State	Liquid
Color	Clear to Amber
Hygroscopicity	Reacts with water

"B Component"	
Viscosity, 77° F, cps., ASTM D-1638	500
Physical State	Liquid
Color	Flamingo Pink
Hygroscopicity	100 %

Reaction Profile (100 grams, 175° F Sample)	
Gel Time, seconds	10
Tack Free Time, seconds	20
Cure Time, seconds	90

A System / B System Volume Ratio	1:1

Typical Physical Properties	
Tensile Strength, PSI	>3600
Elongation, %	>300
Tear Strength, PLI	>5000
Shore a Hardness	96
100% Modulus, PSI	>2500

(ii) Polyurethane Rigid Structure Foam

"A Component"	
Viscosity, 77° F, cps., ASTM D-1638	200
Physical State	Liquid

Color	Dark Brown
Hygroscopicity	Reacts with water and evolves CO_2 gas

"B Component"

Viscosity, 77° F, cps., ASTM D-1638	660
Physical State	Liquid
Color	Transparent Dark
Hygroscopicity	Absorbs water rapidly thus changing ratio

Reaction Profile (100 grams, 77° F Sample)

Cream Time, seconds	1-4
Tack Free Time, seconds	5-8
Rise Time, seconds	6-10

A System / B System Volume Ratio	1:1

Typical Physical Properties

Density, nominal, core, lbs/ft^3 ASTM D-1622, 74° F	4-10
Compression Strength, PSI ASTM D-1621, 74° F Parallel Rise	90-150
Closed Cell Content, % ASTM 1940, 74° F	Over 95
Shear Strength, PSI ASTM C-273, 74° F	225-250

3. **Type 3 – Duraplate 100 Liner System**

Lining for manholes shall be PVC Duraplate 100 Liner System as manufactured by ALOK Products, Tullytown, Pennsylvania; 1-800-822-2565. Liner shall be cast integral into the concrete at the point of precast manufacture.

a. PVC Liner, Channel Joints, H-joints and Corner Joints; Manufactured from polyvinyl chloride resin. White in color to assist in providing a light reflective environment. All sheet compounds shall result in a semi-rigid material for thermoforming to the contour of the structure and shall have a minimum wall thickness of 1.7mm (0.065 inch).

b. Lined manholes shall have a flat top that is lined with the same type of protective liner as the manhole.

c. Rubber gasket between structures shall be provided for a watertight seal. Gasket shall be DURA-Plate-Lok-Sealant MT-320 measuring 0.5 inches by 1.5 inches to be placed on the return. When the two sections are coupled, the butyl-lok will displace over the return on the bell and tongue ends of the liner.

d. Linings shall be installed by a certified lining manhole precaster, while constructing the manhole, in strict conformance with the manufacturer's requirements. The Precaster shall submit certification documentation from ALOK products with the manhole submittals.

i. Inspect the form core for sharp or jagged edges that could damage the liner during the precasting and shipping process.

ii. Place Dura Plate 100 Liner panels level around the core of the form. Form release agent is not necessary.

iii. Install the vertical joints by placing the black rubber strip between the panel returns, making sure that the flap of the strip is fitted over one of the returns.

iv. Place backing plate on the inside return of panel that the flap fits over. Hold together with spring loaded clamps evenly spaced about 12" apart.

v. Secure the panels together with fasteners placed every 3 inches, making sure that each fastener is tightened to 5 in-lbs.

Note: The fasteners must be installed from the side opposite the flap, straight thru the backing plate, parallel to the liner.

vi. Repeat for all seams.

Note: Caulk can be placed between the form core and liner returns to minimize concrete seepage during production.

vii. Install reinforcement into form with any other necessary parts needed for the structure.

viii. Pour concrete around the liner evenly to prevent shifting of the liner.

ix. Vibrate and compact the concrete in a manner that will protect the liner and produce a dense, homogenous structure.

x. Take precaution to protect the liner from sharp or jagged objects while stripping from the form.

xi. Visually inspect the liner after production for any cuts or tears. If repairs are needed, refer to Dura

Plate 100 Liner repair bulletin for proper repair procedures.

E. Steps shall be installed in each manhole at the point of manufacture. Drill all holes in liner larger than the diameter of the step. Install steps or ladder then caulk area around step and liner with FR500 caulking material (lap Sealant) and seal with a minimum 0.5" thickness of ThoRoc SewerGuard epoxy.

F. All hole opening surfaces shall be coated with a minimum 0.5" thickness coverage of ThoRoc SewerGuard epoxy that overlaps the liner at least 1 ½ inches.

G. Manhole Bench and Inverts – The benches and inverts shall be of the same material as the manhole, integral within the manhole and installed by the manhole manufacturer and as shown on the standard manhole detail drawings. The benches and inverts shall be coated with a minimum of 0.5" thickness of ThoRoc SewerGuard epoxy or approved equal. Thickness shall be tested in the field by SD1. CONTRACTOR shall patch all test holes.

H. The procedure below shall be followed at the factory to determine the thickness of epoxy applied to the benching in manholes and structures manufactured.

Procedure:

1. Utilizing a 40 "L x 1.5"W x 0.5"H Nylon rod:
    a. Designate each rod with a corresponding number.
    b. Verify each rod dimension using a caliper.
    c. Initial and date the measurements.
2. Mark the rod with a line at 1" increments.
3. Cut the rod at each line to form segments of 1"L x 1.5"W x 0.5"H.
4. Once the concrete is formed in the base of the manhole or structure space the segments approximately 18" apart and adhere the segments to the concrete such that the 0.5"H is the distance from top of concrete to the tip of the nylon segment.
    a. Document the spacing of each segment on the back of the Manhole or Structure Assembly/Inspection Form.
    b. Initial and date the measurements.
5. As the benching is being applied, it should be above the segments, which are 0.5"H.

6. During the final inspection of the manhole/structure, there should be no visible segments.
   a. Document the observations on the back of the Manhole or Structure Assembly/Inspection Form.
   b. Initial and date the observations.
c. If the difference or thickness of the ThoRoc is 0.5“ – 1.0“ inches at all reference points, the manhole is acceptable.
d. If the difference or thickness of the ThoRoc is less than 0.5“, the thickness is not correct. Inform proper production personnel of the problem and that it needs to be corrected before the manhole/structure is approved.

2.6 MANHOLE STEPS

A. Plastic manhole steps shall be PS1-PF (Press Fit polypropylene plastic) as manufactured by MA Industries, or equal. Steps shall be driven into specially sized holes cast into the manhole section. Holes shall be formed in the manhole section using an insert plug that is removed upon curing.
B. No steps shall be aligned over the flow channel. Step spacing shall be 16” as shown the Standard Detail Drawing.

2.7 MANHOLE RISERS

A. Manhole risers (adjusting rings) 6” to 10” height shall be concrete.
B. Manhole risers 2” to 4” height shall be high density polyethylene as manufactured by Ladtech, Inc.

2.8 VORTEX ASSEMBLIES

A. General

NOTE TO SPECIFIER: Design Engineer shall specify the manhole diameter which will receive the Vortex assembly. The minimum manhole diameter shall be six (6) feet; all other diameters will be evaluated on a case by case basis and approved by SD1.

1. Vortex Assemblies shall be as designed by Vortex Flow, Inc, or approved equal. Vortex Assemblies shall be designed to operate effectively with flows between 15% and 115% of their rated capacity. NOTE TO SPECIFIER: Design Engineer shall specify the design flows.
2. All units supplied to any project must be engraved “U.S. Patent No. 6,419,843”. This should appear 4” down from the top of the inner wall of the Vortex Form and 4” down from the top of the Vortex shaft. The engraving must be readable at any time.
3. All Vortex assemblies shall be manufactured by IPEX USA L.L.C.

(1-800-463-9572) or an IPEX authorized sub-contractor, without exception.

4. All units shall be manufactured to standard specifications produced by Vortex Flow Inc. and supplied under license to IPEX Inc.

B . References

1. American Society of Testing Materials (ASTM)
   a. D618 Conditioning Plastics and Electrical insulating materials for Testing
   b. D1784 Rigid Poly Vinyl Chloride (PVC) Compounds and Chlorinated Poly Vinyl Chloride (CPVC) compounds
   c. D2122 Determining Dimensions of Thermoplastic Pipe and Fittings
   d. D2152 Degree of Fusion of Extruded Poly Vinyl Chloride (PVC) Pipe and Molded Fittings by Acetone Immersion
   e. D2241 Poly Vinyl Chloride (PVC) Plastic Pipe (SDR-PR)
2. American Water Works Association (AWWA)
   a. C900 PVC Pressure Pipe and Fabricated Fittings, 4 through 12''
   b. C905 PVC Pressure Pipe and Fabricated Fittings, 14 through 48"

C. Materials

1. All pipe sections used in the fabrication of the Vortex assembly must be manufactured to AWWA C900 (4"-12" nominal diameter) or AWWA C905 (14" – 48" nominal diameter).
2. All PVC sheet used in the fabrication of the Vortex Assembly to be ½" PVC sheet as per ASTM D1248.
3. The vortex Manufacturer or design engineer shall provide calculations specifying the steel strap anchoring devices to be used. The strapping detail shall be shown on the vortex design drawings.
4. Type 316 SS strapping and anchors shall be provided to anchor the vortex unit to the manhole.

D. Installation

1. Verify that field measurements are as indicated on Shop Drawings.
2. Install components in accordance with shop drawings, manufacturer's instructions, and Standard Drawings.
3. Align Work plumb and level.
4. Rigidly anchor to substrate with Type 316 SS straps to prevent misalignment.
5. Do not allow the PVC Vortex device to be stored uncovered and open to sunlight. Do not store the finished Work uncovered and open to sunlight.

E. Tolerances
1. Maximum variation from true dimension: 1/4 inch.
2. Maximum offset from true position: 3/8 inch.

2.9 EXTERNAL SLEEVE FOR STRUCTURE

A. Provide external sleeve around all manhole joints and the chimney as designated on the plans. Any manholes located within fifty (50) feet or less of a creek/ stream or within a floodplain shall have an external sleeve. External sleeve shall be a wraparound heat shrinkable sleeve that creates a barrier to water infiltration and protects support of the structure and frame from ground moisture prevents corrosion and freeze-thaw damage. The system shall be compatible with and bond to concrete, metal, and fiberglass using an adhesive type primer. The sleeve shall have the following physical properties:

Softening Point	212 degrees Fahrenheit	ASTM E-28
Lap Shear Strength	12 PSI	DIN 30 672
Tensile Strength	2900 PSI	ASTM D-638
Elongation	600%	ASTM D-638
Hardness	46 Shore D	ASTM D-2240
Abrasion Resistance	45 mg	ASTM D-1044
Peel Strength	9PLI	ASTM D-1000
Water Absorption	0.05%	ASTM D-570
Low Temperature	-40 degrees Fahrenheit	ASTMD-2671D
Minimum Width	12 inches	

B. System shall accommodate ground movement and resists soil stress.

C. Acceptable Products:
1. WrapidSeal – Manhole Encapsulation System by Canusa –CPS.
2. Link- Seal Riser- Wrap Heat Shrink System.
3. Or Equal.

PART 3 - EXECUTION

3.1 MANHOLE BASES

A. General
1. Manholes shall be constructed at the locations shown on the Design Drawings.

2. The dimensions shall be as shown on the detail sheets and the depths shall be as indicated by either finished top elevation given or depth dimension given on the plans.
3. Perform Sitework as per the requirements of Specifications Sections 02050, 02110, 02220, and 02222.
4. Excavation for manholes and other underground structures shall be of sufficient size to adequately accommodate installation and proper centering.
5. The bases shall be placed directly on an 8-inch to 12-inch deep pad (compacted thickness) of pipe bedding material as specified in section 02220, placed to proper elevation and leveled, unless a deeper excavation is required to remove any loose sandy soils or soft to medium stiff, clayey soils down to a soil stratum suitable for support of the manhole and base.
    a. The excavated soils shall be replaced with an appropriate Structural Backfill material or with controlled, low-strength material (CLSM), lean concrete, or an extra thickness of manhole base concrete.
6. The excavation shall be kept free of water while the manhole is being constructed and manhole shall not be backfilled until inspected by the OWNER.
7. CONTRACTOR will be required to compact bedding material around the entire circumference of the manhole and manhole excavation area to at least 12-inches above the highest incoming or outgoing pipe.
8. Compacted backfill as specified on the Design Drawings or section 02220 shall then be placed above the compacted bedding material up to finished grade.

B. Pre-Cast Bases
1. The OWNER reserves the right to inspect precast manhole base sections at the construction site and to reject the use of such sections if the OWNER determines the products unsuitable for the OWNER'S installation.
2. Pre-Cast bases shall be used in lieu of doghouse manholes where flow permits, as determined by the ENGINEER.

C. Cast-in-Place Bases
1. Cast-in-Place Bases shall be used when installing a doghouse manhole over an existing sewer or as approved by the ENGINEER.
    a. Cast-in-place bases shall be placed on suitable foundations after the pipes are laid as specified in 3.1.A.5.
2. The base shall be cast monolithically to an elevation at least 12 inches above the top of the highest pipe entering the manhole, except where a drop connection is to be installed.
    a. Base thickness shall be as per 2.1.B.1.

b. Base, walls and bottom shall be at least of the thickness shown and reinforced to withstand the loads to be expected.
c. Connections for sewer pipes shall conform to SD1's standard detail.
d. The base of the bell or groove end at joints between components shall be buttered with 1:2 cement-sand mortar to provide a uniform bearing between components.
e. All joints shall be sealed with cement mortar inside and out and troweled smooth to the contour of the wall surface.
f. Raised or rough joint finishes will not be accepted.

3.2 PRECAST MANHOLE SECTIONS

A. Set sections vertical with steps and sections in true alignment.

B. Install sections, joints and gaskets in accordance with manufacturer's recommendations.

3.3 MANHOLE CHANNELS

A. All invert channels through manholes shall be constructed of 4000 psi concrete.

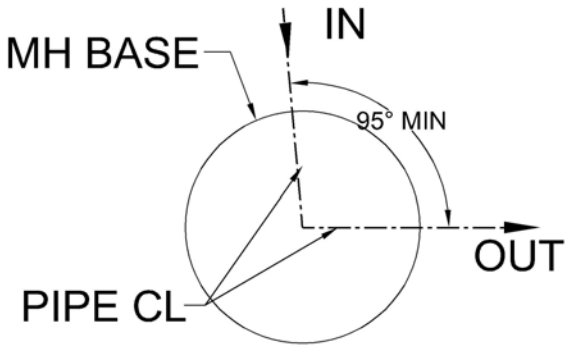
B. The flow line (channel) and benches shall be cast separately from the floor and side wall at the place of manufacture, unless otherwise approved by SD1.

C. Channels shall be properly formed to the sizes, cross sections, grades and shapes shown or as ordered.

D. Benches shall be built up to the heights shown or as ordered and given a uniform wood float finish.

E. Care shall be taken to slope all benches for proper drainage to the invert channel.

F. All flow channel angles between any new incoming pipe and new outgoing pipe shall be at least 95 degrees in the direction of flow as seen in the figure below. For any pipe with velocities exceeding 5 ft/s consult SD1 for the required angle or for the need of an oversized manhole.



3.4 GRADE RINGS

A. Grade rings shall be used for all precast and masonry manholes to adjust height of manhole frame casting where required.
   1. Grade rings shall be a maximum of 10 inches in height, constructed on the roof slab or cone section on which the manhole frame and cover shall be placed.
   2. The height of the grade ring shall be such as is necessary to bring the manhole frame to the proper grade.
   3. One piece precast concrete rings shall be used for grade adjustment greater than six (6) inches and up to ten (10) inches in height. Rings shall be set concentrically on top of the cone section or top slab if used.
   4. High density polyethylene risers shall be used for grade adjustment from two (2) inches to a maximum of six (6) inches in height. Rings shall be set concentrically on top of the cone section or top slab if used.
   5. All grade rings shall be sealed using two rows of butyl rubber sealant.

B. The casting frame shall be installed on the riser as previously described with four (4) five-eights (5/8) inch diameter stainless steel bolts extending through the riser, grade rings, and into the cone section or top slab.
   1. The riser and cone may also be drilled with four (4) equally spaced five-eights (5/8) inch diameter holes and four (4) No. 5 steel reinforcement bars installed and left flush with the riser top to prevent lateral movement and the casting frame bolted to the riser as previously described.

C. High Density Polyethylene Manhole Adjusting Rings shall be used to adjust up to a maximum of six (6) inches.

3.5 PIPE CONNECTIONS TO MANHOLES

A. A flexible pipe-to-manhole joint connector shall be used for joining piping to manholes and other miscellaneous structures. The rubber seal shall meet the requirements given in ASTM C 923. The seal shall be of a size specifically designed for the pipe size and material and be as specified herein.
   1. If a Kor-N-Seal joint seal or equal with a stainless steel tightening band is used, CONTRACTOR shall tighten the band to the proper torque as specified by the manufacturer.
   2. If the slope of the incoming sewer exceeds 26% from the horizontal, a fitting shall be used outside the manhole wall to facilitate a more perpendicular connection to the manhole wall. The use of this fitting is to be evaluated on a case by case basis by sd1 engineers.

B. All pipe connections to manholes shall match crowns. If matching crowns is not possible, a drop manhole may be approved by SD1.

C. All drop manholes shall be approved by SD1. Drop manholes may be acceptable under the following conditions:
   1. If the slope of the influent sewer is greater than or equal to five (5) percent, SD1's drop connection detail 114 shall be followed. All other influent sewer slopes and drop connections will be evaluated on a case by case basis.
   2. All other drop manhole requests shall be approved on a case by case basis including but not limited to pipe realignments, connections to existing manholes, etc.

      NOTE TO DESIGN ENGINEER: SD1 prefers matching crowns for sewer connections; however, depending upon depth of the sewer, drop manholes will be evaluated. Contact SD1 to discuss the details of the design for the project.

   3. If the total height of the drop is greater than sixteen (16) feet, a Vortex assembly shall be used. See Section 2.8.

D. Slide manholes shall not be used.

3.6 CONNECTIONS TO EXISTING MANHOLES

A. Perform by core drilling in accordance with section 01045.

B. A flexible pipe-to-manhole joint connector shall be used for joining new piping to existing manholes and other miscellaneous structures. The rubber seal shall meet the requirements given in ASTM C 923. The seal shall be of

a size specifically designed for the pipe size and material and be as specified herein.

1. If a Kor-N-Seal joint seal or equal with a stainless steel tightening band is used, CONTRACTOR shall tighten the band to the proper torque as specified by the manufacturer.

C. The flow channel and bench for the new connection shall be constructed onsite or the existing flow channel and bench modified to accept the new piping.

D. New connections to existing manholes need to be greater than ninety (90) degrees to the existing flow channel in the direction of the flow.

E. Where new flows joining an existing eight (8) inch sewer that is flowing half pipe or greater, or the exiting pipe is twelve (12) inches or greater, an oversized manhole shall be installed to allow a smooth, sweeping flow transition. Consult SD1 for required manhole diameter.

F. Perform all connections in accordance with Parts 3.9 and 3.11 of this section.

3.7 DOGHOUSE MANHOLES

For joining new pipe to existing pipe, refer to Item 3.1.B.2 of this section for requirements. Doghouse manholes shall only be used for connections to sewer mains with high flows, as determined by the ENGINEER. Doghouse manholes must be approved by SD1. For applications using doghouse manholes, refer to Item 3.1.C of this section and SD1 Standard Detail No.106 for requirements.

3.8 INTERIOR LINING

Any concrete manhole designated to be lined on the Design Drawings must have **Type 1 - Cured-in-place PVC composite liner, Type 2 – SPECTRASHIELD Liner System, or Type 3 – Duraplate 100 Liner System.** Epoxy Resin manholes can also be used in lieu of lined manholes as a Deduct Alternate (see Section 2.2).

A. Cured-in-place PVC Composite Liner:

1. Description of Work
   a. This work shall include the furnishing of all labor, materials, and equipment for the installation of a cured-in-place PVC composite liner within a new sanitary sewer manhole.
   b. The manhole liner shall be manufactured to the shape of the manhole. The fibrous portion of the liner shall be saturated with a modified epoxy resin, then pressurized and cured in-place.
   c. A removable inflation bladder shall be pressurized between ½ - 5 pounds per square inch. The bladder will be removed

upon completion of the curing.

d. The exposed surface of the liner shall be white PVC.

2. Liner Performance Requirements

a. Liner shall be of the type that allows lining of a concentric, eccentric or flat top manhole without removing the manhole ring and top section or corbel.

b. The liner shall be installed and cured in place via controlled curing by heat and pressurization in the manhole to complete the curing process.

c. The lining of the manhole shall result in a monolithic structure to the shape and contour of the existing manhole. The liner shall be installed and bond to the interior manhole substrate and be completely watertight, and free of any joints or openings other than pipe inlets, outlets and the cover frame opening.

d. Where indicated on the manhole schedule, the lining shall be designed with independent structural hoop strength for full height hydrostatic pressure as if the liner were a secondary vessel inside the existing manhole. The manufacturer shall design adequate liner thickness into the system with or without additional fiberglass layers.

e. All lined manholes shall have lined inverts. Plug the pipes entering the manhole and line the flow channel to the edge of the pipe. Trim all pipe openings and seal trimmed edges with a coating of epoxy mastic.

3. Preparation

All surfaces of the manhole shall be cleaned with a high-pressure water-jet sprayer with an operating pressure of at least 3,500 psi. Pressure wash the manhole to remove all dirt, grease, sand, and surface contaminants on the wall and floor leaving a clean damp surface.

4. Liner Installation

a. Installation shall be by an installer that is qualified by the liner manufacturer. The Contractor shall include the furnishing of all materials, equipment, tools, and labor as required for the rehabilitation of the manholes selected, including the installation of the interior liner.

b. The installation of the approved liner system shall be in strict accordance with the manufacturer's instructions. This shall include the preparation, installation, inflation, curing, and finishing operations, required for the completion of the manhole lining process.

c. All safety rules and regulations, applicable laws, and insurance requirements shall be observed in storing, handling, use, and application of the liner materials, resins, and any solvents.

d. Ventilation shall be provided to the workers at all times.

5. Warranty

The CONTRACTOR shall warrant to the OWNER in writing the installation, fabrics, and resins to be free of defects in workmanship and materials for a period of ten years.

B. SPECTRASHIELD Liner System

The applicator of the SpectraShield liner system shall be trained and certified by the manufacturer for the handling, mixing, application and inspection of the liner system as described. To ensure total unit responsibility, all materials and installation thereof shall be furnished and coordinated with/by one supplier/applicator who turnkeys the work and assumes full responsibility for the entire operations.

1. Inspection
   a. Applicator shall take appropriate action to comply with all local, state and federal regulations including those set forth by OSHA, EPA, the Owner and any other applicable authorities.
   b. Prior to conducting any work, perform inspection of structure to determine need for protection against hazardous gases or oxygen depleted atmosphere and the need for flow control or flow diversion.
   c. Submit plan for flow control or bypass to owner/engineer for approval prior to conducting the work.
   d. New Portland cement structures shall have endured a minimum of 28 days since manufacture prior to commencing installation of the liner system.
2. Description of Work
   a. This work shall include the furnishing of all labor, material, and equipment for the installation of SpectraShield liner system within a new sanitary sewer manhole.

3. Surface Preparation
   a. Conduct surface preparation program to include monitoring of atmosphere for hydrogen sulfide, methane, low oxygen or other gases, approved flow control equipment, and surface preparation equipment.
   b. Surface preparation methods may include high pressure water cleaning, hydro blasting, abrasive blasting, grinding, detergent water cleaning and shall be suited to provide a surface compatible for installation of the liner system.
   c. Surface preparation method shall produce a cleaned, abraded and sound surface with no evidence of laitance, loose concrete, brick or mortar, contaminants or debris, and shall

display a surface profile suitable for application of liner system.

d. After completion of surface preparation, perform the seven point check list, which is the inspection for:
1. Leaks 5. Ring and Cover condition
2. Cracks 6. Invert Condition
3. Holes 7. Inlet and Outlet Pipe Condition
4. Exposed Rebar

e. After the defects in the structure are identified, repair all leaks with a chemical or hydraulic sealant designed for use in field sealing of ground water. Severe cracks shall be repaired with a urethane based chemical sealant. Product to be utilized shall be as approved by owner/engineer prior to installation. Repairs to exposed rebar, defective pipe penetrations or inverts, etc. shall be repaired utilizing non-shrink grout or approved alternative method.

4. Material Installation
   a. Application procedures shall conform to recommendations of the manufacturer, including materials handling, mixing, environmental controls during application, safety and spray equipment.
   b. Spray equipment shall be specifically designed to accurately ratio and apply the liner system.
   c. Application of multi-component liner system shall be in strict accordance with manufacturer's recommendation. Final installation shall be a minimum of 500 mils. A permanent identification and date of work performed shall be affixed to the structure in a readily visible location.
   d. Provide final written report to owner/engineer detailing the location, date of report, and description of repair.

5. Post-Construction Inspection
   a. Final liner system shall be completely free of pinholes or voids. Liner thickness shall be the minimum value as described herein.
   b. Visual inspection shall be made by the Owner/Engineer. Any deficiencies in the finished liner system shall be marked and repaired according to the procedures set forth by Manufacturer.
   c. The sewer system may be returned to full operational service as soon as the final inspection has taken place.

3.9 STUBS FOR FUTURE CONNECTIONS

A. Installation of stubs for future connections shall be evaluated on a case by case basis and approved by SD1. If stubs are approved, PVC, ductile iron, or fiberglass pipe stubs with approved watertight plugs shall be installed in manholes. SD1 requires that future connections to existing manholes be cored and the benching modified to accept the new connection. Where pipe stubs, sleeves or couplings for future connections are shown or ordered, CONTRACTOR shall provide all materials and work for their construction.

B. If stubs are approved by SD1, stubs out of manholes shall be a two (2) to five (5) foot stick of pipe with sealed caps. When future connections are made to these manholes, the stubs shall be removed and a full stick of pipe shall be installed at the proper slope.

C. Where connections are made to existing manholes installed after May 15, 2000, the existing manhole shall be vacuum tested prior to the connection being made. If the manhole is vacuum tested prior to alterations and fails, it is the responsibility of SD1 to repair or replace the manhole. If the manhole passes the vacuum test prior to connection, but fails the vacuum test after the connection is made, then the CONTRACTOR shall repair or replace the manhole per SD1's direction and approval.

If the CONTRACTOR fails to vacuum test the manhole prior to any connections being made, and the manhole fails the vacuum test after the connection, the CONTRACTOR shall repair or replace the manhole per SD1's direction and approval.

D. If the connection to an existing manhole is cored, the connection shall be booted and the existing manhole shall pass a vacuum test after all work is complete, if the existing manhole was installed after May 15, 2000.

E. If the elevation or grade of an existing manhole is altered, the existing manhole shall pass a vacuum test after all work is complete, if the existing manhole was installed after May 15, 2000.

3.10 GRADING AT MANHOLES

A. Manholes shall be installed to conform to the following convention unless otherwise called for on the plans. The ground surface shall be graded to drain away from the manhole. Final dimensions shall be determined after grading has taken place.
   1. Manholes in roads, parking lots, paved areas and lawns shall be installed flush with the surrounding area.
   2. Manholes in wooded or other inaccessible areas shall be installed twelve (12) inches above the final grade.
   3. Manholes in cultivated fields, hay fields and pastures shall be

installed with the cone section flush with the final grade. After installation of the casting, a slope fill 1:5 (1 vertical to 5 horizontal) shall be installed to provide surface drainage away from the manhole.

B. Manholes in paved areas shall be constructed to meet the final surface grade. In paved areas on State Highways, all manholes shall be 1/2 inch below final wearing surfaces. Manholes shall not project above finished roadway pavements to prevent damage from snowplows.

C. CONTRACTOR shall be solely responsible for the proper height of all manholes necessary to reach the final grade at all locations. CONTRACTOR is cautioned that ENGINEER'S review of Shop drawings for manhole components will be general in nature and CONTRACTOR shall provide an adequate supply of random length precast manhole riser sections to adjust any manhole to meet field conditions for final grading.

3.11 MANHOLE WATERTIGHTNESS

A. All manholes shall be free of visible leakage. Each manhole shall be tested for leaks and inspected. If the manhole fails a visual leakage inspection and/or vacuum testing, SD1 will consider the manhole defective and the Contractor shall replace the manhole and make any necessary reconnections to the new or existing pipelines at no additional cost to the Owner. No leak repairs shall be performed without the ENGINEER'S approval.

B. Vacuum test manholes to ASTM C 1244. Testing to be witnessed by OWNER. Manholes not subject to vacuum testing must be in writing from OWNER. This specification shall govern the negative air pressure (vacuum) testing of sanitary sewer manholes and structures and shall be used as a method of determining acceptability by the OWNER, in accepting maintenance of a sanitary sewer manhole or structure on behalf of the public. Other forms of testing of some manholes may be required, as deemed necessary by the Owner.

C. Manholes shall be tested after installation with all connections in place along with the following completed prior to testing:
   1. Lift holes, if any, shall be plugged with an approved, non-shrinkable grout prior to testing.
   2. Drop connections shall be installed prior to testing.
   3. The vacuum test shall include testing of the seal between the cast iron frame and the concrete cone, slab or grade rings.
   4. The manholes shall be backfilled and finished to design grade prior to test.
   5. Test pressure requirements of ASTM C-923 shall be met.

D. Test Procedure:

1. Temporarily plug, with the plugs being braced to prevent the plugs or pipes from being drawn into the manhole, all pipes entering the manhole at least eight inches into the sewer pipe(s). The plug must be inflated at a location past the manhole/pipe gasket.
2. The test head shall be placed inside the frame at the top of the manhole and inflated, in accordance with the manufacturer's recommendations.
3. A vacuum of 10" of mercury shall be drawn on the manhole. Shut the valve on the vacuum line to the manhole and disconnect the vacuum line.
4. The pressure gauge shall be liquid filled, having a 3.5 inch diameter face with a reading from zero to thirty inches of mercury.
5. The manhole shall be considered to pass the vacuum test if it holds at least 9 inches of mercury for the following time durations:

	Time (Minutes)		
Manhole Depth	4’ Diameter	5' Diameter	6' Diameter
20 Feet or Less	1	2	3
20.1 to 30 Feet	2	3	4

Note: Consult SD1 on manhole diameters larger then six (6) feet.

6. If a manhole fails the vacuum test, SD1 will consider the manhole defective and the CONTRACTOR shall replace the manhole and/ or defective components and make any necessary reconnections to the new or existing pipelines at no additional cost to the Owner. No repairs shall be made to the manhole unless approved by the ENGINEER.
7. All temporary plugs and braces shall be removed after each test.
8. Manholes will be accepted as having passed the vacuum test requirements if they meet the criteria stated above.

+ + END OF SECTION + +

N O T I C E

DEPARTMENT OF THE ARMY CORPS OF ENGINEERS
KENTUCKY DIVISION OF WATER

LETTER OF PERMISSION AUTHORIZATION AND
KY WATER QUALITY CERTIFICATION

PROJECT: KY 237 Reconstruction and Widening
Boone County, KY
KYTC Item No. 6-8001.21

The Section 404 & 401 activities for this project have been permitted under the authority of the Department of the Army Nationwide Letter of Permission (LOP) & Division of Water Individual Water Quality Certification. In order for these authorizations to be valid, the attached conditions must be followed. The contractor shall post a copy of these authorizations 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 Corps of Engineers. A copy of any request to the Corps of Engineers 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.

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
P.O. BOX 59
LOUISVILLE KY 40201-0059
FAX: (502) 315-6677
http://www.lrl.usace.army.mil/

November 21, 2017

Regulatory Division
South Branch (RDS)
ID No. LRL-2017-687-ncc

Mr. John Purdy
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, Kentucky 40622

Dear Mr. Purdy:

This is in regard to your application for a Department of the Army (DA) permit, dated October 4, 2018, concerning a plan to reconstruct and widen portions of KY Highway 237 in Union, Boone County, Kentucky. We have reviewed your application and have made the following determinations: the work is minor in nature, will not have a significant impact on the environment, and should encounter no opposition.

Based on these determinations, your proposed work satisfies the Letter of Permission criteria, as specified in our regulations. Therefore, you are authorized, in accordance with 33 USC 403, to discharge fill material into 766 linear feet of ephemeral streams, 1,487 linear feet of intermittent streams, 515 linear feet of perennial streams, 0.92 acres of wetland, and 0.89 acres of open water. This permission is granted with the following Special Conditions:

a. The project will be constructed in accordance with the plans included in the October 4, 2017 application for KYTC Item No. 6-8001.21 and all subsequent information received regarding changes to the original submittal.

b. The permittee shall commit to sediment and erosion control measures in the Biological Assessment (pages 17-19) that shall be used to minimize potential adverse effects on gray bat foraging habitat.

c. The permittee shall comply with the processes identified in the Interim Programmatic Agreement for Forest Dwelling Bats between the FHWA, the KYTC, and the USFWS.

d. Two weeks after receipt of the signed LOP from KYTC, the Corps will update the Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITS) by debiting 2,579

AMUs from the KYTC Beaver Creek Mitigation Bank to compensate for 2,421 linear feet of stream impacts. This update will confirm the use of AMUs at the KYTC Beaver Creek Mitigation Bank.

e. Two weeks after receipt of the signed LOP from KYTC, the Corps will update the Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITS) by debiting 2 AMUs from the KYTC Bath County Mitigation Bank to compensate for 0.90 acre of wetland impacts. This update will confirm the use of AMUs at the KYTC Bath County Mitigation Bank.

f. The time limit for completing the work authorized ends on November 21, 2022. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least 1 month before the above date is reached.

g. You must agree to comply with the enclosed General Conditions.

This authorization will be effective as soon as we receive your signed acceptance of these conditions. Please sign and date the duplicate copy of this letter in the space provided and return the signed copy in the enclosed envelope. Note that we also perform periodic inspections to ensure compliance with our permit conditions and appropriate Federal laws.

This letter contains a proffered permit. If you object to this Letter of Permission decision, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this Letter of Permission decision you must submit a completed RFA form to the Lakes and Rivers Division Office at the following address:

U.S. Army Engineer Division,
ATTN: Appeal Review Officer CELRD-PD-REG
550 Main Street - Room 10524
Cincinnati, Ohio 45202-3222

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by **January 20, 2018**.

It is not necessary to submit an RFA form to the Division office if you do not object to the decision in this letter.

Copies of this letter will be sent to the appropriate coordinating agencies (see enclosure for addresses).

FOR THE DISTRICT ENGINEER:

David Baldridge
Chief, South Branch
Regulatory Division

Enclosures

(I accept the conditions of this authorization):

Kentucky Transportation Cabinet

Date

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
P.O. BOX 59
LOUISVILLE KY 40201-0059
FAX: (502) 315-6677
http://www.lrl.usace.army.mil/

November 28, 2017

Regulatory Division
South Branch (RDS)
ID No. LRL-2017-687-ncc

Mr. John Purdy
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, Kentucky 40622

Dear Mr. Purdy:

This is in regard to Department of the Army (DA) permit ID No. LRL-2017-687-ncc, dated November 21, 2017, which authorized a plan to reconstruct and widen portions of KY Highway 237 in Union, Boone County, Kentucky. The permit erroneously required the debiting of 2 wetland Adjusted Mitigation Units (AMUs) from the Kentucky Transportation Cabinet (KYTC) Bath County Mitigation Bank. The correct wetland AMUs amount is 1.8. This letter modifies the permit to authorize the debit of 1.8 AMUs. All other conditions of the original permit remain in full force and effect.

Copies of this letter will be sent to the appropriate coordinating agencies (see enclosure for addresses).

If we can be of any further assistance, please contact us at the above address, ATTN: CELRL-RDS or call Norma Condra at 502-315-6680.

FOR THE DISTRICT ENGINEER:

David Baldridge
Chief, South Branch
Regulatory Division

COORDINATING AGENCIES

Mr. Duncan Powell
USEPA, Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303-8960

Mr. Lee Andrews
U.S. Fish & Wildlife Service
JC Watts Federal Building
330 West Broadway, Room 265
Frankfort, KY 40601

Ms. Stephanie Hayes
Kentucky Energy & Environment Cabinet
Division of Water
300 Sower Boulevard, 3rd Floor
Frankfort, KY 40601

Mr. Craig Potts
Executive Director
State Historic Preservation Officer
Kentucky Heritage Council
300 Washington Street
Frankfort, KY 40601

Mr. Gregory Johnson, Commissioner
Kentucky Department of Fish and Wildlife Resources
#1 Sportsman's Lane
Frankfort, KY 40601

GENERAL CONDITIONS:

1. Discharges of dredged or fill material into "waters of the U.S." must be minimized or avoided to the maximum extent practicable at the project site (i.e. on-site). In determining the minimal impact threshold, the Districts will consider the direct, secondary, and cumulative impacts of the fill or work and any mitigation measures.

2. The permittee shall provide a mitigation/monitoring plan for impacts resulting from the placement of fill into "waters of the U.S." in excess of 300 linear feet of intermittent or perennial stream; the filling of greater than 0.10 acre (4,356 sq. feet) of waters of the U.S; or work causing more than minimal effects, to compensate for impacts to the "waters of the U.S." These impact thresholds are applied for each crossing. When mitigation is required, the permittee will develop the mitigation site concurrently with, or in advance of, the site construction unless the Corps determines on a project specific basis that it is not practical to do so. This will ensure that aquatic functions are not lost for long periods of time (e.g. temporal loss) which could adversely affect water quality and wildlife. The requirement for conservation easements or deed restrictions will be determined on a project specific basis.

3. The permittee shall ensure that sedimentation and soil erosion control measures are in place prior to commencement of construction activities. These measures will remain in place and be properly maintained throughout construction. Sedimentation and soil control measures shall include the installation of straw bale barriers, silt fencing and/or other approved methods to control sedimentation and erosion. Sedimentation and erosion controls will not be placed in "waters of the U.S." except if specifically approved by the District.

4. The permittee shall ensure that areas disturbed by any construction activity, including channel and stream banks, are immediately stabilized and revegetated with a combination of non-invasive plants (grasses, legumes and shrubs) which are compatible with the affected area and will not compete with native vegetation.

5. The permittee shall ensure that no in-stream construction activity is performed during periods of high stream flow or during the fish spawning season (April 1 through June 30) without first contacting the Kentucky Department of Fish and Wildlife Resources (KDFWR) for their expertise on impacts to the fishery resource. Additionally, the discharge of dredged and/or fill material in known waterfowl breeding and wintering areas must be avoided to the maximum extent practicable.

6. The permittee will ensure that the activity authorized will not disrupt movement of those aquatic species indigenous to the waterbody, including those species which normally migrate through the area, unless the activity's specific purpose is to impound water.

7. The permittee shall ensure that all construction equipment is refueled and maintained on an upland site away from existing streams, drainageways and wetland areas. Heavy equipment working in wetlands must be placed on mats or other measures must be taken to minimize soil disturbance.

8. The permittee must comply with any case specific special conditions added by the Corps or by the State Section 401 Water Quality Certification (WQC). The conditions imposed in the State Section 401 WQC are also conditions of this LOP.

9. The permittee shall ensure that no activity authorized by the LOP may cause more than a minimal adverse effect on navigation.

10. The permittee shall ensure proper maintenance of any structure or fill authorized by the LOP, in good condition and in conformance with the terms and conditions of the LOP, including maintenance to ensure public safety. The permittee is not relieved of this requirement if the permitted activity is abandoned, although the permittee may make a good faith transfer to a third party. Should the permittee wish to cease to maintain the authorized activity or desire to abandon it without a good faith transfer, the permittee must obtain a modification to the LOP from the Corps, which may require restoration of the area.

11. The permittee shall not perform any work within any Wild and Scenic Rivers or in any river officially designated as a "study river" for possible inclusion in the system, unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity authorized by the LOP 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 in the area (e.g. U.S. Forest Service, Bureau of Land Management, the National Parks Service, or the U.S. Fish and Wildlife Service).

12. The permittee shall not perform any work under the LOP which is likely to 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, or which is likely to destroy or adversely modify the critical habitat of such species. The permittee shall notify the Corps and coordinate the proposed action with the USFWS to determine if any listed species or critical habitat might be affected and/or adversely modified by the proposed work. No activity is authorized under the LOP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed. At the direction of the Corps, the permittee shall complete the necessary consultation with the USFWS, satisfying the requirements of Section 7(a)(2) of the Endangered Species Act. The permittee shall not begin work until notified by the District Engineer that the requirements of the Endangered Species Act have been satisfied and that the activity is authorized. Authorization of an activity under the LOP does not authorize the "take" of a threatened or endangered species as defined under the Federal Endangered Species Act. 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. Fish and Wildlife Service, both lethal and non-lethal "takes" of protected species are in violation of the Endangered Species Act.

Obligations under Section 7 of the Act must be reconsidered by the Corps Districts if (1) new information reveals impacts of the proposed action may affect listed species or critical habitat in a manner not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered during consultation, or (3) new species are listed or critical habitat designated that might be affected

by the proposed action.

13. The permittee shall not perform any activity under the LOP which may affect historic properties listed, or eligible for listing, in the National Register of Historic Places until the District Engineer has complied with the provisions of 33 CFR Part 325, Appendix C. The permittee must notify the District Engineer if the activity authorized by the LOP may affect any historic properties listed, determined to be eligible or which the permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not begin construction until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the Kentucky Heritage Council.

If the permittee discovers any previously unknown historic or archaeological remains while accomplishing the activity authorized by the LOP, work must be immediately stopped and this office immediately notified regarding the discovery. The District will initiate the Federal, Tribal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

14. The permittee shall not perform any work under the LOP where the discharge of dredged and/or fill material will occur in the proximity of a public water supply intake.

15. No activity, including structures or work in "waters of the U.S." or discharges of dredged or fill material may consist of unsuitable materials (e.g. trash, debris, car bodies, asphalt, etc.) and that materials used for construction or discharge must be free from toxic pollutants in toxic amounts.

16. The permittee shall, to the maximum extent practicable, design the project to maintain pre-construction downstream flow conditions. Furthermore, the work must not permanently restrict or impede the passage of normal or expected high flows and the structure or discharge of fill must withstand expected high flows. The project must provide, to the maximum extent practicable, for retaining excess flows from the site and for establishing flow rates from the site similar to pre-construction conditions.

17. The permittee shall ensure that all temporary fills, authorized under the LOP, be removed in their entirety and the affected areas returned to pre-construction elevation.

18. Representatives from the Corps of Engineers and/or the State of Kentucky may inspect any authorized activity or mitigation site at any time deemed necessary to ensure compliance with the terms and conditions of the LOP, Section 401 WQC, and applicable laws.

19. All work authorized by this LOP must be completed within five years after the date of the Corps authorization letter. If you find you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least three months before the expiration date.

20. The permittee, after completion of work under the LOP, shall submit a signed certification letter regarding the completed work and required mitigation, if applicable. The certification letter will include a statement that the work was done in accordance with the LOP authorization including compliance with all general and special conditions and completion of mitigation work.

21. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished with the terms and conditions of the LOP.

22. For Section 10 waters, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work 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.

MATTHEW G. BEVIN
GOVERNOR

CHARLES G. SNAVELY
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

AARON B. KEATLEY
COMMISSIONER

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601

December 1, 2017

David Waldner
Kentucky Transportation Cabinet (KYTC)
200 Mero St
Frankfort, KY 40622

Re: Letter of Permission No.: 2017-069-7
AI No.: 96587; Activity ID: APE20170001
KY-237
KYTC Item No.: 6-8001.21
USACE ID No.: LRL-2017-687-ncc
Unnamed Tributaries to South Fork Gunpowder Creek, Unnamed Tributaries to Gunpowder Creek, Gunpowder Creek, and Wetlands
Boone, Kentucky

Dear Mr. Waldner:

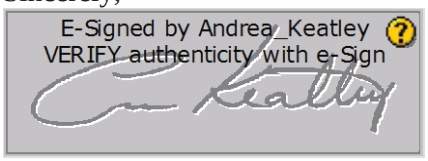
This letter transmits to you a copy of our General Water Quality Certification for the Letter of Permission Authorizing Transportation Projects for the Kentucky Transportation Cabinet – Kentucky Highway 237 Reconstruction and Widening Project in Boone, County, Kentucky, in accordance with plans included in the "Application for Permit to Construct Across or Along a Stream and/or Water Quality Certification" received October 6, 2017, including impacts to 766 linear feet of ephemeral stream, 1,487 linear feet of intermittent stream, 515 linear feet of perennial stream, 0.89 acres of open water, and 0.92 acres of wetland. Compensatory mitigation will be accomplished through purchasing 2579 stream AMUs from KYTC Beaver Creek Mitigation Bank and 1.8 wetland AMUs from KYTC Batch County Mitigation Bank. A copy of the receipt shall be submitted to the 401 Water Quality Certification Section prior to the start of construction.

An individual Water Quality Certification is not necessary for this activity provided that this project has satisfies the Transportation Letter of Permission from the U.S. Army Corps of Engineers (Letter of Permission for Transportation Projects, Corps ID No. LRL-2006-259, issued October 03, 2007 and revised October 28, 2010) and all conditions of the attached General Water Quality Certification - Letter of Permission Authorizing Transportation Projects are met.

Although an Individual WQC is not needed, other permits from the Division of Water may be required. If the project will disturb one acre or more of land, or is part of a larger common plan of development or sale that will ultimately disturb one acre or more of land, a Kentucky Pollution Discharge Elimination System (KPDES) stormwater permit shall be required from the Surface Water Permits Branch. This permit requires the development of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP must include erosion prevention and sediment control measures. Contact: Surface Water Permits Branch (SWPB) Support (502-564-3410 or SWPBSupport@ky.gov)

All future correspondence on this project must reference **AI No. 96587**. If you should have any questions concerning this letter, please contact Samantha Vogeler of my staff, at (502) 782-6995 or Samantha.Vogeler@ky.gov.

Sincerely,



Andrea Keatley, Manager
Water Quality Branch
Kentucky Division of Water

Attachment

cc: John Purdy, KYTC: Frankfort (via email: JPURDY@ky.gov)
Danny Peake, KYTC: Frankfort (via email: Danny.Peake@ky.gov)
Dave Harmon, KYTC: Frankfort (via email: Dave.Harmon@ky.gov)
Norma Condra, USACE: Louisville (via email: Norma.C.Condra@usace.army.mil)
Lee Andrews, USFWS: Frankfort (via email: Teresa_Hyatt@fws.gov)
Danielle Rogers, Licking River Basin Coordinator (via email: Danielle.Rogers@ky.gov)
Contractors
Richard Clausen, Redwing Ecological Services (via email: rclausen@redwingeco.com)

Kentucky Transportation Cabinet

Highway District 6

And

_____(2), Construction

Kentucky Pollutant Discharge Elimination System
Permit KYR10
Best Management Practices (BMP) plan

Groundwater protection plan

For Highway Construction Activities

For

KY 237 Boone County
M.P. 2.251 - 5.370

Project: PCN ## -
Item 06-8001.21

KyTC BMP Plan for Project PCN ## -

Project information

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

1. Owner – Kentucky Transportation Cabinet, District 6

2. Resident Engineer: (2)

3. Contractor name: (2)
   Address: (2)

   Phone number: (2)
   Contact: (2)
   Contractors agent responsible for compliance with the KPDES permit requirements (3):

4. Project Control Number (2)

5. Route (Address) KY 237 In Boone County

6. Latitude/Longitude (project mid-point) dd/mm/ss, dd/mm/ss
   38 degrees 59’ 18.168” N, 84 degrees 41’ 43.368” W

7. County (project mid-point) Boone County

8. Project start date (date work will begin): (2)

9. Projected completion date: (2)

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

A. Site description:

1. Nature of Construction Activity (from letting project description) Reconstruction/re-alignment of KY 237 from MP 2.251 – 5.370

2. Order of major soil disturbing activities (2) and (3)

3. Projected volume of material to be moved 60,000 Cubic Yards of Borrow

4. Estimate of total project area (acres) 81 Acres

5. Estimate of area to be disturbed (acres) 81 Acres

6. Post construction runoff coefficient will be included in the project drainage folder. Persons needing information pertaining to the runoff coefficient will contact the resident engineer to request this information.

7. Data describing existing soil condition (2)

8. Data describing existing discharge water quality (if any) (2)

9. Receiving water name Gunpowder Creek, South Fork Gunpowder Creek

10. TMDLs and Pollutants of Concern in Receiving Waters: (1 DEA)

11. Site map – Project layout sheet plus the erosion control sheets in the project plans that depict Disturbed Drainage Areas (DDAs) and related information. These sheets depict the existing project conditions with areas delineated by DDA (drainage area bounded by watershed breaks and right of way limits), the storm water discharge locations (either as a point discharge or as overland flow) and the areas that drain to each discharge point. These plans define the limits of areas to be disturbed and the location of control measures. Controls will be either site specific as designated by the designer or will be annotated by the contractor and resident engineer before disturbance commences. The project layout sheet shows the surface waters and wetlands.

12. Potential sources of pollutants:

The primary source of pollutants is solids that are mobilized during storm events. Other sources of pollutants include oil/fuel/grease from servicing and operating construction equipment, concrete washout water, sanitary wastes and trash/debris. (3)

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. <u>All DDA’s will have adequate BMP’s in place before being disturbed.</u>

3. As DDAs are prepared for construction, the following will be addressed for the project as a whole or for each DDA as appropriate:

   - Construction Access – This is the first land-disturbing activity. As soon as construction begins, bare areas will be stabilized with gravel and temporary mulch and/or vegetation.
   - At the beginning of the project, all DDAs for the project will be inspected for areas that are a source of storm water pollutants. Areas that are a source of pollutants will receive appropriate cover or BMPs to arrest the introduction of pollutants into storm water. Areas that have not been opened by the contractor will be inspected periodically (once per month) to determine if there is a need to employ BMPs to keep pollutants from entering storm water.

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

- Permanent Seeding and Protection
- Placing Sod
- Planting trees and/or shrubs where they are included in the project

➢ BMP's including Storm Water Management Devices such as velocity dissipation devices and Karst policy BMP's to be installed during construction to control the pollutants in storm water discharges that will occur after construction has been completed are : N/A

C. Other Control Measures

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

2. Waste Materials

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

3. Hazardous Waste

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

4. Spill Prevention

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

➢ **Good Housekeeping:**

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

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

➢ **Hazardous Products:**

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

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

The following product-specific practices will be followed onsite:

➢ **Petroleum Products:**

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

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

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

- **Fertilizers:**

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

- **Paints:**

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

- **Concrete Truck Washout:**

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

- **Spill Control Practices**

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

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

E. Maintenance

1. The BMP plan shall include a clear description of the maintenance procedures necessary to keep the control measures in good and effective operating condition.

- Maintenance of BMPs during construction shall be a result of weekly and post rain event inspections with action being taken by the contractor to correct deficiencies.

- Post Construction maintenance will be a function of normal highway maintenance operations. Following final project acceptance by the cabinet, district highway crews will be responsible for identification and correction of deficiencies regarding ground cover and cleaning of storm water BMPs. The project manager shall identify any BMPs that will be for the purpose of post construction storm water management with specific guidance for any non-routine maintenance.

F. Inspections

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

- 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

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 form 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 may be conducted as part of this construction project:

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

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

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

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

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

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

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

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

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

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

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

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

KyTC BMP Plan for Project PCN ## -

Contractor and Resident Engineer Plan certification

The contractor that is responsible for implementing this BMP plan is identified in the Project Information section of this plan.

The following certification applies to all parties that are signatory to this BMP plan:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Further, this plan complies with the requirements of 401 KAR 5:037. By this certification, the undersigned state that the individuals signing the plan have reviewed the terms of the plan and will implement its provisions as they pertain to ground water protection.

Resident Engineer and Contractor Certification:

(2) Resident Engineer signature

Signed _____title_____, _____
Typed or printed name[2] signature

(3) Signed _____title_____, _____
Typed or printed name[1] signature

1. Contractors Note: to be signed by a person who is the owner, a responsible corporate officer, a general partner or the proprietor or a person designated to have the authority to sign reports by such a person in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort Kentucky 40601. Reference the Project Control Number (PCN) and KPDES number when one has been issued.

2. KyTC note: to be signed by the Chief District Engineer or a person designated to have the authority to sign reports by such a person (usually the resident engineer) in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort Kentucky 40601 Reference the Project Control Number (PCN) and KPDES number when one has been issued.

Sub-Contractor Certification

The following sub-contractor shall be made aware of the BMP plan and responsible for implementation of BMPs identified in this plan as follows:

Subcontractor

Name:
Address:
Address:

Phone:

The part of BMP plan this subcontractor is responsible to implement is:

I certify under penalty of law that I understand the terms and conditions of the general Kentucky Pollutant Discharge Elimination System permit that authorizes the storm water discharges, the BMP plan that has been developed to manage the quality of water to be discharged as a result of storm events associated with the construction site activity and management of non-storm water pollutant sources identified as part of this certification.

Signed _____title_____, _____
Typed or printed name[1] signature

1. Sub Contractor Note: to be signed by a person who is the owner, a responsible corporate officer, a general partner or the proprietor or a person designated to have the authority to sign reports by such a person in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort Kentucky 40601. Reference the Project Control Number (PCN) and KPDES number when one has been issued.

SPECIAL NOTE

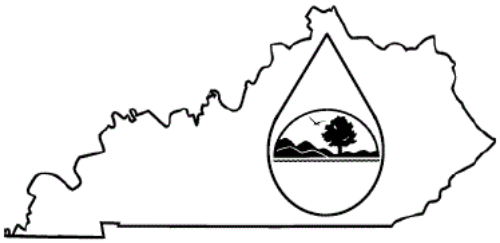
Filing of eNOI for KPDES Construction Stormwater Permit

County: Boone **Route: KY 36**
Item No.: 6-8001.21 **KDOW Submittal ID:** f3e57318-c79d-4901-8670-8fbd8c41546d

Project Description: KY 237 Reconstruction

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

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



KENTUCKY POLLUTION DISCHARGE ELIMINATION SYSTEM (KPDES)

Notice of Intent (NOI) for coverage of Storm Water Discharge Associated with Construction Activities Under the KPDES Storm Water General Permit KYR100000

Click here for Instructions (Controls/KPDES_FormKYR10_Instructions.htm)

Click here to obtain information and a copy of the KPDES General Permit. (http://dep.ky.gov/formslibrary/Documents/KYR10PermitPage.pdf)

(*) indicates a required field; (✓) indicates a field may be required based on user input or is an optionally required field

Reason for Submittal:(*)	Agency Interest ID:	Permit Number:(✓)
Application for New Permit Coverage	Agency Interest ID	KPDES Permit Number

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

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

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

SECTION I -- FACILITY OPERATOR INFORMATION (PERMITTEE)

Company Name:(✓)	First Name:(✓)	M.I.:	Last Name:(✓)
KYTC District 6	Robert	MI	Franxman

Mailing Address:(*)	City:(*)	State:(*)	Zip:(*)
421 Buttermilk Pike	Covington	Kentucky	41017

eMail Address:(*)	Business Phone:(*)	Alternate Phone:
robert.franxman@ky.gov	8593412700	Phone

SECTION II -- GENERAL SITE LOCATION INFORMATION

Project Name:(*)	Status of Owner/Operator(*)	SIC Code(*)
KY 237 Reconstruction	State Government	1611 Highway and Street Const

Company Name:(✓)	First Name:(✓)	M.I.:	Last Name:(✓)
Kentucky Transportation Cabinet	Robert	MI	Franxman

Site Physical Address:(*)
7839 Pleasant Valley Road

City:(*)	State:(*)	Zip:(*)
Burlington	Kentucky	41005

County:(*)	Latitude(decimal degrees)(*)DMS to DD Converter (https://www.fcc.gov/media/radio/dms-decimal)	Longitude(decimal degrees)(*)
Boone	38.98838	-84.69538

SECTION III -- SPECIFIC SITE ACTIVITY INFORMATION

Project Description:(*)
KY 237 Reconstruction

a. For single projects provide the following information

Total Number of Acres in Project:(✓)	Total Number of Acres Disturbed:(✓)
81	81
Anticipated Start Date:(✓)	**Anticipated Completion Date:(✓)**
9/3/2018	11/15/2021

b. For common plans of development provide the following information

Total Number of Acres in Project:(✓)	Total Number of Acres Disturbed:(✓)
# Acre(s)	# Acre(s)
Number of individual lots in development, if applicable:(✓)	**Number of lots in development:(✓)**
# lot(s)	# lot(s)
Total acreage of lots intended to be developed:(✓)	**Number of acres intended to be disturbed at any one time:(✓)**
Project Acres	Disturbed Acres
Anticipated Start Date:(✓)	**Anticipated Completion Date:(✓)**

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

	Company Name	
+		

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

Discharge Point(s):

	Unnamed Tributary?	Latitude	Longitude	Receiving Water Name	
1		38.992615	-84.696471	Gunpowder Creek	Delete
2		38.995487	-84.697488	Gunpowder Creek	Delete
3		38.995945	-84.699178	Gunpowder Creek	Delete
4		38.996067	-84.698040	Gunpowder Creek	Delete
5		38.996097	-84.699345	Gunpowder Creek	Delete
6		38.996235	-84.698331	Gunpowder Creek	Delete
7		38.999624	-84.700502	Gunpowder Creek	Delete
8		39.001210	-84.700759	Gunpowder Creek	Delete
9		39.005177	-84.703059	Gunpowder Creek	Delete
10		38.979878	-84.672551	South Fork Gunpowder Creek	Delete

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

Name of MS4:

Date of application/notification to the MS4 for construction site permit coverage:	Discharge Point(s):(*)
Date	

	Latitude	Longitude	
+			

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

Will the project require construction activities in a water body or the riparian zone?: (*)	Yes
If Yes, describe scope of activity: (✓)	Bridge Replacement
Is a Clean Water Act 404 permit required?:(*)	Yes

Is a Clean Water Act 401 Water Quality Certification required?:(*)	Yes

SECTION VII -- NOI PREPARER INFORMATION

First Name:(*)	M.I.:	Last Name:(*)	Company Name:(*)
Mike	MI	Bezold	KYTC District 6

Mailing Address:(*)	City:(*)	State:(*)	Zip:(*)
mike.bezold@ky.gov	Covington	Kentucky	41017

eMail Address:(*)	Business Phone:(*)	Alternate Phone:
mike.bezold@ky.gov	8593412700	Phone

SECTION VIII -- ATTACHMENTS

Facility Location Map:(*)	Upload file
Supplemental Information:	Upload file

SECTION IX -- CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature:(*)	Title:(*)
Signature	Title

First Name:(*)	M.I.:	Last Name:(*)
Mike	MI	Bezold

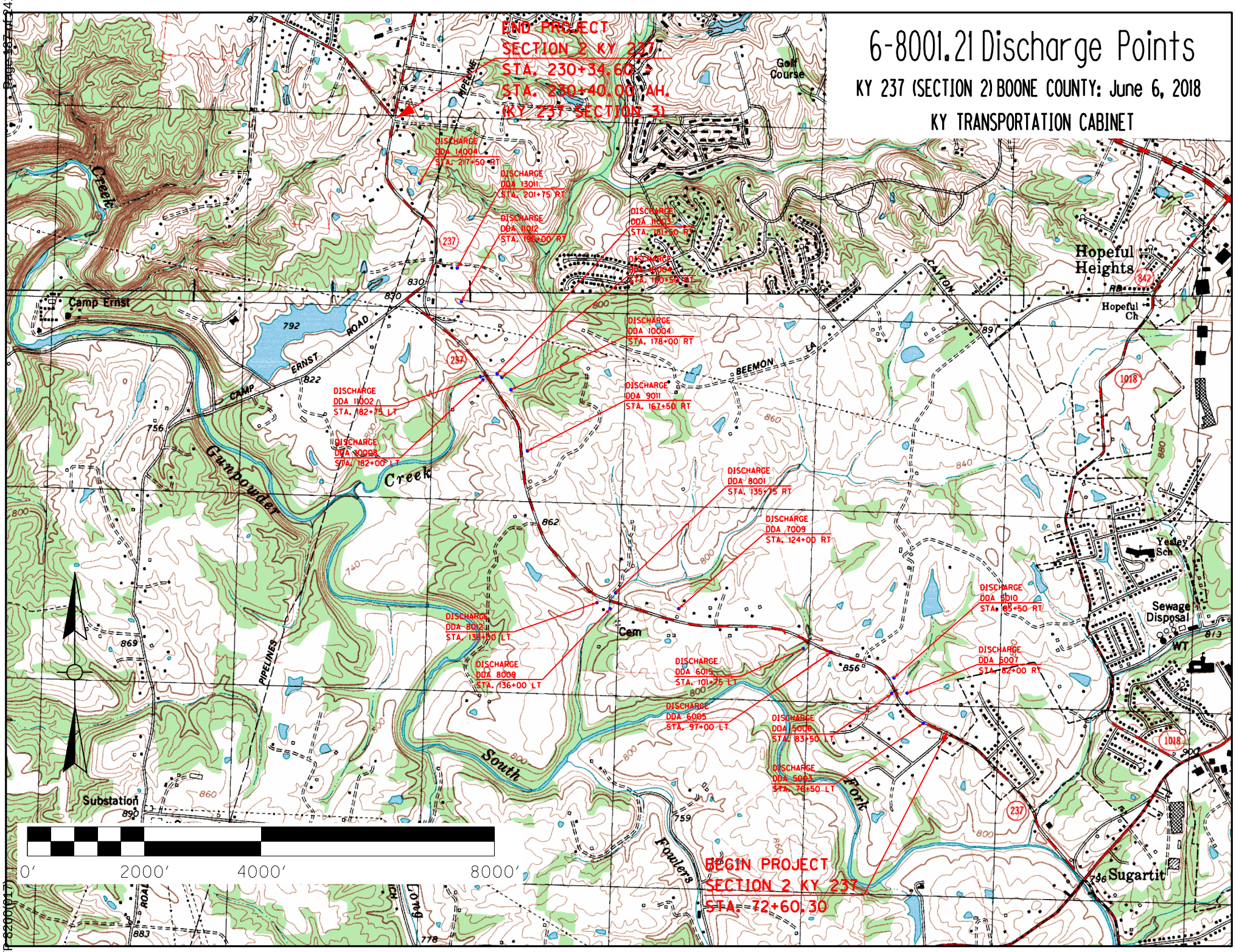
eMail Address:(*)	Business Phone:(*)	Alternate Phone:	Signature Date:(*)
eMail Address	Phone	Phone	Date

Click to Save Values for Future Retrieval | Click to Submit to EEC

6-8001.21 Discharge Points

KY 237 (SECTION 2) BOONE COUNTY: June 6, 2018

KY TRANSPORTATION CABINET



KENTUCKY TRANSPORTATION CABINET
COMMUNICATING ALL PROMISES (CAP)
ACTIVE

Item No. 6 - 8001.21 **Project Mgr.** kytc\Carol.Callan-Ramler

County BOONE **Route** KY-237

CAP #	Date of Promise	Promise made to:	Location of Promise
1	15-DEC-16	Carol Callan-Ramler & K. McDonald	District 6

CAP Description

Parcel 127: per MOU with property owner - compensation includes concrete drive and concrete pad. "All parking pads and driveway will be a minimum 6 inches thick and rebar reinforced". These shall be provided to match pre-existing dimensions and composition. A drawing was provided in the MOU.

2	10-DEC-15	Carol Callan-Ramler & Tim Flynn	District 6

CAP Description

Parcel 57: per MOU with property owner - State agrees not to disturb Plank Fencing, Blue Spruce and Cedar Trees located on top of hill along the subject property's road frontage and property owner has not received compensation for such items.

3	05-FEB-18	Carol Callan-Ramler & Tim Flynn	District Six

CAP Description

Parcel 58: per MOU with property owner - Drainage outlet located on east side od driveway at approximate station 75+00.00 to be reconnected at time of construction. State agrees to sod the disturbed areas of subject's front yard at no expense to property owner. Consideration includes compensation for two brick pillars with lantern lights on driveway and one large maple tree in front yard.

4	31-OCT-17	Carol Callan-Ramler & Tim Flynn	District Six

CAP Description

Parcel 59: per MOU with property owner - State agrees to allow property owner to salvage (due to $0.00 salvage value of said barn) all or any portion of subject parcel's barn up until 03/01/2018, at which time the state retains possession of said barn and shall raze said barn. State agrees to install 24' entrance to the subject parcel due to multi-owner access. Consideration includes compensation for fencing to secure affected boundary fencing and for temporary fencing that will have to be installed by owner around temporary easement during construction.

5	07-DEC-15	Carol Callan-Ramler & Tim Flynn	District Six

CAP Description

Parcel 79: per MOU with property owner - State agrees to extend existing 15' storm water drainage pipe under driveway an additional 24' east, approximately left of station 84 +76.00 to station 85+00. Included in the consideration is compensation for landscaping consisting of Stone Pavers, Decorative Gravel, 1 Flowering Ornamental Cherry Tree, 8 bushes, 2 Entrance Posts and Perennial Plants.

6	31-OCT-17	Carol Callan-Ramler & Tim Flynn	District Six

CAP Description

Parcel 80: per MOU with property owner - State agrees to sod any of the disturbed areas of the subject's front yard.

7	19-DEC-16	Carol Callan-Ramler & Tim Flynn	District Six

CAP Description

Parcel 84: per MOU with property owner - Disturbed areas that are not paved will be replaced with sod.

8	22-AUG-16	Carol Callan-Ramler & Tim Flynn	District Six

CAP Description

Parcel 85: per MOU with property owner - State agrees to sod the disturbed areas of subject's front and side yard at no expense to property owner and in a good and workmanlike manner. Consideration includes compensation for 4 large evergreen trees, 3 ornamental trees, 3 large shade (maple/oak) trees and drip irrigation system.

Item No. 6 8001.21 **Project Mgr.** kytc\Carol.Callan-Ramle

9	22-SEP-17	Carol Callan-Ramler & T	District Six

CAP Description
Parcel 87: per MOU with property owner - State agrees to install a 16' entrance way into the subject property at approximately

10	23-FEB-16	Carol Callan-Ramler & T	District Six

CAP Description
Parcel 88: per MOU with property owner - Consideration includes compensation for 1 large evergreen tree, 1 large cedar tree, subject's front yard and remove said trees during construction at no cost to property owner.

11	11-JAN-16	Carol Callan-Ramler & T	District Six

CAP Description
Parcel 89: per MOU with property owner - State agrees to sod the disturbed areas of the subject's front and side yards at no e
1 Small Maple Tree.

12	27-JUN-16	Carol Callan-Ramler & T	District Six

CAP Description
Parcel 91: per MOU with property owner - Compensation included for sign and landscaping. The Kentucky Transportation Cab
property line. Foundation drain from house drains to within 11 feet of the existing roadway near station 994+00.

13	08-JUL-16	Carol Callan-Ramler & T	District Six

CAP Description
Parcel 92: per MOU with property owner - The Transportation Cabinet will change the plans from the current open drainage dit

14	13-MAR-17	Carol Callan-Ramler & T	District Six

CAP Description
Parcel 93: per MOU with property owner - Included in the consideration is compensation for 3 large pine trees in front yard.

15	01-JUN-16	Carol Callan-Ramler & T	District Six

CAP Description
Parcel 96: per MOU with property owner - Compensation for trees included.

16	31-OCT-17	Carol Callan-Ramler & T	District Six

CAP Description
Parcel 98: per MOU with property owner - State agrees to install an entrance off of the proposed 24' entrance way into the sub
4:1 grade on proposed roadway back slopes.

17	22-SEP-17	Carol Callan-Ramler & T	District Six

CAP Description
Parcel 101: per MOU with property owner - State agrees to install a 24' entrance way into the subject property as depicted on t
limits.

18	03-FEB-16	Carol Callan-Ramler & T	District 6

CAP Description
Parcel 102: per MOU with property owner - State agrees to sod the disturbed area of subject's front yard at no expense to pro

19	25-SEP-17	Carol Callan-Ramler & T	District 6

CAP Description
Parcel 103: per MOU with property owner - State agrees to install an entrance ramp off of the proposed 24' entrance way into t

20	22-SEP-17	Carol Callan-Ramler & T	District 6

CAP Description
Parcel 104: per MOU with property owner - State agrees to sod any disturbed areas in the subject's front yard

Item No. 6 8001.21 **Project Mgr.** kytc\Carol.Callan-Ramle

21 14-JUL-17 Carol Callan-Ramler & T District 6

CAP Description

Parcel 105. per MOU with property owner - State agrees to sod the disturbed area of subject's front and side yard.

22 28-APR-16 Carol Callan-Ramler & T District 6

CAP Description

Parcel 106. per MOU with property owner - State agrees to sod the disturbed areas of the subject's front yard.

23 14-DEC-15 Carol Callan-Ramler & T District 6

CAP Description

Parcel 107. per MOU with property owner - State agrees to sod the disturbed areas of subject's front yard

24 08-SEP-16 Carol Callan-Ramler & T District 6

CAP Description

Parcel 108. per MOU with property owner - State agrees not to install turnaround on east side of subject driveway

25 22-JAN-16 Carol Callan-Ramler & T District 6

CAP Description

Parcel 109. per MOU with property owner - State agrees to sod the disturbed areas of subject's front yard

26 17-OCT-16 Carol Callan-Ramler & T District 6

CAP Description

Parcel 111. per MOU with property owner - State agrees to remove 2 large trees in front of the house in the temporary easeme

27 23-DEC-15 Carol Callan-Ramler & T District 6

CAP Description

Parcel 112. per MOU with property owner - State agrees to sod the disturbed areas of the subject's front yard.

28 28-JAN-16 Carol Callan-Ramler & T District 6

CAP Description

Parcel 113 - per MOU with property owner - State agrees to sod the disturbed areas of subject's front yard and not to remove t

29 13-MAY-16 Carol Callan-Ramler & T District 6

CAP Description

Parcel 114 - per MOU with property owner - State agrees to sod the disturbed areas of the subject's front yard

PART II

SPECIFICATIONS AND STANDARD DRAWINGS

SPECIFICATIONS REFERENCE

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

SUPPLEMENTAL SPECIFICATIONS

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

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

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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.

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

1I

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:

Code	Pay Item	Pay Unit
02671	Portable Changeable Message Sign	Each

Effective June 15, 2012

11F

SPECIAL NOTE FOR TURF REINFORCING MAT

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

2.0 MATERIALS.

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

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

2.2 Classifications

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

11F

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.
[2]Minimum Average Roll Values for tensile strength of sample material machine direction.
[3]Tensile Strength percentage retained after stated 1000 hr duration of exposure under ASTM D4355 testing. Based on nondegradable components exclusively.
[4]Maximum permissible shear design values based on short-term (0.5 hr) vegetated data obtained by full scale flume testing ASTM D6459, D6460-07. Based on nondegradable components exclusively. Testing will be done at Independent Hydraulics Facility such as Colorado State University hydraulics laboratory, Utah State University hydraulics laboratory, Texas Transportation Institute (TTI) hydraulics and erosion control laboratory.

2.3 Quality Assurance Sampling, Testing, and Acceptance

A) Provide TRM listed on the Department's List of Approved Materials. Prior to inclusion on the LAM, the manufacturer of TRM must meet the physical and performance criteria as outlined in the specification and submit a Letter Certifying compliance of the product under the above ASTM testing procedures and including a copy of report from Full Scale Independent Hydraulics Facility that Fully Vegetated Shear Stress meets shear stress requirements tested under D6459 and D6460-07.

B) Contractors will provide a Letter of Certification from Manufacturer stating the product name, manufacturer, and that the product MARV product unit testing results meets Department criteria. Provide Letters once per project and for each product.

C) Acceptance shall be in accordance with ASTM D-4759 based on testing performed by a Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP) accredited laboratory using Procedure A of ASTM D-4354.

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

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

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

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

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

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

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

Code	Pay Item	Pay Unit
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

SPECIAL PROVISION FOR EMBANKMENT AT BRIDGE END BENT STRUCTURES

This Special Provision will apply when indicated on the plans or in the proposal. Section references herein are to the Department's Standard Specifications for Road and Bridge Construction, Current Edition.

1.0 DESCRIPTION. Construct a soil, granular, or rock embankment with soil, granular or cohesive pile core and place structure granular backfill, as the Plans require. Construct the embankment according to the requirements of this Special Provision, the Plans, Standard Drawing RGX 100 and 105, and the Standard Specifications, Current Edition.

2.0 MATERIALS.

2.1 Granular Embankment. Conform to Subsection 805.10. When Granular Embankment materials are erodible or unstable according to Subsection 805.03.04, use the Special Construction Methods found in 3.2 of the Special Provision.

2.2 Rock Embankment. Provide durable rock from roadway excavation that consists principally of Unweathered Limestone, Durable Shale (SDI equal to or greater than 95 according to KM 64-513), or Durable Sandstone.

2.3 Pile Core. Provide a pile core in the area of the embankments where deep foundations are to be installed unless otherwise specified. The Pile Core is the zone indicated on Standard Drawings RGX 100 and 105 designated as Pile Core. Material control of the pile core area during embankment construction is always required. Proper Pile Core construction is required for installation of foundation elements such as drilled or driven piles or drilled shafts. The type of material used to construct the pile core is as directed in the plans or below. Typically, the pile core area will be constructed from the same material used to construct the surrounding embankment. Pile Core can be classified as one of three types:

A) Pile Core - Conform to Section 206 of the Standard Specifications. Provide pile core material consisting of the same material as the adjacent embankment except the material in the pile core area shall be free of boulders or particle sizes larger than 4 inches in any dimension or any other obstructions that may hinder pile driving operations. If the pile core material hinders pile driving operations, take the appropriate means necessary to reach the required pile tip elevation, at no expense to the Department.

B) Granular Pile Core. Granular pile core is required only when specified in the plans. Select a gradation of durable rock to facilitate pile driving that conforms to Subsection 805.11. If granular pile core material hinders pile driving operations, take appropriate means necessary to reach the required pile tip elevation, at no expense to the Department.

C) Cohesive Pile Core. Cohesive Pile Core is required only when specified in the plans. Conform to Section 206 of the Standard Specifications and use soil with at least 50 percent passing a No. 4 sieve having a minimum Plasticity Index (PI) of 10. In addition, keep the cohesive pile core free of boulders, larger than 4 inches in any dimension, or any other obstructions, which would interfere with drilling operations. If cohesive pile core material interferes with drilling operations, take appropriate means necessary to maintain

excavation stability, at no expense to the Department.

2.4 Structure Granular Backfill. Conform to Subsection 805.11

2.5 Geotextile Fabric. Conform to Type I or Type IV in Section 214 and 843.

3.0 CONSTRUCTION.

3.1 General. Construct roadway embankments at end bents according to Section 206 and in accordance with the Special Provision, the Plans, and Standard Drawings for the full embankment section. In some instances, granular or rock embankment will be required for embankment construction for stability purposes, but this special provision does not prevent the use of soil when appropriate. Refer to the plans for specific details regarding material requirements for embankment construction.

Place and compact the pile core and structure granular backfill according to the applicable density requirements for the project. If the embankment and pile core are dissimilar materials (i.e., a granular pile core is used with a soil embankment or a cohesive pile core is used with a granular embankment), a Geotextile Fabric, Type IV, will be required between the pile core and embankment in accordance with Sections 214 and 843 of the Standard Specifications.

When granular or rock embankment is required for embankment construction, conform to the general requirements of Subsection 206.03.02 B. In addition, place the material in no greater than 2-foot loose lifts and compact with a vibrating smooth wheel roller capable of producing a minimum centrifugal force of 15 tons. Apply these requirements to the full width of the embankment for a distance of half the embankment height or 50 feet, whichever is greater, as shown on Standard Drawing RGX-105.

When using granular pile core, install 8-inch perforated underdrain pipe at or near the elevation of the original ground in the approximate locations depicted on the standard drawing, and as the Engineer directs, to ensure positive drainage of the embankment. Wrap the perforated pipe with a fabric of a type recommended by the pipe manufacturer.

After constructing the embankment, excavate for the end bent cap, drive piling, install shafts or other foundation elements, place the mortar bed, construct the end bent, and complete the embankment to finish grade according to the construction sequence shown on the Plans or Standard Drawings and as specified hereinafter.

Certain projects may require widening of existing embankments and the removal of substructures. Construct embankment according to the plans. Substructure removal shall be completed according to the plans and Section 203. Excavation may be required at the existing embankment in order to place the structure granular backfill as shown in the Standard Drawings.

After piles are driven or shafts installed (see design drawings), slope the bottom of the excavation towards the ends of the trench as noted on the plans for drainage. Using a separate pour, place concrete mortar, or any class concrete, to provide a base for forming and placing the cap. Place side forms for the end bent after the mortar has set sufficiently to support workmen and forms without being disturbed.

Install 4-inch perforated pipe in accordance with the plans and Standard Drawings. In the event slope protection extends above the elevation of the perforated pipe, extend the pipe through the slope protection.

After placing the end bent cap and achieving required concrete cylinder strengths, remove adjacent forms and fill the excavation with compacted structure granular backfill material (maximum 1’ loose lifts) to the level of the berm prior to placing beams for the bridge. Place Type IV geotextile fabric between embankment material and structure granular backfill. After completing the end bent backwall, or after completing the span end

wall, place the compacted structure granular backfill (maximum 1' loose lifts) to subgrade elevation. If the original excavation is enlarged, fill the entire volume with compacted structure granular backfill (maximum 1' loose lifts) at no expense to the Department. Do not place backfill before removing adjacent form work. Place structure granular backfill material in trench ditches at the ends of the excavation. Place Geotextile Fabric, Type IV over the surface of the compacted structure granular backfill prior to placing aggregate base course.

Tamp the backfill with hand tampers, pneumatic tampers, or other means approved by the Engineer. Thoroughly compact the backfill under the overhanging portions of the structure to ensure that the backfill is in intimate contact with the sides of the structure.

Do not apply seeding, sodding, or other vegetation to the exposed granular embankment.

3.2 Special Construction Methods. Erodible or unstable materials may erode even when protected by riprap or channel lining; use the special construction method described below when using these materials.

Use fine aggregates or friable sandstone granular embankment at "dry land" structures only. Do not use them at stream crossings or locations subject to flood waters.

For erodible or unstable materials having 50 percent or more passing the No. 4 sieve, protect with geotextile fabric. Extend the fabric from the original ground to the top of slope over the entire area of the embankment slopes on each side of, and in front of, the end bent. Cover the fabric with at least 12 inches of non-erodible material.

For erodible or unstable materials having less than 50 percent passing a No. 4 sieve, cover with at least 12 inches of non-erodible material.

Where erodible or unstable granular embankment will be protected by riprap or channel lining, place Type IV geotextile fabric between the embankment and the specified slope protection.

4.0 MEASUREMENT.

4.1 Granular Embankment. The Department will measure the quantity in cubic yards using the plan quantity, increased or decreased by authorized adjustments as specified in Section 204. The Department will not measure for payment any Granular Embankment that is not called for in the plans.

The Department will not measure for payment any special construction caused by using erodible or unstable materials and will consider it incidental to the Granular Embankment regardless of whether the erodible or unstable material was specified or permitted.

4.2 Rock Embankment. The Department will not measure for payment any rock embankment and will consider it incidental to roadway excavation or embankment in place, as applicable. Rock embankments will be constructed using granular embankment on projects where there is no available rock present within the excavation limits of the project.

4.3 Pile Core. Pile core will be measured and paid under roadway excavation or embankment in place, as applicable. The Department will not measure the pile core for separate payment. The Department will not measure for payment the 8-inch perforated underdrain pipe and will consider it incidental to the Pile Core.

4.4 Structure Granular Backfill. The Department will measure the quantity in cubic yards using the plan quantity, increased or decreased by authorized adjustments as specified in Section 204. The Department will not measure any additional material required for backfill outside the limits shown on the Plans and Standard Drawings for payment and will

consider it incidental to the work.

The Department will not measure for payment the 4-inch perforated underdrain pipe and will consider it incidental to the Structure Granular Backfill.

4.5 Geotextile Fabric. The Department will not measure the quantity of fabric used for separating dissimilar materials when constructing the embankment and pile core and will consider it incidental to embankment construction.

The Department will not measure for payment the Geotextile Fabric used to separate the Structure Granular Backfill from the embankment and aggregate base course and will consider it incidental to Structure Granular Backfill.

The Department will not measure for payment the Geotextile Fabric required for construction with erodible or unstable materials and will consider it incidental to embankment construction.

4.6 End Bent. The Department will measure the quantities according to the Contract. The Department will not measure furnishing and placing the 2-inch mortar or concrete bed for payment and will consider it incidental to the end bent construction.

4.7 Structure Excavation. The Department will not measure structure excavation on new embankments for payment and will consider it incidental to the Structure Granular Backfill or Concrete as applicable.

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

Code	Pay Item	Pay Unit
02223	Granular Embankment	Cubic Yards
02231	Structure Granular Backfill	Cubic Yards

The Department will consider payment as full compensation for all work required in this provision.

September 16, 2016

PART III

EMPLOYMENT, WAGE AND RECORD REQUIREMENTS

FHWA-1273 -- Revised May 1, 2012

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION 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).

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.

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.

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).

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.

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.

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.

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 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.

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.

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.

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 contacting 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 (forty and above); or limit, segregate, or classify his employees in any way which would deprive or tend to deprive an individual of employment opportunities or otherwise adversely affect his status as an employee, because of such individual's race, color, religion, national origin, sex, disability or age forty (40) and over. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

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

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

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

Revised: January 25, 2017

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 (7) provides:

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

KRS 11A.040 (9) states:

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

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

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

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

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

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

Revised: January 27, 2017

General Decision Number: KY180101 08/17/2018 KY101

Superseded General Decision Number: KY20170101

State: Kentucky

Construction Type: Highway

Counties: Boone, Campbell, Kenton and Pendleton 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: Under Executive Order (EO) 13658, an hourly minimum wage of $10.35 for calendar year 2018 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was 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 $10.35 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2018. The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/05/2018
1	02/16/2018
2	04/20/2018
3	05/04/2018
4	06/01/2018
5	07/13/2018
6	08/17/2018

BRKY0002-005 06/01/2017

	Rates	Fringes
BRICKLAYER	$ 27.81	13.01

BROH0001-005 06/01/2008

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 25.75	8.60

CARP0698-001 05/01/2014

BOONE, CAMPBELL, KENTON & PENDLETON COUNTIES:

	Rates	Fringes
Carpenter & Piledrivermen	$ 27.27	14.59
Diver	$ 40.58	9.69

ELEC0212-007 06/04/2018

	Rates	Fringes
ELECTRICIAN	$ 28.39	18.98

ELEC0212-013 11/27/2017

	Rates	Fringes
Sound & Communication Technician	$ 23.55	11.26

ENGI0018-013 05/01/2015

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1	$ 33.34	14.25
GROUP 2	$ 33.22	14.25
GROUP 3	$ 32.18	14.25
GROUP 4	$ 31.00	14.24
GROUP 5	$ 25.54	14.25
GROUP 6	$ 33.59	14.25
GROUP 7	$ 33.84	14.25

OPERATING ENGINEER CLASSIFICATIONS

GROUP 1 - Air Compressor on Steel Erection; Barrier Moving Machine; Boiler Operator on Compressor or Generator when mounted on a Rig; Cableway; Combination Concrete Mixer & Tower; Concrete Plant (over 4 yd. Capacity); Concrete Pump; Crane (All Types, Including Boom Truck, Cherry Picker); Crane-Compact, Track or Rubber over 4,000 lbs. capacity; Cranes-Self Erecting, Stationary, Track or Truck (All Configurations); Derrick; Dragline; Dredge (Dipper, Clam or Suction); Elevating Grader or Euclid Loader; Floating Equipment (All Types); Gradall; Helicopter Crew (Operator-Hoist or Winch); Hoe (all types); Hoisting Engine on Shaft or Tunnel Work; Hydraulic Gantry (Lifting System); Industrial-Type Tractor; Jet Engine Dryer (D8 or D9) Diesel Tractor; Locomotive (Standard Gauge); Maintenance Operator Class A; Mixer, Paving (Single or Double Drum); Mucking Machine; Multiple Scraper; Piledriving Machine (All Types); Power Shovel; Prentice Loader; Quad 9 (Double Pusher); Rail Tamper (with auto lifting & aligning device); Refrigerating Machine (Freezer Operation); Rotary Drill, on Caisson work; Rough Terrain Fork Lift with Winch/Hoist; Side-Boom; Slip-Form Paver; Tower Derrick; Tree Shredder; Trench Machine (Over 24" wide); Truck Mounted Concrete Pump; Tug Boat; Tunnel Machine and/or Mining Machine; & Wheel Excavator

GROUP 2 - Asphalt Paver; Automatic Subgrader Machine, Self-Propelled (CMI Type); Bobcat Type and/or Skid Steer Loader with Hoe Attachment Greater than 7,000 lbs.; Boring Machine More than 48"; Bulldozer; Endloader; Hydro Milling Machine; Horizontal Directional Drill (over 500,000 ft. lbs. thrust); Kolman-type Loader (production type-Dirt); Lead Greaseman; Lighting & Traffic Signal Installation Equipment (includes all groups or classifications); Material Transfer Equipment (Shuttle Buggy) Asphalt; Pettibone-Rail Equipment; Power Grader; Power Scraper; Push Cat; Rotomill (all), Grinders & Planers of All types; Trench Machine (24" wide & under); & Vermeer type Concrete Saw

GROUP 3 - A-Frame; Air Compressor on Tunnel Work (low pressure); Asphalt Plant Engineer; Bobcat-type and/or Skid Steer Loader with or without Attachments; Highway Drills (all types); Locomotive (narrow gauge); Material Hoist/Elevator; Mixer, Concrete (more than one bag capacity); Mixer, one bag capacity (Side Loader); Power Boiler (Over 15 lbs. Pressure) Pump Operator installing & operating Well Points; Pump (4" & over discharge); Roller, Asphalt; Rotovator (lime soil stabilizer); Switch & Tie Tampers (without lifting & aligning device); Utility Operator (Small equipment); & Welding Machines

GROUP 4 - Backfiller; Ballast Re-locator; Bars, Joint & Mesh Installing Machine; Batch Plant; Boring Machine Operator (48" or less); Bull Floats; Burlap & Curing Machine; Concrete Plant (capacity 4 yd. & under); Concrete Saw (Multiple); Conveyor (Highway); Crusher; Deckhand; Farm-type Tractor with attachments (highway) except Masonry); Finishing Machine; Fireperson, Floating Equipment (all types); Fork Lift (highway); Form Trencher; Hydro Hammer; Hydro Seeder; Pavement Breaker; Plant Mixer; Post Driver; Post Hole Digger (Power Auger); Power Brush Burner; Power Form Handling Equipment; Road Widening Trencher; Roller (Brick, Grade & Macadam); Self-Propelled Power Spreader; Self-Propelled Power Subgrader; Steam Fireperson; Tractor (Pulling Sheepfoot, Roller or Grader); & Vibratory Compactor with Integral Power

GROUP 5 - Compressor (Portable, Sewer, Heavy & Highway); Drum Fireperson (Asphalt); Generator; Masonry Fork Lift; Inboard-Outboard Motor Boat Launch; Masonry Fork Lift; Oil Heater (asphalt plant); Oiler; Power Driven Heater; Power Sweeper & Scrubber; Pump (under 4" discharge); Signalperson; Tire Repairperson; & VAC/ALLS

GROUP 6 - Master Mechanic & Boom from 150 to 180

GROUP 7 - Boom from 180 and over

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* IRON0044-008 06/01/2018

	Rates	Fringes
Ironworkers:		

Fence Erector	$ 26.76	21.20
Structural	$ 28.17	21.20

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* IRON0044-018 06/01/2018

	Rates	Fringes
IRONWORKER, REINFORCING	$ 28.17	21.20

LABO0189-004 07/01/2017

PENDLETON COUNTY:

	Rates	Fringes
LABORER		
GROUP 1	$ 23.14	13.29
GROUP 2	$ 23.39	13.29
GROUP 3	$ 23.44	13.29
GROUP 4	$ 24.04	13.29

LABORERS 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; Bushammer; 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; 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 Driller (All Types); Powderman & Blaster; Troxler & Concrete Tester if Laborer is Utilized

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LABO0265-009 05/01/2018

BOONE, CAMPBELL & KENTON COUNTIES:

	Rates	Fringes
LABORER		
GROUP 1	$ 30.62	10.95
GROUP 2	$ 30.79	10.95
GROUP 3	$ 31.12	10.95
GROUP 4	$ 31.57	10.95

LABORER CLASSIFICATIONS

GROUP 1 - Asphalt Laborer; Carpenter Tender; Concrete Curing Applicator; Dump Man (Batch Truck); Guardrail and Fence Installer; Joint Setter; Laborer (Construction); Landscape Laborer; Highway Lighting Worker; Signalization Worker; Mesh Handlers & Placer; Right-of-way Laborer; Riprap Laborer & Grouter; Scaffold Erector; Seal Coating; Surface Treatment or Road Mix Laborer; Sign Installer; Slurry Seal; Utility Man; Bridge Man; Handyman; Waterproofing Laborer; Flagperson; Hazardous Waste (level D); Diver Tender; Zone Person & Traffic Control

GROUP 2 - Skid Steer; Asphalt Raker; Concrete Puddler; Kettle Man (Pipeline); Machine Driven Tools (Gas, Electric, Air); Mason Tender; Brick Paver; Mortar Mixer; Power Buggy or Power Wheelbarrow; Sheeting & Shoring Man; Surface Grinder Man; Plastic Fusing Machine Operator; Pug Mill Operator; & Vacuum Devices (wet or dry); Rodding Machine Operator; Diver; Screwman or Paver; Screed Person; Water Blast, Hand Held Wand; Pumps 4" & Under (Gas, Air or Electric) & Hazardous Waste (level C); Air Track and Wagon Drill; Bottom Person; Cofferdam (below 25 ft. deep); Concrete Saw Person; Cutting with Burning Torch; Form Setter; Hand Spiker (Railroad); Pipelayer; Tunnel Laborer (without air) & Caisson; Underground Person (working in Sewer and Waterline, Cleaning, Repairing & Reconditioning); Sandblaster Nozzle Person; & Hazardous Waste (level B)

GROUP 3 - Blaster; Mucker; Powder Person; Top Lander; Wrencher (Mechanical Joints & Utility Pipeline); Yarner; Hazardous Waste (level A); Concrete Specialist; Concrete Crew in Tunnels (With Air-pressurized - $1.00 premium); Curb Setter & Cutter; Grade Checker; Utility Pipeline Tapper; Waterline; and Caulker

GROUP 4 - Miner; & Gunite Nozzle Person

TUNNEL LABORER WITH AIR-PRESSURIZED ADD $1.00 TO BASE RATE

SIGNAL PERSON WILL RECEIVE THE RATE EQUAL TO THE RATE PAID THE LABORER CLASSIFICATION FOR WHICH HE OR SHE IS SIGNALING.

PAIN0012-016 05/01/2015

	Rates	Fringes
PAINTER		
Bridge	$ 24.39	9.06
Bridge Equipment Tender and Containment Builder	$ 20.73	9.06
Brush & Roller	$ 23.39	9.06
Sandblasting & Water Blasting	$ 24.14	9.06
Spray	$ 23.89	9.06

PLUM0392-008 06/01/2018

	Rates	Fringes
PLUMBER	$ 32.01	19.67

SUKY2010-161 02/05/1996

	Rates	Fringes
Truck drivers:		
GROUP 1	$ 15.85	4.60
GROUP 2	$ 16.29	4.60

TRUCK DRIVER CLASSIFICATIONS

GROUP 1 - Driver

GROUP 2 - Euclid Wagon; End Dump; Lowboy; Heavy Duty Equipment; Tractor-Trailer Combination; & Drag

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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

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.

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
11.0%	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 Boone 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

181033

PROPOSAL BID ITEMS

Report Date 9/18/18

Section: 0001 - PAVING-ALT #1

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00003		CRUSHED STONE BASE	51,649.00	TON		$	
0020	00008		CEMENT STABILIZED ROADBED	120,196.00	SQYD		$	
0030	00020		TRAFFIC BOUND BASE	152.00	TON		$	
0040	00100		ASPHALT SEAL AGGREGATE	24.60	TON		$	
0050	00103		ASPHALT SEAL COAT	3.00	TON		$	
0060	00214		CL3 ASPH BASE 1.00D PG64-22	70,136.00	TON		$	
0070	00356		ASPHALT MATERIAL FOR TACK	68.00	TON		$	
0080	00358		ASPHALT CURING SEAL	120.00	TON		$	
0090	00388		CL3 ASPH SURF 0.38B PG64-22	11,851.00	TON		$	
0100	01810		STANDARD CURB AND GUTTER	30,100.00	LF		$	
0110	02084		JPC PAVEMENT-8 IN	1,455.00	SQYD		$	
0120	02101		CEM CONC ENT PAVEMENT-8 IN	963.00	SQYD		$	
0130	02542		CEMENT	2,294.00	TON		$	
0140	02677		ASPHALT PAVE MILLING & TEXTURING	138.00	TON		$	
0150	02702		SAND FOR BLOTTER	301.00	TON		$	
0160	10020NS		FUEL ADJUSTMENT	205,212.00	DOLL	$1.00	$	$205,212.00
0170	10030NS		ASPHALT ADJUSTMENT	320,611.00	DOLL	$1.00	$	$320,611.00
0180	23379EC		STAMPED CONCRETE	425.00	SQYD		$	
0190	24779EC		INTELLIGENT COMPACTION FOR SOIL	242,795.00	CUYD		$	
0200	24780EC		INTELLIGENT COMPACTION FOR AGGREGATE	51,183.00	TON		$	
0210	24781EC		INTELLIGENT COMPACTION FOR ASPHALT	81,631.00	TON		$	
0220	24891EC		PAVE MOUNT INFRARED TEMP EQUIPMENT	1,857,132.00	SF		$	
0230	24990EC		INTELLIGENT COMP SUBGRADE STABILIZATION	120,196.00	SQYD		$	

Section: 0002 - PAVING- ALT #2

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0240	00003		CRUSHED STONE BASE	93,072.00	TON		$	
0250	00008		CEMENT STABILIZED ROADBED	120,145.00	SQYD		$	
0260	00020		TRAFFIC BOUND BASE	152.00	TON		$	
0270	00100		ASPHALT SEAL AGGREGATE	24.60	TON		$	
0280	00103		ASPHALT SEAL COAT	3.00	TON		$	
0290	00214		CL3 ASPH BASE 1.00D PG64-22	35,984.00	TON		$	
0300	00356		ASPHALT MATERIAL FOR TACK	44.00	TON		$	
0310	00358		ASPHALT CURING SEAL	120.00	TON		$	
0320	00388		CL3 ASPH SURF 0.38B PG64-22	11,851.00	TON		$	
0330	01810		STANDARD CURB AND GUTTER	30,100.00	LF		$	
0340	02084		JPC PAVEMENT-8 IN	1,455.00	SQYD		$	
0350	02101		CEM CONC ENT PAVEMENT-8 IN	963.00	SQYD		$	
0360	02542		CEMENT	2,293.00	TON		$	
0370	02677		ASPHALT PAVE MILLING & TEXTURING	138.00	TON		$	
0380	02702		SAND FOR BLOTTER	301.00	TON		$	
0390	10020NS		FUEL ADJUSTMENT	166,800.00	DOLL	$1.00	$	$166,800.00
0400	10030NS		ASPHALT ADJUSTMENT	187,090.00	DOLL	$1.00	$	$187,090.00

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0410	20263ED		GEOGRID REINFORCEMENT	120,145.00	SQYD		$	
0420	23379EC		STAMPED CONCRETE	425.00	SQYD		$	
0430	24779EC		INTELLIGENT COMPACTION FOR SOIL	242,795.00	CUYD		$	
0440	24780EC		INTELLIGENT COMPACTION FOR AGGREGATE	92,616.00	TON		$	
0450	24781EC		INTELLIGENT COMPACTION FOR ASPHALT	47,479.00	TON		$	
0460	24891EC		PAVE MOUNT INFRARED TEMP EQUIPMENT	1,857,132.00	SF		$	
0470	24990EC		INTELLIGENT COMP SUBGRADE STABILIZATION	120,145.00	SQYD		$	

Section: 0003 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0480	00021		DRAINAGE BLANKET-EMBANKMENT	3,137.00	CUYD		$	
0490	00078		CRUSHED AGGREGATE SIZE NO 2	2,287.00	TON		$	
0500	01000		PERFORATED PIPE-4 IN	33,722.00	LF		$	
0510	01010		NON-PERFORATED PIPE-4 IN	96.00	LF		$	
0520	01020		PERF PIPE HEADWALL TY 1-4 IN	1.00	EACH		$	
0530	01024		PERF PIPE HEADWALL TY 2-4 IN	2.00	EACH		$	
0540	01028		PERF PIPE HEADWALL TY 3-4 IN	4.00	EACH		$	
0550	01875		STANDARD HEADER CURB	1,852.00	LF		$	
0560	01890		ISLAND HEADER CURB TYPE 1	438.00	LF		$	
0570	02091		REMOVE PAVEMENT	1,346.00	SQYD		$	
0580	02159		TEMP DITCH	8,554.00	LF		$	
0590	02160		CLEAN TEMP DITCH	4,279.00	LF		$	
0600	02230		EMBANKMENT IN PLACE	273,799.00	CUYD		$	
0610	02242		WATER	648.00	MGAL		$	
0620	02274		FENCE-6 FT CHAIN LINK	842.00	LF		$	
0630	02287		DOUBLE VEHICULAR CHAIN LINK GATE	1.00	EACH		$	
0640	02351		GUARDRAIL-STEEL W BEAM-S FACE	5,412.50	LF		$	
0650	02360		GUARDRAIL TERMINAL SECTION NO 1	2.00	EACH		$	
0660	02363		GUARDRAIL CONNECTOR TO BRIDGE END TY A	4.00	EACH		$	
0670	02367		GUARDRAIL END TREATMENT TYPE 1	5.00	EACH		$	
0680	02381		REMOVE GUARDRAIL	50.00	LF		$	
0690	02391		GUARDRAIL END TREATMENT TYPE 4A	19.00	EACH		$	
0700	02429		RIGHT-OF-WAY MONUMENT TYPE 1	126.00	EACH		$	
0710	02432		WITNESS POST	3.00	EACH		$	
0720	02484		CHANNEL LINING CLASS III (REVISED: 9-18-18)	1,343.00	TON		$	
0730	02545		CLEARING AND GRUBBING 72.39 ACRES	1.00	LS		$	
0740	02562		TEMPORARY SIGNS	1,013.00	SQFT		$	
0750	02585		EDGE KEY	210.00	LF		$	
0760	02599		FABRIC-GEOTEXTILE TYPE IV	51,561.00	SQYD		$	
0770	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		$	
0780	02651		DIVERSIONS (BY-PASS DETOURS)	1.00	LS		$	
0790	02671		PORTABLE CHANGEABLE MESSAGE SIGN	4.00	EACH		$	
0800	02676		MOBILIZATION FOR MILL & TEXT	1.00	LS		$	
0810	02690		SAFELOADING	60.00	CUYD		$	

181033

PROPOSAL BID ITEMS

Report Date 9/18/18

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0820	02703		SILT TRAP TYPE A	72.00	EACH		$	
0830	02704		SILT TRAP TYPE B	72.00	EACH		$	
0840	02705		SILT TRAP TYPE C	72.00	EACH		$	
0850	02706		CLEAN SILT TRAP TYPE A	72.00	EACH		$	
0860	02707		CLEAN SILT TRAP TYPE B	72.00	EACH		$	
0870	02708		CLEAN SILT TRAP TYPE C	72.00	EACH		$	
0880	02720		SIDEWALK-4 IN CONCRETE	1,404.00	SQYD		$	
0890	02720		SIDEWALK-4 IN CONCRETE SPECIAL SIDEWALK (@ ROUNDABOUT SPLITTER ISLANDS)	526.00	SQYD		$	
0900	02726		STAKING	1.00	LS		$	
0910	02731		REMOVE STRUCTURE (EX. TRIPLE 14'X7' RCBC @ STA 183.00)	1.00	LS		$	
0920	02731		REMOVE STRUCTURE (STA. 136+42	1.00	LS		$	
0930	02775		ARROW PANEL	2.00	EACH		$	
0940	03171		CONCRETE BARRIER WALL TYPE 9T	1,944.00	LF		$	
0950	05950		EROSION CONTROL BLANKET	6,158.00	SQYD		$	
0960	05952		TEMP MULCH	233,578.00	SQYD		$	
0970	05953		TEMP SEEDING AND PROTECTION	175,184.00	SQYD		$	
0980	05963		INITIAL FERTILIZER	6.90	TON		$	
0990	05964		20-10-10 FERTILIZER	11.50	TON		$	
1000	05985		SEEDING AND PROTECTION	198,270.00	SQYD		$	
1010	05990		SODDING	17,930.00	SQYD		$	
1020	05992		AGRICULTURAL LIMESTONE	138.00	TON		$	
1030	06510		PAVE STRIPING-TEMP PAINT-4 IN	101,460.00	LF		$	
1040	06514		PAVE STRIPING-PERM PAINT-4 IN	82,777.00	LF		$	
1050	06516		PAVE STRIPING-PERM PAINT-8 IN	3,268.00	LF		$	
1060	06565		PAVE MARKING-THERMO X-WALK-6 IN	1,722.00	LF		$	
1070	06568		PAVE MARKING-THERMO STOP BAR-24IN	544.00	LF		$	
1080	06570		PAVE MARKING-PAINT CROSS-HATCH	2,972.00	SQFT		$	
1090	06572		PAVE MARKING-DOTTED LANE EXTEN	440.00	LF		$	
1100	06573		PAVE MARKING-THERMO STR ARROW	1.00	EACH		$	
1110	06574		PAVE MARKING-THERMO CURV ARROW	45.00	EACH		$	
1120	06575		PAVE MARKING-THERMO COMB ARROW	7.00	EACH		$	
1130	06589		PAVEMENT MARKER TYPE V-MW	431.00	EACH		$	
1140	06591		PAVEMENT MARKER TYPE V-BY	783.00	EACH		$	
1150	08901		CRASH CUSHION TY VI CLASS BT TL2	6.00	EACH		$	
1160	15092		S MANHOLE	1.00	EACH		$	
1170	15094		S MANHOLE ADJUST TO GRADE	7.00	EACH		$	
1180	23158ES505		DETECTABLE WARNINGS	939.00	SQFT		$	
1190	23274EN11F		TURF REINFORCEMENT MAT 1	5,246.00	SQYD		$	
1200	23275EN11F		TURF REINFORCEMENT MAT 2	795.00	SQYD		$	
1210	23276EN11F		TURF REINFORCEMENT MAT 3	351.00	SQYD		$	
1220	23626EC		DETENTION BASIN (STA 101+56.57)	1.00	LS		$	
1230	23626EC		DETENTION BASIN (STA 194+55.35)	1.00	LS		$	
1240	23649EC		DRAIN POND STA. 195+20	1.00	LS		$	
1250	23649EC		DRAIN POND STA. 217+14	1.00	LS		$	

Report Date 9/18/18

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1260	23649EC		DRAIN POND STA. 222+83	1.00	LS		$	
1270	23791EC		PAVE STRIPING-CHEVRON MARKINGS	1,298.00	SQFT		$	
1280	24845EC		UTILITY COORDINATION	1.00	LS		$	

Section: 0004 - DRAINAGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1290	00440		ENTRANCE PIPE-15 IN	199.00	LF		$	
1300	00466		CULVERT PIPE-30 IN	8.00	LF		$	
1310	00470		CULVERT PIPE-48 IN	236.00	LF		$	
1320	00472		CULVERT PIPE-60 IN	201.00	LF		$	
1330	00521		STORM SEWER PIPE-15 IN	8,149.00	LF		$	
1340	00522		STORM SEWER PIPE-18 IN	4,495.00	LF		$	
1350	00524		STORM SEWER PIPE-24 IN	1,424.00	LF		$	
1360	00528		STORM SEWER PIPE-36 IN	239.00	LF		$	
1370	01202		PIPE CULVERT HEADWALL-15 IN	4.00	EACH		$	
1380	01204		PIPE CULVERT HEADWALL-18 IN	9.00	EACH		$	
1390	01208		PIPE CULVERT HEADWALL-24 IN	5.00	EACH		$	
1400	01210		PIPE CULVERT HEADWALL-30 IN	1.00	EACH		$	
1410	01212		PIPE CULVERT HEADWALL-36 IN	1.00	EACH		$	
1420	01216		PIPE CULVERT HEADWALL-48 IN	2.00	EACH		$	
1430	01220		PIPE CULVERT HEADWALL-60 IN	1.00	EACH		$	
1440	01456		CURB BOX INLET TYPE A	79.00	EACH		$	
1450	01480		CURB BOX INLET TYPE B	1.00	EACH		$	
1460	01544		DROP BOX INLET TYPE 11	5.00	EACH		$	
1470	01559		DROP BOX INLET TYPE 13G	7.00	EACH		$	
1480	01581		DROP BOX INLET TYPE 16G	1.00	EACH		$	
1500	02600		FABRIC GEOTEXTILE TY IV FOR PIPE	52,525.00	SQYD	$2.00	$	$105,050.00
1510	22766ED		TRENCH DRAIN	16.00	LF		$	
1520	23609ED		HYDRAULIC CONTROL STRUCTURE (STA 101+56.57)	1.00	LS		$	
1530	23609ED		HYDRAULIC CONTROL STRUCTURE (STA 194+55.35)	1.00	LS		$	
1540	23952EC		DRAINAGE JUNCTION BOX TY B	5.00	EACH		$	
1550	24814EC		PIPELINE INSPECTION	7,376.00	LF		$	

Section: 0005 - BRIDGE-27648

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1560	02231		STRUCTURE GRANULAR BACKFILL	1,056.20	CUYD		$	
1570	02998		MASONRY COATING	1,054.00	SQYD		$	
1580	08001		STRUCTURE EXCAVATION-COMMON	4,926.00	CUYD		$	
1590	08002		STRUCTURE EXCAV-SOLID ROCK	145.00	CUYD		$	
1600	08019		CYCLOPEAN STONE RIP RAP	3,698.00	TON		$	
1610	08033		TEST PILES	78.00	LF		$	
1620	08046		PILES-STEEL HP12X53	972.00	LF		$	
1630	08094		PILE POINTS-12 IN	32.00	EACH		$	

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1640	08100		CONCRETE-CLASS A	603.30	CUYD		$	
1650	08104		CONCRETE-CLASS AA	1,009.30	CUYD		$	
1660	08135		MECHANICAL REINF COUPLER #10	43.00	EACH		$	
1670	08150		STEEL REINFORCEMENT	67,877.00	LB		$	
1680	08151		STEEL REINFORCEMENT-EPOXY COATED	249,355.00	LB		$	
1690	08634		PRECAST PC I BEAM TYPE 4	1,612.30	LF		$	
1700	23630EC		ARMORED EDGE FOR CONCRETE	1.00	LS		$	
1710	23813EC		DECK DRAIN	24.00	EACH		$	

Section: 0006 - BRIDGE-CULVERT 27646

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1720	08002		STRUCTURE EXCAV-SOLID ROCK	13.00	CUYD		$	
1730	08003		FOUNDATION PREPARATION	1.00	LS		$	
1740	08100		CONCRETE-CLASS A	511.20	CUYD		$	
1750	08150		STEEL REINFORCEMENT	69,192.00	LB		$	

Section: 0007 - BRIDGE-RETAINING WALL 27647

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1760	08001		STRUCTURE EXCAVATION-COMMON	37.00	CUYD		$	
1770	08002		STRUCTURE EXCAV-SOLID ROCK	51.00	CUYD		$	
1780	08039		PRE-DRILLING FOR PILES	60.00	LF		$	
1790	08051		PILES-STEEL HP14X89	165.00	LF		$	
1800	08100		CONCRETE-CLASS A	17.10	CUYD		$	
1810	08150		STEEL REINFORCEMENT	2,354.00	LB		$	
1820	21119ED		CONCRETE FORM LINER	42.00	SQYD		$	

Section: 0008 - SIGNING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1830	06406		SBM ALUM SHEET SIGNS .080 IN	350.00	SQFT		$	
1840	06407		SBM ALUM SHEET SIGNS .125 IN	80.00	SQFT		$	
1850	06410		STEEL POST TYPE 1	300.00	LF		$	
1860	06411		STEEL POST TYPE 2	900.00	LF		$	
1870	06490		CLASS A CONCRETE FOR SIGNS	.65	CUYD		$	
1880	21373ND		REMOVE SIGN	5.00	EACH		$	
1890	21596ND		GMSS TYPE D	10.00	EACH		$	
1900	24631EC		BARCODE SIGN INVENTORY	81.00	EACH		$	

Section: 0009 - SIGNALIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1910	04795		CONDUIT-2 IN	1,100.00	LF		$	
1920	04811		ELECTRICAL JUNCTION BOX TYPE B	6.00	EACH		$	

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1930	04820		TRENCHING AND BACKFILLING	1,100.00	LF		$	
1940	04830		LOOP WIRE	4,000.00	LF		$	
1950	04844		CABLE-NO. 14/5C	2,200.00	LF		$	
1960	04850		CABLE-NO. 14/1 PAIR	4,000.00	LF		$	
1970	04885		MESSENGER-10800 LB	450.00	LF		$	
1980	04895		LOOP SAW SLOT AND FILL	1,100.00	LF		$	
1990	04931		INSTALL CONTROLLER TYPE 170	1.00	EACH		$	
2000	04932		INSTALL STEEL STRAIN POLE	4.00	EACH		$	
2010	20093NS835		INSTALL PEDESTRIAN HEAD-LED	8.00	EACH		$	
2020	20188NS835		INSTALL LED SIGNAL-3 SECTION	8.00	EACH		$	
2030	20456NS835		INSTALL TEMP VIDEO CAMERA	5.00	EACH		$	
2040	21743NN		INSTALL PEDESTRIAN DETECTOR	8.00	EACH		$	
2050	23157EN		TRAFFIC SIGNAL POLE BASE	18.00	CUYD		$	
2060	24955ED		REMOVE SIGNAL EQUIPMENT	1.00	EACH		$	

Section: 0010 - LIGHTING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2070	04701		POLE 40 FT MTG HT	18.00	EACH		$	
2080	04722		BRACKET 8 FT	3.00	EACH		$	
2090	04725		BRACKET 15 FT	15.00	EACH		$	
2100	04740		POLE BASE	18.00	EACH		$	
2110	04750		TRANSFORMER BASE	18.00	EACH		$	
2120	04761		LIGHTING CONTROL EQUIPMENT	1.00	EACH		$	
2130	04780		FUSED CONNECTOR KIT	18.00	EACH		$	
2140	04793		CONDUIT-1 1/4 IN	3,600.00	LF		$	
2150	04795		CONDUIT-2 IN	375.00	LF		$	
2160	04820		TRENCHING AND BACKFILLING	4,000.00	LF		$	
2170	04832		WIRE-NO. 12	1,836.00	LF		$	
2180	04833		WIRE-NO. 8	10,800.00	LF		$	
2190	20391NS835		ELECTRICAL JUNCTION BOX TYPE A	4.00	EACH		$	
2200	24589ED		LED LUMINAIRE	18.00	EACH		$	

Section: 0011 - WATERLINE-BOONE COUNTY WATER DISTRICT

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2210	14004		W DIRECTIONAL BORE	200.00	LF		$	
2220	14009		W ENCASEMENT STEEL BORED RANGE 4	77.00	LF		$	
2230	14011		W ENCASEMENT STEEL BORED RANGE 6	64.00	LF		$	
2240	14018		W FIRE HYDRANT ADJUST	3.00	EACH		$	
2250	14019		W FIRE HYDRANT ASSEMBLY	11.00	EACH		$	
2260	14020		W FIRE HYDRANT RELOCATE	15.00	EACH		$	
2270	14029		W METER ADJUST	3.00	EACH		$	
2280	14030		W METER RELOCATE	28.00	EACH		$	
2290	14037		W PIPE DUCTILE IRON 08 INCH	1,044.00	LF		$	
2300	14039		W PIPE DUCTILE IRON 12 INCH	130.00	LF		$	
2310	14040		W PIPE DUCTILE IRON 16 INCH	9,088.00	LF		$	

PROPOSAL BID ITEMS

Report Date 9/18/18

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2320	14048		W PIPE DCTL IRON RSTRND JOINT 08 IN	93.00	LF		$	
2330	14050		W PIPE DCTL IRON RSTRND JOINT 12 IN	100.00	LF		$	
2340	14051		W PIPE DCTL IRON RSTRND JOINT 16 IN	281.00	LF		$	
2350	14074		W PLUG EXISTING MAIN	2.00	EACH		$	
2360	14090		W TAPPING SLEEVE AND VALVE SIZE 2	1.00	EACH		$	
2370	14095		W TIE-IN 08 INCH	5.00	EACH		$	
2380	14097		W TIE-IN 12 INCH	2.00	EACH		$	
2390	14098		W TIE-IN 16 INCH	3.00	EACH		$	
2400	14106		W VALVE 08 INCH	6.00	EACH		$	
2410	14108		W VALVE 12 INCH	3.00	EACH		$	
2420	14109		W VALVE 16 INCH	14.00	EACH		$	
2430	14113		W VALVE BOX ADJUST	11.00	EACH		$	
2440	14118		W VALVE CUT-IN 08 INCH	4.00	EACH		$	
2450	14121		W VALVE CUT-IN 16 INCH	2.00	EACH		$	
2460	14145		W SERV COPPER LONG SIDE 1 IN	1.00	EACH		$	
2470	14147		W SERV COPPER LONG SIDE 2 IN	1.00	EACH		$	
2480	14148		W SERV COPPER LONG SIDE 3/4 IN	15.00	EACH		$	
2490	14152		W SERV COPPER SHORT SIDE 3/4 IN	20.00	EACH		$	

Section: 0012 - WATERLINE-CITY OF FLORENCE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2500	14001		W AIR RELEASE VALVE 3/4 INCH	1.00	EACH		$	
2510	14019		W FIRE HYDRANT ASSEMBLY	1.00	EACH		$	
2520	14037		W PIPE DUCTILE IRON 08 INCH	250.00	LF		$	
2530	14095		W TIE-IN 08 INCH	2.00	EACH		$	
2540	14113		W VALVE BOX ADJUST	7.00	EACH		$	

Section: 0013 - DEMOBILIZATION &/OR MOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2550	02568		MOBILIZATION	1.00	LS		$	
2560	02569		DEMOBILIZATION	1.00	LS		$	