



CALL NO. 111

CONTRACT ID. 225232

PERRY COUNTY

FED/STATE PROJECT NUMBER STP BRZ 9030 (317)

DESCRIPTION CR 1114 - KENMONT ROAD

WORK TYPE BRIDGE REPLACEMENT

PRIMARY COMPLETION DATE 8/23/2022

LETTING DATE: February 24,2022

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 am EASTERN STANDARD TIME February 24,2022. Bids will be publicly announced at 10:00 am EASTERN STANDARD TIME.

NO PLANS ASSOCIATED WITH THIS PROJECT.

DBE CERTIFICATION REQUIRED - 4.50%

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

TABLE OF CONTENTS

PART I	SCOPE OF WORK <ul style="list-style-type: none">• PROJECT(S), COMPLETION DATE(S), & LIQUIDATED DAMAGES• CONTRACT NOTES• FEDERAL CONTRACT NOTES• ASPHALT MIXTURE• INCIDENTAL SURFACING• COMPACTION OPTION B• SPECIAL NOTE(S) APPLICABLE TO PROJECT• LIQUIDATED DAMAGES• TREE REMOVAL• RIGHT OF WAY CERTIFICATION• UTILITY IMPACT & RAIL CERTIFICATION NOTES• GENERAL UTILITY NOTES• WATER STANDARD UTILITY BID ITEMS• WATERLINE SPECIFICATIONS• DEPT OF ARMY - NATIONWIDE PERMIT• GEOTECHNICAL NOTES
PART II	SPECIFICATIONS AND STANDARD DRAWINGS <ul style="list-style-type: none">• SPECIFICATIONS REFERENCE• SUPPLEMENTAL SPECIFICATION• [SN-1I] PORTABLE CHANGEABLE SIGNS• [SP-69] EMBANKMENT AT BRIDGE END BENT STRUCTURES
PART III	EMPLOYMENT, WAGE AND RECORD REQUIREMENTS <ul style="list-style-type: none">• FEDERAL-AID CONSTRUCTION CONTRACTS - FHWA 1273• NONDISCRIMINATION OF EMPLOYEES• EXECUTIVE BRANCH CODE OF ETHICS• PROJECT WAGE RATES LOCALITY 2 / FEDERAL• NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EEO PERRY
PART IV	INSURANCE
PART V	BID ITEMS

PART I

SCOPE OF WORK

ADMINISTRATIVE DISTRICT - 10

CONTRACT ID - 225232
STP BRZ 9030 (317)
COUNTY - PERRY
PCN - BR09711142200
STP BRZ 9030 (317)

CR 1114 - KENMONT ROAD (MP 0.052) REPLACE BRIDGE ON KENMONT ROAD (CR 1114) (MP 0.091) OVER
NORTH FORK KENTUCKY RIVER. (097C00005N) (MP 0.132), A DISTANCE OF 0.08 MILES.BRIDGE REPLACEMENT
SYP NO. 10-01113.00.
GEOGRAPHIC COORDINATES LATITUDE 37:12:23.00 LONGITUDE -83:07:54.00

COMPLETION DATE(S):
COMPLETED BY 08/23/2022 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 Rating | 102.08 Preparation and Delivery of Proposals |
| 102.13 Irregular Bid Proposals | 102.14 Disqualification of Bidders |
| 102.09 Proposal Guaranty | |

CIVIL RIGHTS ACT OF 1964

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

NOTICE TO ALL BIDDERS

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

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

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

SECOND TIER SUBCONTRACTS

Second tier subcontracts are acceptable per Section 108.01 of the Standard Specifications for Road and Bridge Construction. There are special rules to DBE subcontractors satisfying DBE goals on federal-aid projects. 1st-Tier DBE Subcontractors may only enter into a 2nd-Tier subcontract with another DBE contractor.

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 Proposal Line Number, 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, along with the DBE's certificate of insurance. If the DBE is a supplier of materials for the project, a signed purchase order 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 (hard copy along with an electronic copy) of this information must be received in the Division of Contract Procurement no later than 12:00 noon of the tenth calendar day after receipt of notification that they are the apparent low bidder.

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

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

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

FAILURE TO MEET GOOD FAITH REQUIREMENT

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

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

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

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

SANCTIONS FOR FAILURE TO MEET DBE REQUIREMENTS OF THE PROJECT

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

- Suspension of Prequalification;
- 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 and Non-DBE Subcontractors 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 of Subcontractor Payment (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 completed and signed within 7 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.

******* IMPORTANT *******

Please mail the original, signed and completed TC (18-7) Affidavit of Subcontractor Payment form and all copies of checks for payments listed above to the following address:

Office of Civil Rights and Small Business Development
6th Floor West 200 Mero Street
Frankfort, KY 40622

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 in this office is Mr. Melvin Bynes. Mr. Bynes' current contact information is email address – melvin.bynes2@ky.gov and the telephone number is (502) 564-3601.

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.

PROHIBITION ON TELECOMMUNICATIONS EQUIPMENT OR SERVICES

In accordance with the FY 2019 National Defense Authorization Act (NDAA), 2 CFR 200.216, and 2 CFR 200.471, Federal agencies are prohibited, after August 13, 2020, from obligating or expending financial assistance to obtain certain telecommunications and video surveillance services and equipment from specific producers. As a result of these regulations, contractors and subcontractors are prohibited, on projects with federal funding participation, from providing telecommunication or video surveillance equipment, services, or systems produced by:

- Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities)
- Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities)

**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.

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.

OPTION B

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

COUNTY OF	ITEM NO.	SHEET
PERRY	10-1113	317

TYPICAL SECTIONS KENMONT ROAD

CONVENTIONAL SIGNS

SURVEY LINE

GRADE LINE

COUNTY LINE

CORPORATE LIMITS

EXIST. PROPERTY LINE

PROPOSED RIGHT OF WAY

RIGHT OF WAY MONUMENT

BENCH MARK

EXISTING R/W MARKER

RIGHT OF WAY MONUMENT

EASTING/PROPOSED

UTILITY TEST HOLE

EXISTING ROAD

FENCE CONTROLLED ACCESS

FENCE EXCEPT STONE AND HEDGE

TREE LINE

TREES

PIPE CULVERT

CULVERT

BRIDGE

BUILDINGS

GUARDRAIL

EXISTING

PROPOSED

LIGHTING POLE

POWER POLE

JOINT POWER & TELEPHONE POLE

TELEPHONE & TELEGRAPH POLE

ANCHOR, POWER OR TELEPHONE

STUB POWER

STUB TELEPHONE

WATER MAIN

GAS MAIN

TELEPHONE DUCT

ELECTRIC DUCT

TV CABLE

SANITARY SEWER WITH MANHOLE

STORM SEWER WITH MANHOLE

DIRECT BURIAL TELEPHONE CABLE

OVERHEAD WIRE

TRAFFIC LIGHTS

ELECTRIC MANHOLE

TELEPHONE MANHOLE

STONE FENCE

HEDGE FENCE

SWAMP OR MARSH

SPRINGS

SINKHOLE

QUARRY SITE

BLUE LINE STREAM

INTERMITTENT STREAM

LAKES OR PONDS

REGULATED FLOODWAY

NORTH POINT

FILE NAME: ...097C0005NA\Roadway\18a8f97n002

USBR Jordan, T. 10/10/2012 12/21/2021 12/24/23 PM

E-SHEET NAME: MicroStation v8.11.9.196

FULL-DEPTH MAINLINE & SHOULDER PAVEMENT RECONSTRUCTION

TRAFFIC LANES:
DENSE GRADED AGGREGATE
CL2 ASPH BASE 1.000 PG64-22
CL2 ASPH BASE 1.000 PG64-22
CL2 ASPH SURF 0.380 PG64-22
1.25" DEPTH
SHOULDERS:
DENSE GRADED AGGREGATE
CL2 ASPH BASE 1.000 PG64-22
CL2 ASPH BASE 1.000 PG64-22
CL2 ASPH SURF 0.380 PG64-22
1.25" DEPTH

NOTES:
DGA BASE OR OTHER GRANULAR MATERIAL APPROVED BY THE ENGINEER NEEDED FOR SHOULDERS OUTSIDE OF PAVED AREA WILL BE MEASURED AND PAID AS GRANULAR EMBANKMENT IN ACCORDANCE WITH THE SPECIAL NOTE FOR BRIDGE. OFFER APPROACH PAVEMENT - GEOTEXTILE FABRIC CLASS 2 (SEPARATION) SHALL BE INCIDENTAL TO GRANULAR EMBANKMENT.

① ASPHALT SEAL REQUIRED FROM OUTSIDE EDGE OF PAVED SHOULDER TO A POINT 2' DOWN THE DITCH OR FILL SLOPE.
TWO APPLICATIONS OF THE FOLLOWING:
ASPHALT SEAL COAT 2.40 LBS/SY
ASPHALT SEAL AGGREGATE 2.00 LBS/SY SIZE NO. 8 OR 9M
② SHOULDERS SHALL BE WIDENED 3 FEET 5 INCHES WHERE GUARDRAIL IS TO BE INSTALLED ALLOWING FOR 2 FEET OF FILL BEHIND THE POSTS. IF IT IS NOT PRACTICAL TO WIDEN THE SHOULDER BY 2 FEET, THEN LONGER POSTS MAY BE USED.

ROADWAY NORMAL SECTION
STA. 20+65 TO STA. 21+25
STA. 23+92 TO STA. 24+25

BRIDGE NORMAL SECTION
STA. 21+25 TO STA. 23+92



NOT TO SCALE

PREPARED BY
AECOM

BRIDGING KENTUCKY

KENMONT ROAD OVER
NORTH FORK KENTUCKY RIVER
TYPICAL SECTIONS

PROJECT COORDINATES. Coordinates for horizontal control were obtained by GPS observations using Topcon HyperV and Sokkia coordinates for horizontal control on the NAD83 Kentucky State Plane Coordinate System, KY Single Zone, US Survey GRS81 GNSS receivers on the NAD83 Kentucky State Plane Coordinate System, KY Single Zone, US Survey GRS81 GNSS receivers on the KYORS RTN GPS Network on December 13, 2018. A conventional resection was performed resulting in an unadjusted error of closure of 1:14,262. No adjustment was performed. The coordinates were calculated using the unadjusted error of closure of 1:14,262. No project datum factor was calculated or used for this project.

BASIS OF ELEVATIONS

Elevations were established by GPS observations on the NAVD88 vertical datum, GEOID12B utilizing the KYCORS RTN Network and were adjusted by closed differential level loop based on the elevation of CP 1 = 897.21'.

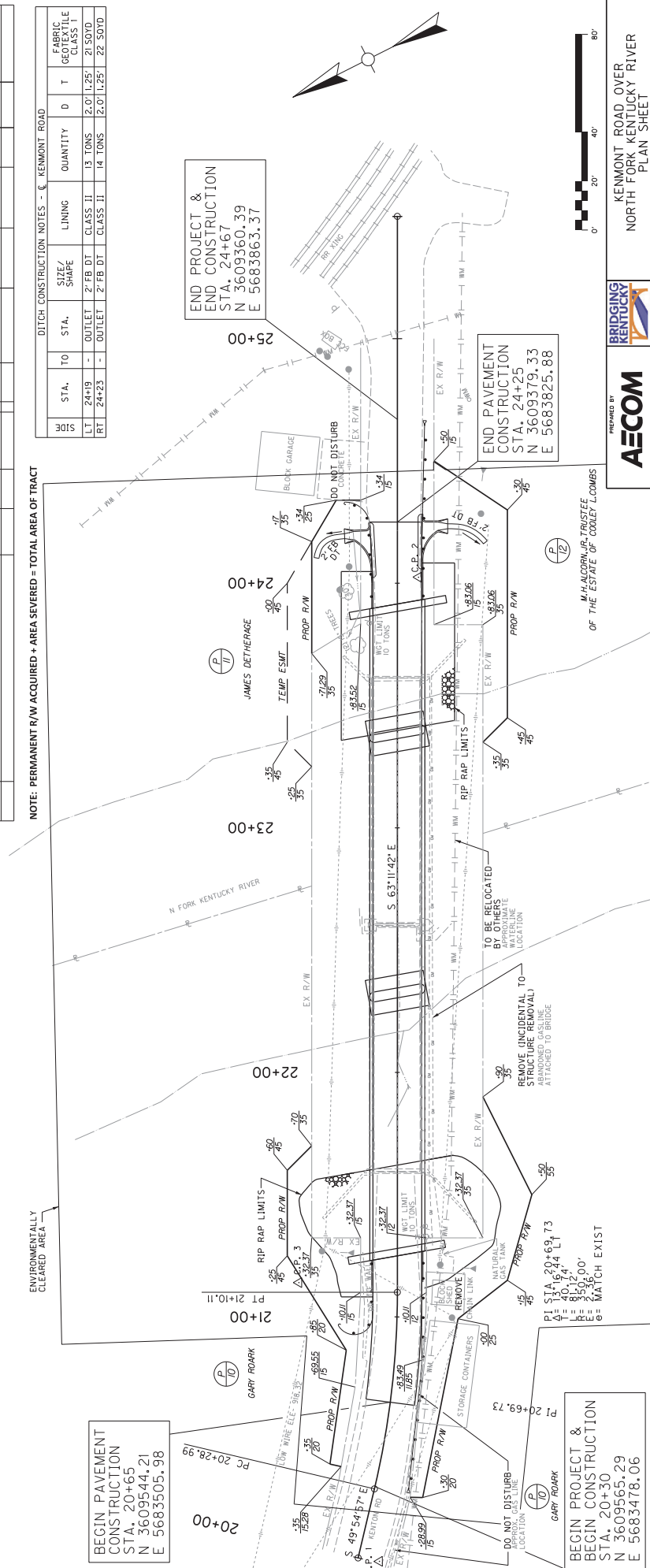
POINT	DESCRIPTION	State Plane Coordinates			STATION	OFFSET
		NORTH (Y)	EAST (X)	ELEV. (Z)		
CP 1	5/8" REBAR & CAP	3609577.30	5683449.9	897.21	20+00.72	8.94' RT
CP 2	5/8" REBAR & CAP	3609381.60	5683801.86	895.46	24+02.53	8.80' RT
CP 3	5/8" REBAR & CAP	3609555.33	5683566.48	897.79	21+14.11	40.11' LT

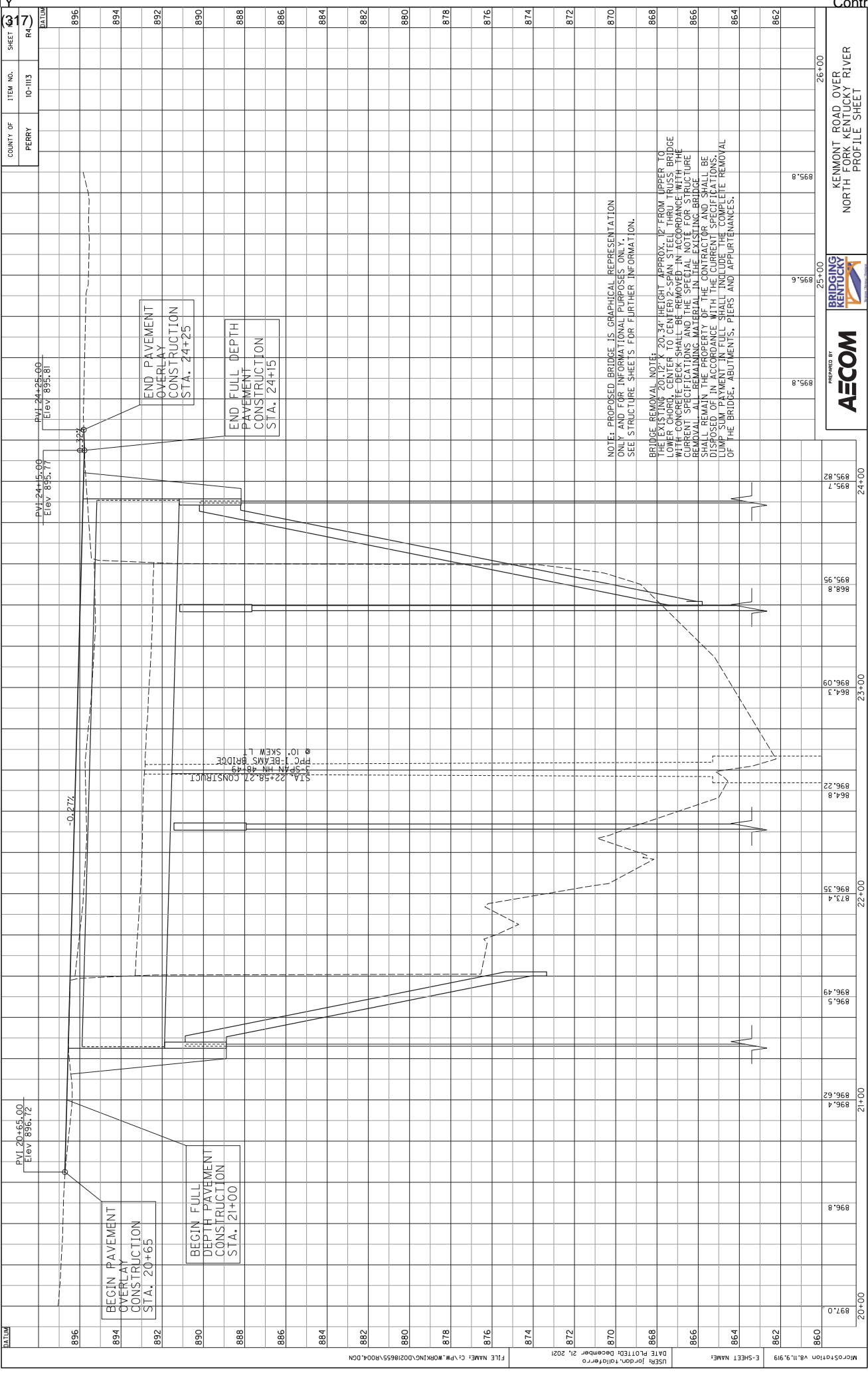
POINT	DESCRIPTION	State Plane Coordinates			STATION	OFFSET
		NORTH (Y)	EAST (X)	ELEV. (Z)		
CP 1	5/8" REBAR & CAP	3609577.30	5683449.9	897.21	20+00.72	8.94' RT
CP 2	5/8" REBAR & CAP	3609391.60	5683801.86	895.46	24+02.53	8.80' RT
CP 3	5/8" REBAR & CAP	3609555.33	5683566.48	897.79	21+14.11	40.1' LT

PARCEL NO.	OWNER(S)	AREA OBTAINED BY	TOTAL AREA OF TRACT		PERMANENT R/W ACQUIRED		EASEMENTS		SOURCE OF TITLE
			ACRES	SQ. FT.	ACRES	SQ. FT.	PERMANENT	TEMPORARY	
10	GARY ROARK	DEED	3		0.09	3804			DB315 PG 13
11	JAMES DETHRAGE	PVA	0.5		0.02	1047		785	DB383 PG 744
12	MR. H. ALCOURN JR. TRUSTEE OF THE ESTATE OF COOLET L. COMBS	DEED	2		0.05	2139		1.95	DB196 PG 132

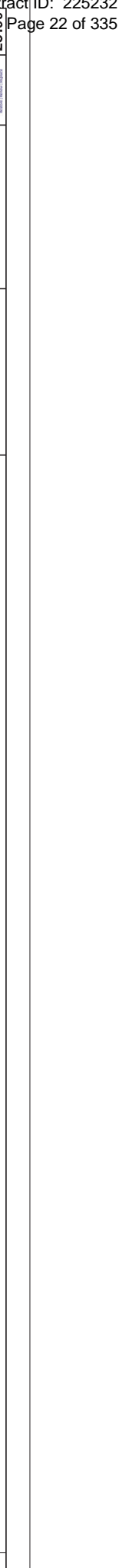
DITCH CONSTRUCTION NOTES - C KENMONT ROAD						
SIDE	STA.	TO STA.	SIZE/ SHAPE	LINING	QUANTITY	FABRIC GEOTEXTILE CLASS I
LT	24+19	-	OUTLET	2' FB DT	13 TONS	2.0' 1.25'
RT	24+23	-	OUTLET	2' FB DT	14 TONS	2.0' 1.25'
						21 SOYO
						22 SOYO

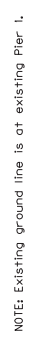
NOTE: PERMANENT R/W ACQUIRED + AREA SEVERED = TOTAL AREA OF TRACT





Page 21 of 335





PIER 1

INTEGRAL END BENT 2

1. A diesel pile driving hammer with a rated energy between 115 foot-kips and 200 foot-kips will be required to drive I25S steel piles to pre-determined depth without encountering excessive blow counts or compounding the pile. The contractor shall be responsible for the design of the pile system. The Engineer will be responsible for the installation of the final pile system. Approval of the pile driving system by the Engineer will be subject to satisfactory field performance of the pile driving procedures.
2. The installation of the pile foundations should conform to current AASHTO LRFD Bridge Design Specifications, and Section 604 of the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.
3. The Kentucky Transportation Cabinet recommends that protective pile tops be used on end bearing piles to allow for embedment into the top of bedrock, use of reinforced pile points capable of penetrating boulders and hard layers which may be encountered is recommended. Installation of pile points should be in accordance with Section 604 of the Kentucky Standard Specifications for Road and Bridge Construction, current edition.

Definitions of Terms

Driving Criteria

PRACTICAL RECOMMENDATIONS: For this project minimum blow requirements are reached after total penetration becomes $1/2$ or less for 10 consecutive blows, practical refusal is reached when the blow count is 10 or less. Avoidance of the production piling to the driving resistance specified above and to depths determined by test piling and subar foot test sheetpile, immediately cease driving operations if the pile vislay yields or becomes damaged during driving. If hard driving becomes necessary, the driving rate should be reduced to 10 blows per minute. Before the pile is advanced to the depth indicated, the Engineer will determine if more blows than the average blow driving resistance specified for practical refusal is required to further advance the pile. Drive additional production and test piles if required by the Engineer.

For each pile, the Project Engineer shall record the following on this sheet: Pile Length in Place and Point of Pile Elevation as Driven.

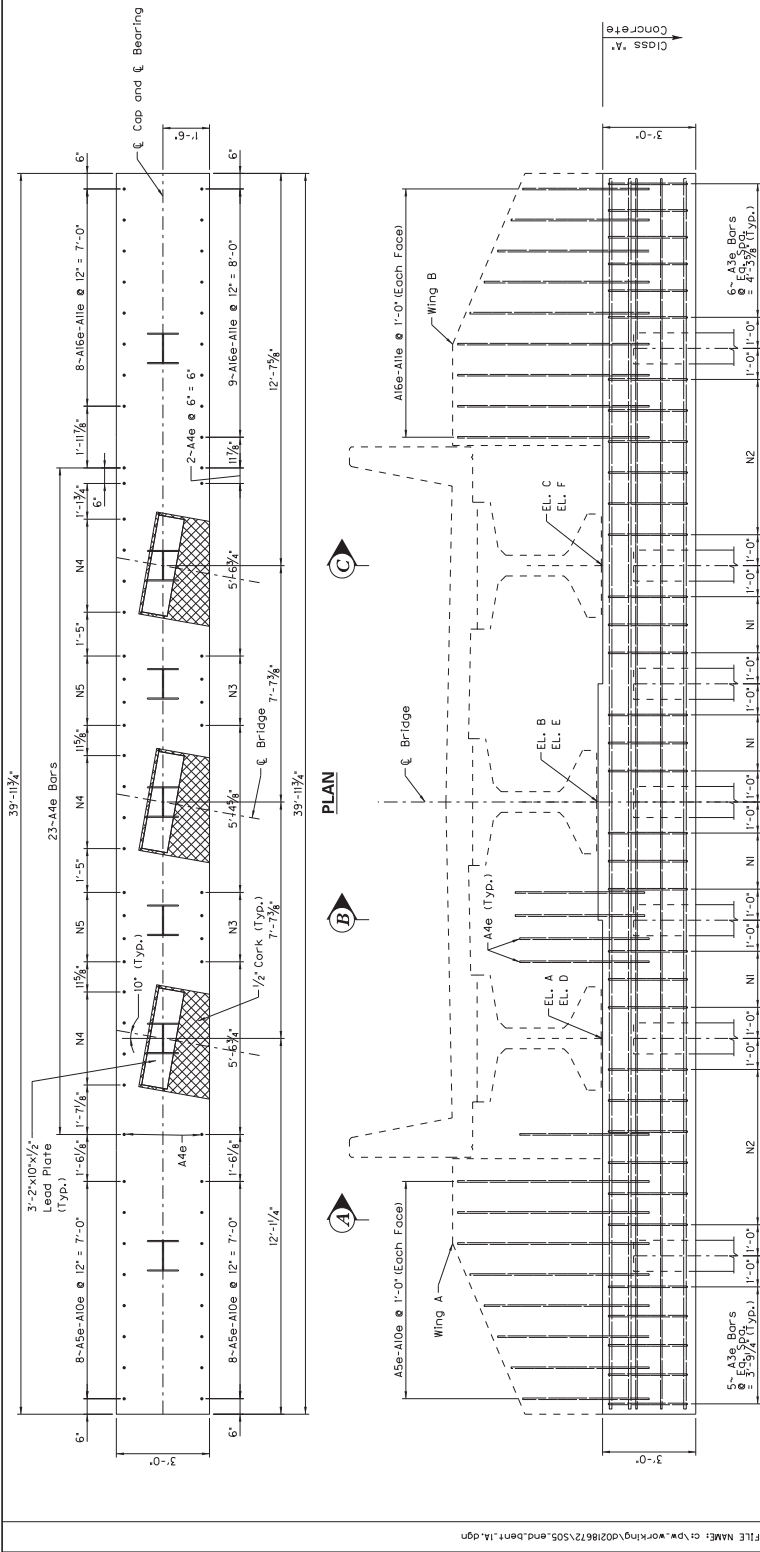
Submit this record to:
Kentucky Transportation Cabinet
Director, Division of Structural Design
3rd Floor East
200 Merz Street
Frankfort, KY 40622

This pile record does not replace other pile records the Project Engineer is required to keep and submit.
Use HP 12x53 in accordance with BPS-003, c.e.

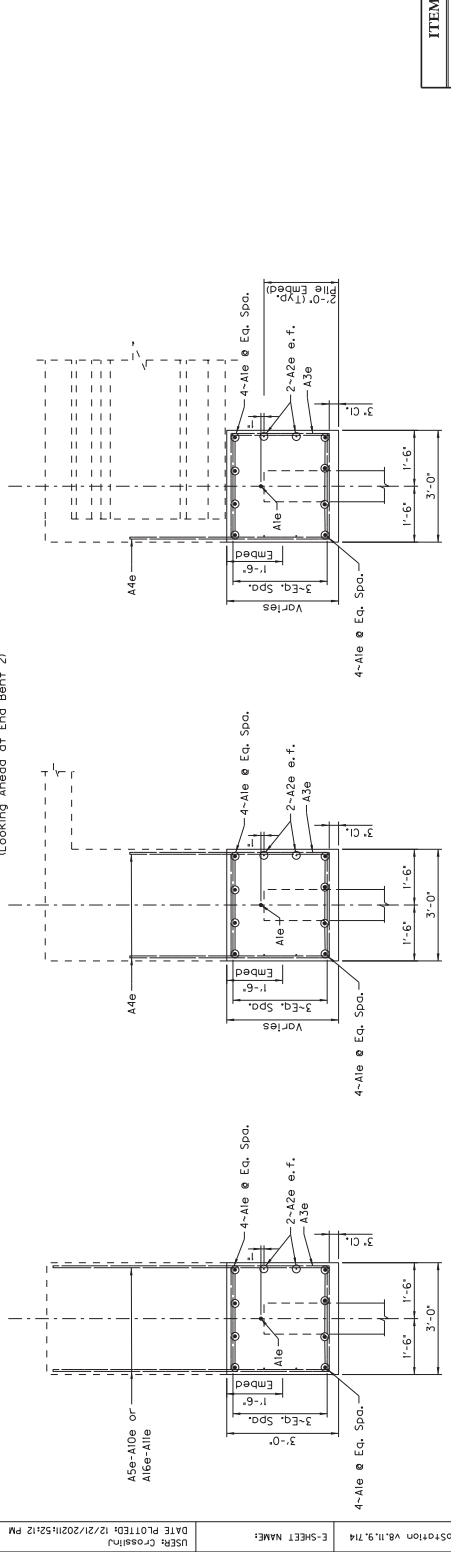
ITEM NUMBER	10-1113	PREPARED BY AECOM		SHEET NO. S04	DRAWING NO. 28190
				BRIDGING KENTUCKY <small>BRIDGE DESIGN GROUP</small>	

NI Denotes: 3-A3e Bars @ Eq. Spa. = 1'-9 3/4"
N2 Denotes: 6-A3e Bars @ 1'-0" = 5'-0"
N3 Denotes: 4-A4e Bars @ Eq. Spa. = 2'-2 3/4"
N4 Denotes: 4-A4e, 3 Spa. @ 1'-0" = 3'-0"
N5 Denotes: 4-A4e, 3 Eq. Spa. = 2'-2 3/4"

Note:
If laps are necessary use the following:
• #5 Bar - 3'-4" min lap
• #6 Bar - 4'-0" min lap
• #8 Bar - 5'-4" min lap



ELEVATION
(Looking Back at End Bent 1)
(Looking Ahead at End Bent 2)



ELEVATION TABLE

Location	Elevation (ft)
EL. A (Girder 3, End Bent 1)	891.479
EL. B (Girder 2, End Bent 1)	891.632
EL. C (Girder 1, End Bent 1)	891.486
EL. D (Girder 1, End Bent 2)	890.774
EL. E (Girder 2, End Bent 2)	890.921
EL. F (Girder 3, End Bent 2)	890.767

DATE: 12/21/2021
DESIGNED BY: J. CROSSLIN
CHECKED BY: A. EDELEN
DETAILED BY: J. CROSSLIN
A. EDELEN

Commonwealth of Kentucky
Department of Highways

ROUTE
N. FORK KENTUCKY RIVER
END BENT 1 AND 2 (1 of 2)

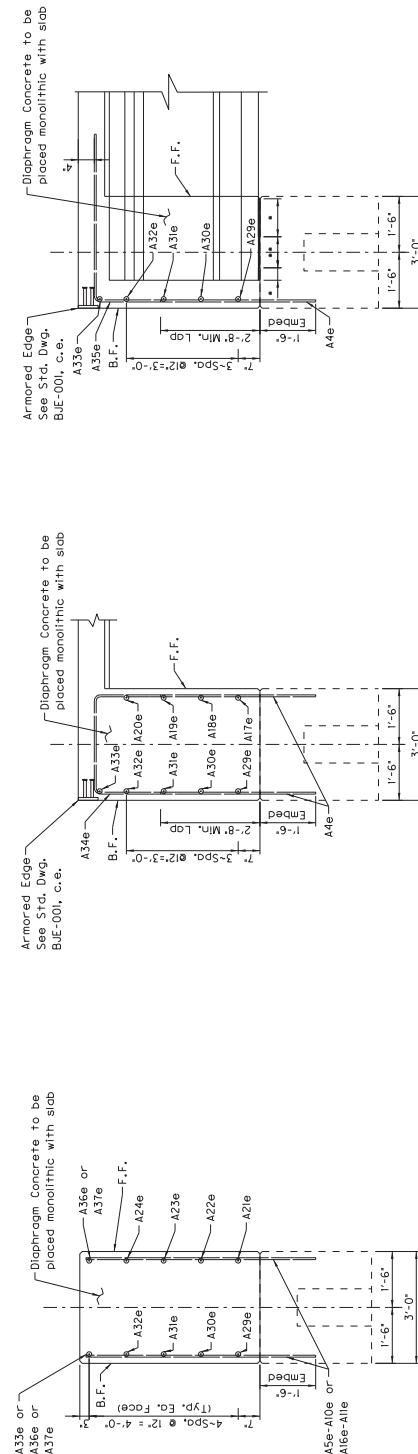
PREPARED BY
PERRY

ROUTE
N. FORK KENTUCKY RIVER
END BENT 1 AND 2 (1 of 2)

PROJECT NO.
28190

SHEET NO.
28190

ITEM NUMBER
10-1113

[illegible]

PREPARED BY

AECOM

10-1113

SECTION F-F

SECTION E-E

SECTION D-D

PREPARED BY
AECOM

10-1113

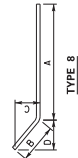
SECTION F-F

SECTION E-E

SECTION D-D

BILL OF REINFORCEMENT PER END BENT

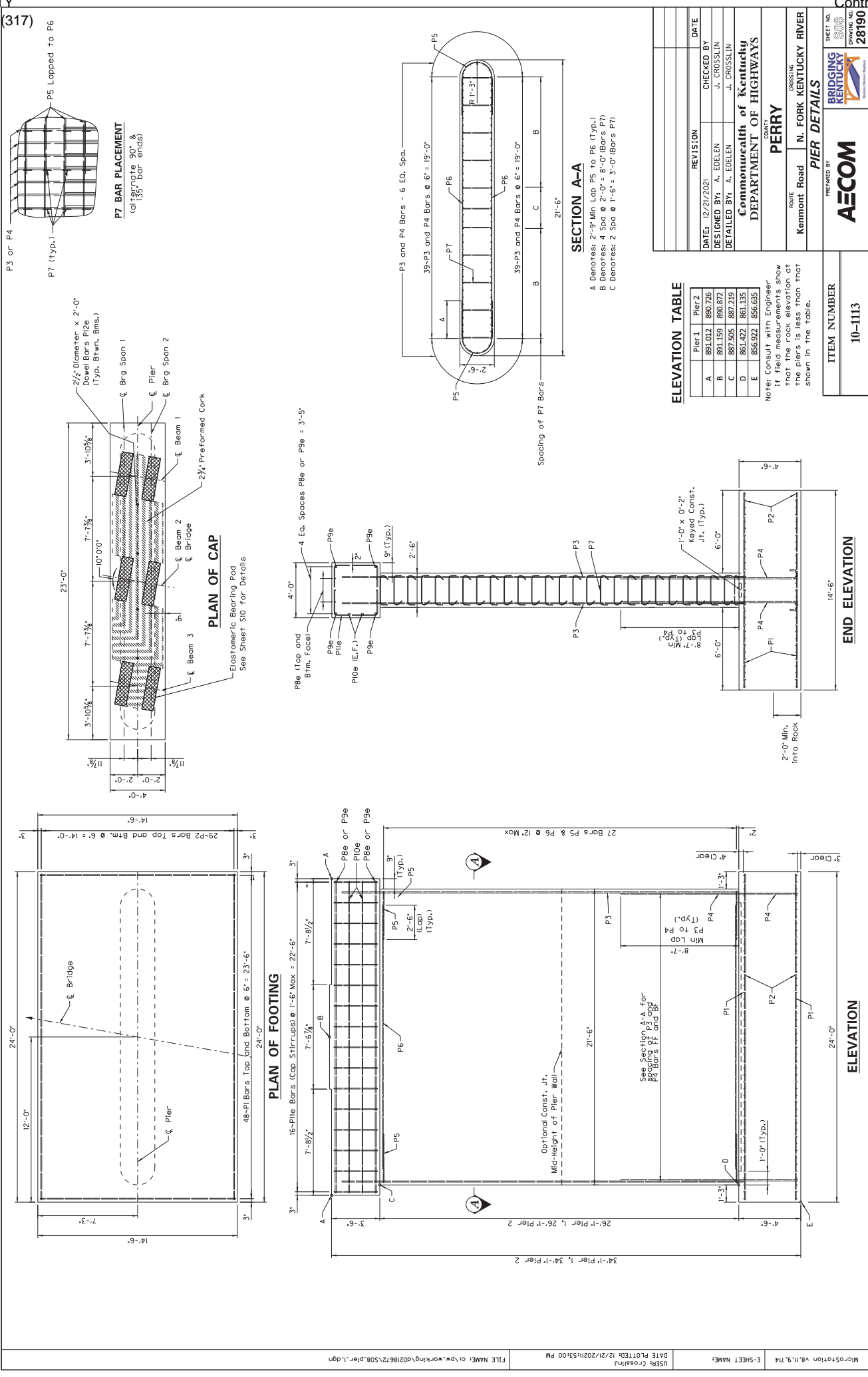
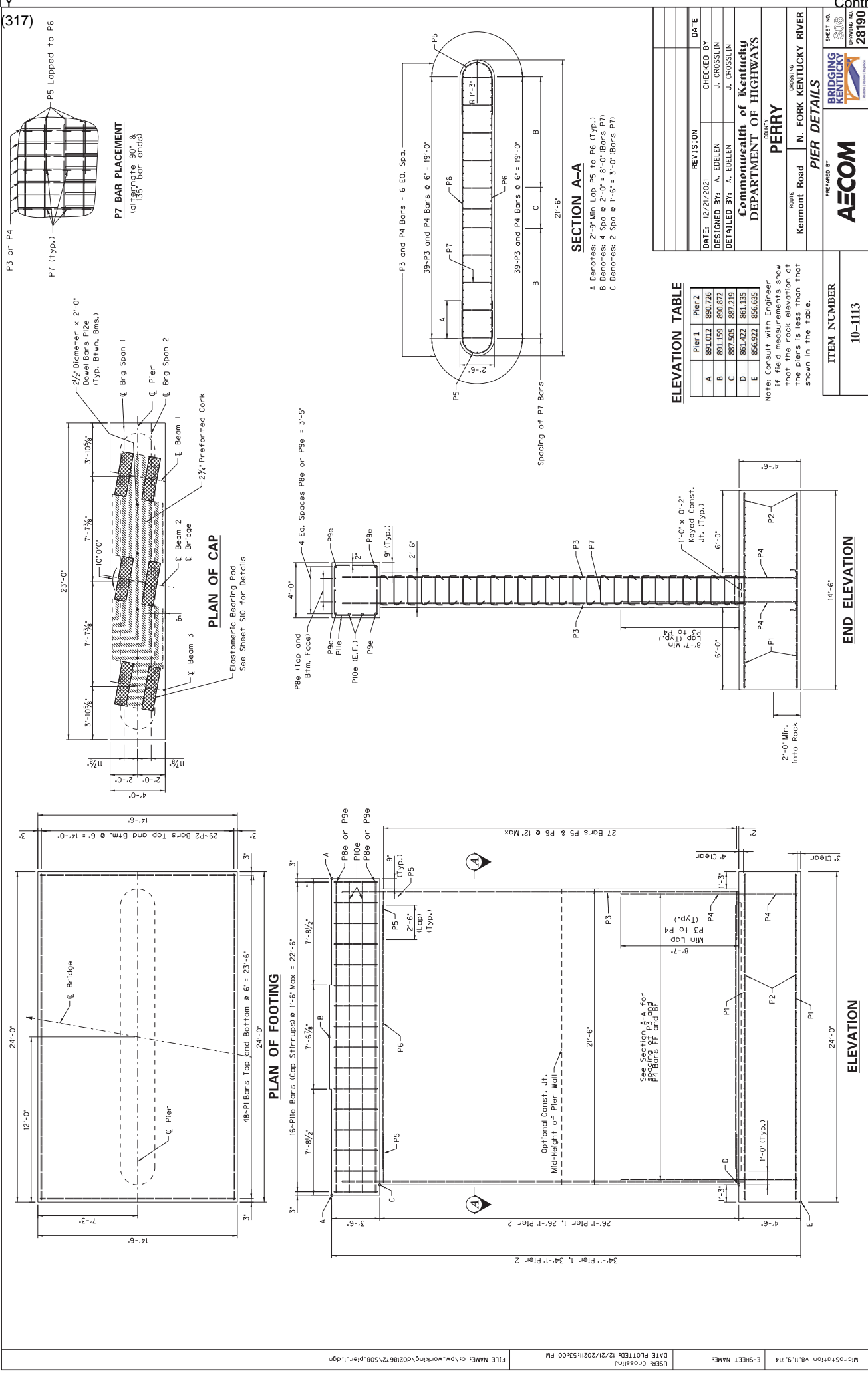
Mark	Type	NUMBER RCOD.	SIZE	Length		LOCATION	a		b		c		d	
				ft	in		ft	in	ft	in	ft	in	ft	in
A1e	Str.	9	8	39	7	Cap								
A2e	Str.	4	5	39	7	Cap Sides								
A3e	Str.	14	35	5	11	Cap Straps	2	7	2	8				
A4e	Str.	34	5	4	2	Cap Towels								
A5e	Str.	2	5	4	0	Wing A Vertical								
A6e	Str.	2	5	4	5	Wing A Vertical								
A7e	Str.	2	5	4	10	Wing A Vertical								
A8e	Str.	2	5	5	3	Wing A Vertical								
A9e	Str.	2	5	5	9	Wing A Vertical								
A10e	Str.	6	5	6	2	Wing A Vertical								
A11e	Str.	2	5	4	0	Wing B Vertical								
A12e	Str.	2	5	4	5	Wing B Vertical								
A13e	Str.	2	5	4	10	Wing B Vertical								
A14e	Str.	2	5	5	3	Wing B Vertical								
A15e	Str.	2	5	5	9	Wing B Vertical								
A16e	Str.	7	5	6	2	Wing B Vertical								
A17e	Str.	2	5	4	0	Diaphragm								
A18e	Str.	2	5	6	7	Diaphragm								
A19e	Str.	2	5	6	7	Diaphragm								
A20e	Str.	2	5	3	2	Diaphragm								
A21e	Str.	1	5	10	0	Wing A horizontal								
A22e	Str.	1	5	11	4	Wing A horizontal								
A23e	Str.	1	5	10	9	Wing A horizontal								
A24e	Str.	1	5	6	8	Wing A horizontal								
A25e	Str.	1	5	10	7	Wing B horizontal								
A26e	Str.	1	5	11	11	Wing B horizontal								
A27e	Str.	1	5	11	3	Wing B horizontal								
A28e	Str.	1	5	7	3	Wing B horizontal								
A29e	Str.	1	5	39	6	Long Diaphragm Bars								
A30e	Str.	1	5	39	6	Long Diaphragm Bars								
A31e	Str.	1	5	38	3	Long Diaphragm Bars								
A32e	Str.	1	5	33	7	Long Diaphragm Bars								
A33e	Str.	1	5	28	11	Long Diaphragm Bars								
A34e	2	11	5	11	4	Diaphragm	4	4	2	8				
A35e	5	12	5	8	10	Diaphragm Over Beams	4	4	4	6				
A36e	8	2	6	7	8.875	Wing A Top	5	7.375	2	1.5	0	10	1	11.5
A37e	8	2	6	8	8.875	Wing B Top	5	7.375	3	1.5	1	2.75	2	10.625



BAR TYPES

REVISION		DATE
DESIGNED BY: J. CROSSLIN		CHECKED BY: A. EDELEN
DETAILED BY: J. CROSSLIN		A. EDELEN
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
PERRY		
ROUTE N. FORK KENTUCKY RIVER		
END BENT 1 AND 2 BAR LIST		
PREPARED BY AECOM		
SHEET NO. 28190		

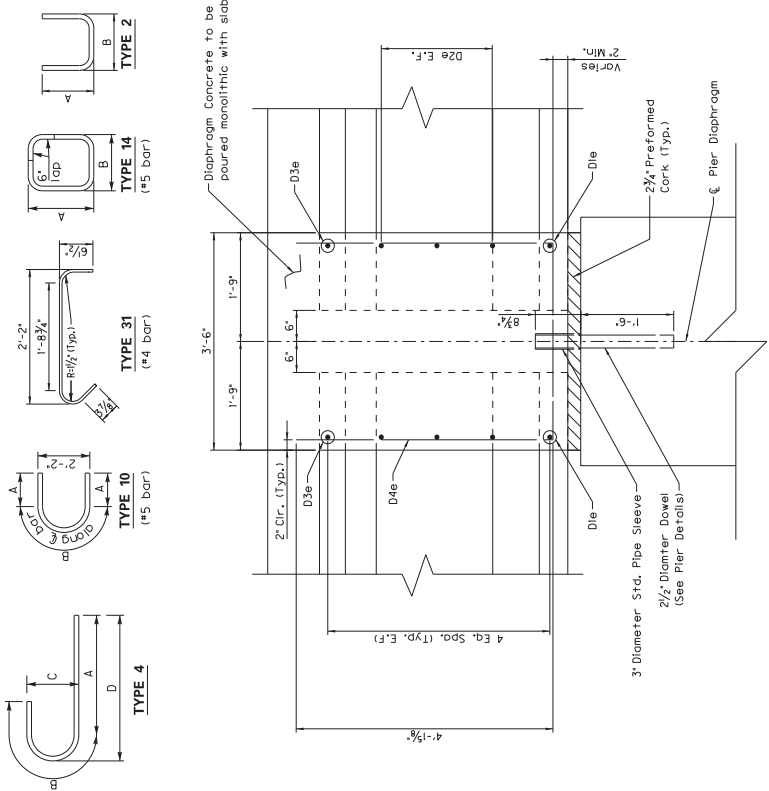
ITEM NUMBER	10-1113
-------------	---------



BILL OF REINFORCEMENT - PIER 1

Mark	Type	NUMBER REQD.	SIZE	Length ft	a ft	b ft	c ft	d ft
P1	Str	96	9	14				
P2	Str	58	11	28				
P3	Str	88	11	28				
P4	Str	4	88	11	12	4	1	2.75
P5	Str	54	5	19				
P6	Str	10	54	5	2	9	3	4
P7	Str	31	297	4	3			
P8e	Str	6	8	22	8			
P8e	Str	4	8	22	8			
P10e	Str	4	5	22	8			
P10e	Str	4	5	22	8			
P11e	Str	14	16	5	3	2	3	8
P12e	Str	4	2.5 inch	2	2.75			
D1e	Str	4	5	3	10			
D2e	Str	12	5	6	6			
D3e	Str	4	5	3	1			
D4e	Str	2	10	5	11	6		

Notes: P12e - 2 1/2" Smooth Round Bar. May be Commercial Grade Steel, Epoxy Coated
Note: Bars P8e to P12e and D1e to D4e are to be Epoxy Coated

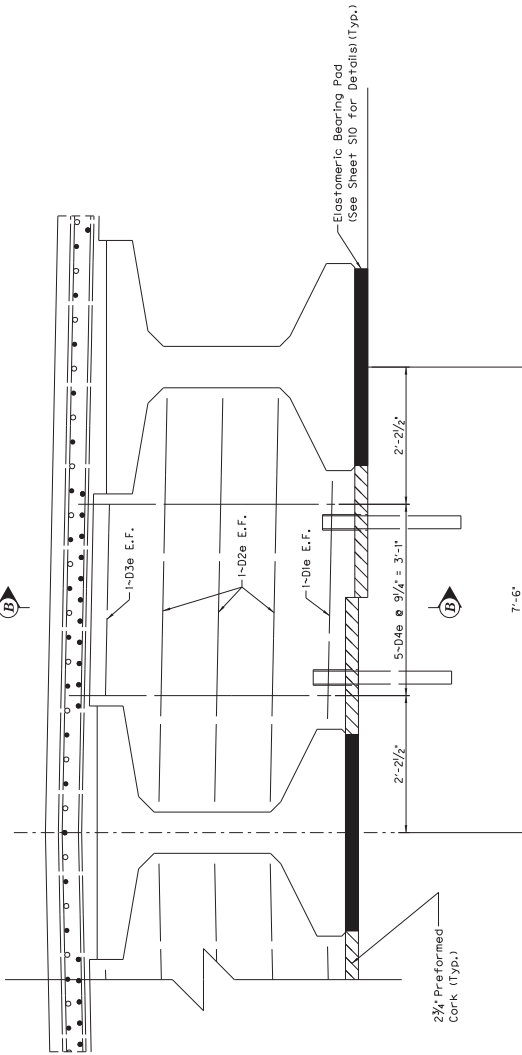


Section B-B

3" Diameter x 5' Pipe Sleeve shall be closed at one end.
Secure pipe sleeve to prevent floating while placing concrete.
Sleeve to sit on cork or styrofoam. Pipe sleeve to be
incidental to Class 'AA' Concrete.

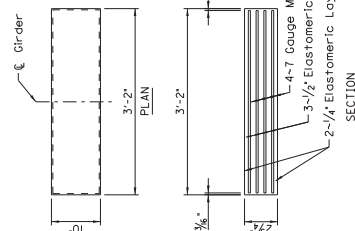
BILL OF REINFORCEMENT - PIER 2

Mark	Type	NUMBER REQD.	SIZE	Length ft	a ft	b ft	c ft	d ft
P1	Str	96	9	14				
P2	Str	58	11	28				
P3	Str	88	11	28				
P4	Str	4	88	11	12	4	1	2.75
P5	Str	54	5	19				
P6	Str	10	54	5	2	9	3	4
P7	Str	31	297	4	3			
P8e	Str	6	8	22	8			
P8e	Str	4	8	22	8			
P10e	Str	4	5	22	8			
P10e	Str	4	5	22	8			
P11e	Str	14	16	5	3	2	3	8
P12e	Str	4	2.5 inch	2	2.75			
D1e	Str	4	5	3	10			
D2e	Str	12	5	6	6			
D3e	Str	4	5	3	1			
D4e	Str	2	10	5	11	6		



TYPICAL PIER DIAPHRAGM


DATE: 12/21/2021	DESIGNED BY: A. EDELEN	CHECKED BY: J. CROSSLIN	DATE:
DETAILED BY: A. EDELEN	J. CROSSLIN		
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS			
PERRY			
ROUTE	Kenmont Road	CROSSING	N. FORK KENTUCKY RIVER
PIER DETAILS			
ITEM NUMBER	10-1113		
AECOM			
SHEET NO. 28190			



ELASTOMERIC PAD DETAIL

Notes:

- Notes:
1. Fabricate the Elastomeric Bearing Pads to the design and dimensions as shown on these drawings and to ASHTO LFRD Bridge Construction Specifications, Section 18.
 2. Ensure bearings are low temperature Grade 3 with durometer hardness of 50 and subjected to the load testing requirements corresponding to Design Method A.
 3. Include the cost of bearing pads and lead plates in the bid for the beams.

SHEET NO. C-28190			BRIDGING KENTUCKY TRANSPORTATION
SHEET NO. S10			
DATE: 12/21/2021		DATE: 12/21/2021	
DESIGNED BY: J. CROSSLIN		DESIGNED BY: J. CROSSLIN	
CHECKED BY: A. EDELEN		CHECKED BY: A. EDELEN	
DETAILED BY: J. CROSSLIN		DETAILED BY: J. CROSSLIN	
COMMONWEALTH OF KENTUCKY DEPARTMENT OF HIGHWAYS		COMMONWEALTH OF KENTUCKY DEPARTMENT OF HIGHWAYS	
COUNTY: PERRY		COUNTY: PERRY	
ROUTE: Kenmont Road		ROUTE: Kenmont Road	
CROSSING: N. FORK KENTUCKY RIVER		CROSSING: N. FORK KENTUCKY RIVER	
FRAMING PLAN		FRAMING PLAN	
PREPARED BY: AECOM		PREPARED BY: AECOM	
ITEM NUMBER: 10-1113		ITEM NUMBER: 10-1113	

General Notes

Ensure prestressed girder concrete is in accordance with these plans and the specifications.

MATERIALS DESIGN SPECIFICATIONS: For prestressed beams:
F_y = 60,000 psi F_c = 270,000 psi
Prestressing Reinforcement: Ensure that strands are 0.6" nominal diameter, A_s 0.21 sq. in., uncoated seven-wire stress relieved, low-relaxation conforming to AASHTO M 203, Grade 270. Billing of the cost for redesign of beam and subsequent plan modification shall be the responsibility of the original plans is type or arrangement of the design.

CONSTRUCTION METHODS: Protection all beams. Ensure concrete has attained full strength in the table standard test cylinders that are made and cured identically with the beams without bond stresses being transferred to the concrete or releasing the end anchors. Attain f_c shown in the table at or prior to 28 days. Apply an initial force of 43,943 lbs. per low-relaxation strand to develop a stress of 202,500 psi. No beam will be accepted unless it meets the following acceptance criteria: An allowance of 0.0005L is made for shortening of beams due to shrinkage and elastic change. Show a detensioning plan by sequential numbering of the strand pattern on the shop plans.

LIFTING DEVICES: Detail lifting devices on the shop plans. Loads are to be distributed equally to each device.

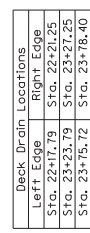
BEARING DEVICES: Include the price for lead plates and/or bearing pads in the bid for precast beams.

FABRICATION: The "Maximum Allowable Camber" shown on the beam sheet is the amount of camber measured prior to casting the deck above which the beam will begin to encroach into the slab. If the measured camber is greater than the "Maximum Allowable Camber," the contractor will be responsible for any necessary adjustments to assure a minimum slab thickness of eight (8) inches as shown in the plans. This work will be performed after completion of the structure and have the approval of the Engineer.

Strand Data with number indicated in rows		Beam Data (measured along centerline)																Maximum Allowable Camber	
		Dimensions																	
		Total																	
		No.																	
		A B C D E F G H I J K L M																	
		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17																	
AI		17	15	3	3	3	3	3	3	3	3	3	3	3	3	3	47	6000	8000
BI		17	15	3	3	3	3	3	3	3	3	3	3	3	3	3	47	6000	8000
CI		17	15	3	3	3	3	3	3	3	3	3	3	3	3	3	17	6000	8000

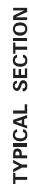
ELEVATION OF BEAM

Diagram showing the elevation of the beam with strand layout, dimensions, and hold-down points. Key features include: Strand hold-down points, Strand hold-down point, Strand



ITEM NUMBER
10-1113

[illegible]

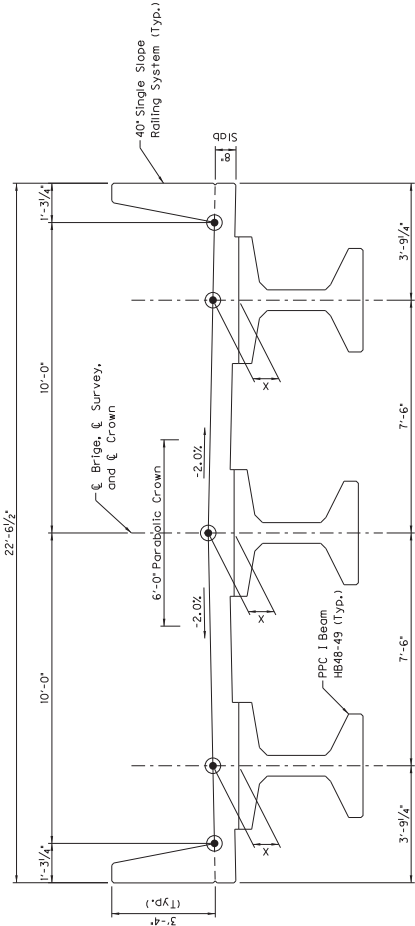


Mark	Type	NUMBER RECD.	SIZE		length		LOCATION	a		b		c		d	
			ft	in	ft	in		ft	in	ft	in	ft	in	ft	in
S1e	Sfr.	34	9	30	9.25		Slab - Top Longitudinal								
S2e	Sfr.	102	9	60	0		Slab - Top Longitudinal								
S3e	Sfr.	34	9	59	6		Slab - Top Longitudinal								
S4e	Sfr.	34	9	29	5.75		Slab - Top Longitudinal								
S5e	Sfr.	30	5	23	11		Slab - Btm Longitudinal								
S6e	Sfr.	90	5	60	0		Slab - Btm Longitudinal								
S7e	Sfr.	30	5	52	8		Slab - Btm Longitudinal								
S8e	Sfr.	30	5	26	1		Slab - Btm Longitudinal								
S9e	Sfr.	37	9	42	9		Slab - P1 Neg Moment								
S10e	Sfr.	37	9	56	3.5		Slab - P2 Neg Moment								
S11e	Sfr.	640	6	22	5		Slab - Top Transverse								
S12e	Sfr.	640	5	22	2.5		Slab - Btm Transverse								

ITEM NUMBER	PREPARED BY
10-1113	AECOM

[illegible]

● Denotes: Construction Elevations are Given at These Points.



TYPICAL SECTION

NOTES

Take elevations on top of girder at points indicated by the grid layout. The beam elevations are to be read to three decimals, and entered in the tables under "Top of Girder" elevations.

Compute dimension "X" as follows: "Construction Elevation" minus "Top of Girder" elevation equals dimension "X". Construction Elevations include camber due to weight of concrete slab, barrier, and future wearing surfaces. Measuring of dimension "X" gives the final check on beam tolerances for camber, girder damage, and errors in erection that produce reverse cambers, sags, and unsightly fascia girders.

The minimum allowable dimension "X" on a beam results in the design deck thickness (b) at the edge of the beam flange. This is calculated as the deck thickness "b" at the top flange width + the cross slope of the bridge. This is $8' \pm (24/2 \times 0.02) \pm 8.49' \pm 0.108'$. Any necessary modifications to some or all of the "X"-dimensions must meet approval of the Engineer.

For setting templates, measure dimension "X" above top of girders for top of template. Do not set template by elevations.

Temporary supports or shoring will not be permitted under the girders when pouring the concrete floor slab or when taking "Top of Girder" elevations.

Construct barrier curb to roadway grade. Do not add camber to barrier grade.

Note: The "Maximum Allowable Camber" shown on Sheet S11 is the amount of camber, measured prior to the casting of the deck, above which the beam will begin to encroach into the slab. If the measured camber is greater than the "Maximum Allowable Camber" the contractor will be responsible for any necessary adjustments to assure a minimum slab thickness of eight (8) inches as shown in the plans. This work will be considered incidental to the completion of the structure and have the approval of the Engineer.

REVISION		DATE
DESIGNED BY: J. CROSSLIN		CHECKED BY: A. EDELEN
DETAILED BY: J. CROSSLIN		A. EDELEN
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY PERRY		
ROUTE Kenmont Road		CROSSING N. FORK KENTUCKY RIVER
CONSTRUCTION ELEVATIONS		
PREPARED BY AECOM		SHEET NO. 28190



ITEM NUMBER
10-1113





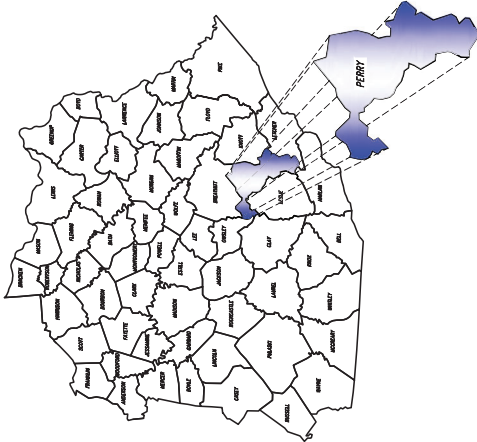
TABLE OF CONSTRUCTION ELEVATIONS

Line	CONST. EL.	LT Gutter TOP OF BEAM	DIM. "X"	CONST. EL.	G1 TOP OF BEAM	DIM. "X"	CONST. EL.	G2/PGL TOP OF BEAM	CONST. EL.	G3 TOP OF BEAM	DIM. "X"	CONST. EL.	RT Gutter TOP OF BEAM	DIM. "X"
A-A	895.358			896.407	5.000		895.553		896.399			896.348		
B-B	895.354			896.402			895.549		896.395			896.344		
C-C	895.067			896.116			895.263		896.109			896.058		
D-D	895.781			895.830			895.976		895.823			895.772		
E-E	895.642			895.691			895.837		895.684			895.633		
F-F	895.638			895.687			895.833		895.680			895.629		
1	896.356			896.404			895.549		*****			*****		
2	896.364			896.413			895.558		896.403			896.351		
3	895.365			896.414			895.560		896.407			896.356		
4	896.361	4		896.410			895.557		896.405			896.354		
5	896.355			896.404			895.552		896.400			896.349		
6	896.345			896.394			895.542		896.391			896.340		
7	896.329			896.379			895.528		896.377			896.327		
8	896.308			896.358			895.508		896.359			896.310		
9	896.282			896.332			896.484		896.335			896.285		
10	896.250			896.301			896.452		896.304			896.254		
11	896.213			896.264			896.416		896.269			896.220		
12	896.172			896.223			896.376		896.230			896.182		
13	896.125			896.176			896.332		896.187			896.138		
14	896.069			896.121			896.277		896.132			896.084		
15	896.083			896.131			896.275		896.119			896.066		
16	896.092			896.140			896.286		896.132			896.080		
17	896.094			896.143			896.289		896.136			896.084		
18	896.091			896.140			896.286		896.133			896.082		
19	896.081			896.131			896.278		896.127			896.076		
20	896.067			896.117			896.265		896.115			896.065		
21	896.046			896.096			896.247		896.098			896.047		
22	896.019			896.069			896.220		896.071			896.021		
23	895.984			896.035			896.186		896.039			895.990		
24	895.945			895.996			896.149		896.002			895.953		
25	895.902			895.953			896.107		895.962			895.913		
26	895.855			895.907			896.061		895.915			895.866		
27	895.797			895.849			896.005		895.861			895.813		
28	895.784			895.834			895.986		895.834			895.784		
29	895.781			895.831			895.985		895.831			895.781		
30	895.768			895.818			896.974		895.818			895.768		
31	895.746			895.796			895.952		895.796			895.746		
32	895.715			895.765			895.920		895.765			895.715		
33	895.676			895.678			895.878		895.726			895.676		
34	*****			*****			895.837		895.687			895.637		

DATE: 12/21/2021		REVISION		DATE	
DESIGNED BY: J. GROSSLIN		CHECKED BY: A. EDLEN			
DETAILED BY: J. GROSSLIN		A. EDLEN			
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS					
COUNTY: PERRY					
ROUTE		CROSSING		COUNTY	
Kernmont Road		N. FORK KENTUCKY RIVER			
CONSTRUCTION ELEVATIONS PREPARED BY:					
					
					
SHEET NO.				DRAWING NO.	
				28190.0	

KENNMONT ROAD WATERLINE RELOCATION PROJECT

FOR
PERRY COUNTY WATER AND SEWER
Perry County
FD04 097 94140 01U
Item No. 10-1113.00



DRAWING INDEX	
COVER SHEET	
U-1	GENERAL NOTES
U-2	LOCATION MAP
U-3	PLAN AND PROFILE SHEET
S-02	KYTC Preliminary Plan Sheet
U-4	EROSION AND SEDIMENT CONTROL DETAILS
U-5	STANDARD DETAILS



RMJE

R.M. JOHNSON ENGINEERING, INC.
3376 E HWY 550
P.O. Box 444
Hindman, KY 41822
(606)785-5926
3213 Summit Square Place
Suite 100
Lexington, KY 40509
(859)543-1256

SUBJECT:

SCALE:	AS NOTED
JOB NO.:	19-042
DESIGNED BY:	RDP
DETAILED BY:	RDP
CHECKED BY:	RMJ
DATE:	05-13-2020
COPYRIGHT © 2020 R.M. JOHNSON ENGINEERING, INC.	

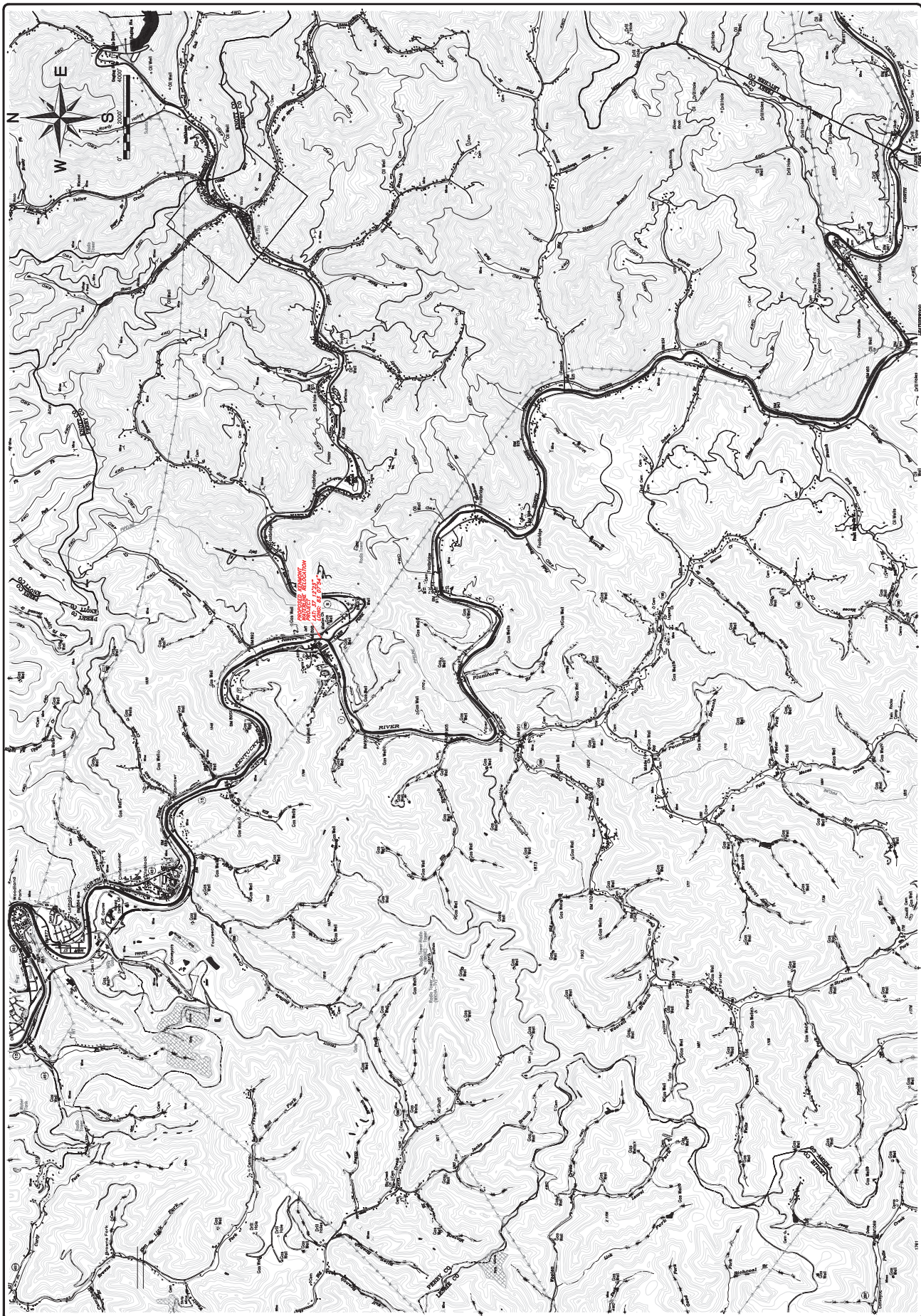


KENMONT ROAD WATERLINE RELOCATION PROJECT

PERRY COUNTY WATER AND SEWER

PO Box 249 Vico, Kentucky 41773

R.M.J.
R.M. JOHNSON ENGINEERING, INC.
3213 Summit Square Place
Suite 100
Lexington, KY 40509
(606) 785-5926
P.O. Box 444
Lexington, KY 41122
(606) 785-5926
(859) 543-1256



U-3





PRELIMINARY - NOT FOR CONSTRUCTION			DATE:	1/10/2020	DESIGNED BY:	J. GROSSLIN	CHECKED BY:	A. EDELEN
					DETAILED BY:	J. GROSSLIN		A. EDELEN
	<p align="center">Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS</p>							
					<p align="center">COUNTY PERRY</p>			
			SHEET NO.	CR 1114	TOWNSHIP	N. FORK KENTUCKY RIVER		
					LAYOUT			
<div style="display: flex; justify-content: space-between;"> <div> </div> <div> PREPARED BY: </div> </div>								
<div style="display: flex; justify-content: space-between;"> <div> </div> <div> </div> </div>								

RELIMINARY - NOT FOR CONSTRUCTION

Note: Rail System 40" Single Slope and Side Slot Drain details on KYC Sepia 053

COE OF SLOPE
DETAIL

R.M. JOHNSON ENGINEERING, INC. COPYRIGHT © 2020		06-22-2020
DATE: 05-13-2020		
CHECKED BY: RML		
DETAILED BY: ROP		
DESIGNED BY: ROP		
JOB NO.: 19-042		
SCALE: AS NOTED		
REVISIONS		



THRUST BLOCK FOR
GATE VALVE

SOFT-SANDY CLAY SOIL (BEARING STRENGTH = 2.0004 T/ft ²)									
PIPE SIZE	BEARING AREA ft ²	BEARING AREA in ²	70° F	70° F	BEARING AREA in ²	BEARING AREA ft ²	BEARING AREA ft ²	BEARING AREA ft ²	BEARING AREA ft ²
1 1/2"	0.33	0.18	12	12	0.18	0.18	0.18	0.18	0.18
2"	0.79	0.28	12	12	0.28	0.28	0.28	0.28	0.28
2 1/2"	1.12	0.41	12	12	0.41	0.41	0.41	0.41	0.41
3"	1.57	0.54	12	12	0.54	0.54	0.54	0.54	0.54
3 1/2"	1.96	0.67	12	12	0.67	0.67	0.67	0.67	0.67
4"	2.36	0.80	12	12	0.80	0.80	0.80	0.80	0.80
4 1/2"	2.79	0.93	12	12	0.93	0.93	0.93	0.93	0.93
5"	3.24	1.06	12	12	1.06	1.06	1.06	1.06	1.06
5 1/2"	3.71	1.19	12	12	1.19	1.19	1.19	1.19	1.19
6"	3.98	1.24	12	12	1.24	1.24	1.24	1.24	1.24
6 1/2"	4.47	1.37	12	12	1.37	1.37	1.37	1.37	1.37
7"	4.97	1.50	12	12	1.50	1.50	1.50	1.50	1.50
7 1/2"	5.49	1.63	12	12	1.63	1.63	1.63	1.63	1.63
8"	6"	6"	6"	6"	3.63	3.63	3.63	3.63	3.63
8 1/2"	6.70	4.00	60°	24"	5.41	5.41	4.47	4.47	4.47
9"	7.29	4.37	60°	24"	5.81	5.81	4.87	4.87	4.87
9 1/2"	7.89	4.74	60°	24"	6.21	6.21	5.27	5.27	5.27
10"	8.50	5.11	60°	24"	6.61	6.61	5.67	5.67	5.67
10 1/2"	9.12	5.48	60°	24"	7.01	7.01	6.07	6.07	6.07
11"	9.75	5.85	60°	24"	7.41	7.41	6.47	6.47	6.47
11 1/2"	10.39	6.22	60°	24"	7.81	7.81	6.87	6.87	6.87
12"	11.04	6.59	60°	24"	8.21	8.21	7.27	7.27	7.27
12 1/2"	11.70	6.96	60°	24"	8.61	8.61	7.67	7.67	7.67
13"	12.37	7.33	60°	24"	9.01	9.01	8.07	8.07	8.07
13 1/2"	13.05	7.70	60°	24"	9.41	9.41	8.47	8.47	8.47
14"	13.74	8.07	60°	24"	9.81	9.81	8.87	8.87	8.87
14 1/2"	14.44	8.44	60°	24"	10.21	10.21	9.27	9.27	9.27
15"	15.15	8.81	60°	24"	10.61	10.61	9.67	9.67	9.67
15 1/2"	15.87	9.18	60°	24"	11.01	11.01	10.07	10.07	10.07
16"	16.60	9.55	60°	24"	11.41	11.41	10.47	10.47	10.47
16 1/2"	17.34	9.92	60°	24"	11.81	11.81	10.87	10.87	10.87
17"	18.09	10.29	60°	24"	12.21	12.21	11.27	11.27	11.27
17 1/2"	18.85	10.66	60°	24"	12.61	12.61	11.67	11.67	11.67
18"	19.62	11.03	60°	24"	13.01	13.01	12.07	12.07	12.07

THRUST BLOCKS
(160 P.S.I. DESIGNED)
NOT TO SCALE

SPECIAL NOTE FOR TRAFFIC CONTROL ON BRIDGE REPAIR CONTRACTS

10-1113.00 Perry 097C00005N

I. TRAFFIC CONTROL GENERAL

Except as provided herein, traffic shall be maintained in accordance with the current standard specifications, section 112. The contractor will be responsible for developing and implementing the maintenance of traffic details with guidance through standard drawings and the MUTCD current editions. The developed traffic control plan must be approved by the Engineer prior to implementation. The contractor is expected to provide at a minimum the items listed in this note, however this note does not relieve the contractor of other items that may be necessary to comply with current standards. 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 new condition, at the beginning of the work and maintained in like new condition until completion of the work.

The contractor must notify the engineer and public information officer at least 14 calendar days prior to the beginning work. Please see the Special Note for Liquidated Damages for additional information.

II. TRAFFIC COORDINATOR

Furnish a traffic coordinator as per section 112. The traffic coordinator shall inspect the project maintenance of traffic, at least three times daily, or as directed by the engineer, during the contractor's operations and at any time a bi-directional lane closure or road closure is in place. The personnel shall have access on the project to a radio or telephone to be used in case of emergencies or accidents. The traffic coordinator shall report all incidents throughout the work zone to the engineer on the project. The contractor shall furnish the name and telephone number where the traffic coordinator can be contacted at all times.

III. SIGNS

The contractor is responsible for all signage during construction. The contractor shall adhere to the standard drawings and manual on uniform traffic control devices (MUTCD) for guidance. If, at any time, the engineer requests a change in the maintenance of traffic signage, the contractor shall implement the change within 8 hours. Failure to implement these changes within the required eight hours will result in liquidated damages of \$5,000 per day.

The contractor shall provide all detour signing needed for the bridge closure, if allowed in the contract documents. All signing required will be incidental to the lump sum bid item "Maintain and Control Traffic".

The department will not measure installation, maintenance, or removal for payment of any detour signage or standard construction signage, and will consider these incidental to “Maintain and Control Traffic”

Closure signs, detour signs, and bi-directional lane closure signs should be placed no sooner than two weeks prior to the closing of the bridge (when applicable) or placing lane closures.

Wayfinding detour signs should be placed a maximum of 2 miles apart unless specified by the engineer. Signs shall be covered or removed within 24 hours of opening the bridge to traffic.

Road closed signs (when applicable) should be double signed and placed a minimum of 1500’, 1000’, and 500’ in advance of the closure, in addition to signage required by the MUTCD and standard drawings.

IV. TEMPORARY PAVEMENT STRIPING

For projects where road closures are allowed in the contract documents, it is not anticipated that temporary pavement striping will be needed since the bridge will be closed. However, if the contractor’s means and methods allows for need for temporary striping, conflicting pavement marking will be covered with 6” black removable tape. However, for bi-directional lane closures or if the plans call for a diversion, temporary striping will be required per the plans and MUTCD. Contrary to the standard specifications, no direct payment will be made for any temporary striping, pavement striping removal, or any other temporary striping item. If temporary striping is used, the contractor shall replace any temporary striping that becomes damaged or fails to adhere to the pavement before dark on the day of the notification. Liquidated damages shall be assessed to the contractor at a rate of \$500 per day for failing to replace temporary striping within this time limit.

V. PROJECT PHASING & CONSTRUCTION PROCEDURES

Project phasing shall be as directed by the plans, special notes, and the approved Traffic Control Plan prepared by the contractor. Maintain traffic over the bridge as long as possible. Once work on the structure begins that impacts traffic, ensure work progresses to minimize the effected time to the public. All materials that must be made specific for the project should be ordered and made prior to closure of the bridge or implementation of bi-directional lane closures so that delivery does not delay progress of the work, unless approved by the Engineer. If the bridge is reopened prior to safety devices being in place, an approved protective barrier wall shall be placed in accordance to the standard drawings. Contrary to standard specifications, no direct payment would be made for the barrier wall and will be considered incidental to “Maintain and Control Traffic”.

For projects which require an on-site diversion to be constructed to maintain traffic, the traffic control plan and project schedule prepared by the contractor shall include provisions such that traffic is not switched to the diversion until all materials that must be made specific for the project are ordered and made so that use of the diversion is minimized, unless approved by the Engineer.

VI. PAVEMENT DROP-OFF

Less than two inches - no protection required. Warning signs should be placed in advance and throughout the drop-off area.

Two to four inches - plastic drums, vertical panels or barricades every 100 feet on tangent sections for speeds of 50 mph or greater. Cones may be used in place of plastic drums, panels and barricades during daylight hours. For tangent sections with speeds less than 50 mph and curves devices should be placed every 50 feet. Spacing of devices on tapered sections should be in accordance with the manual on uniform traffic control devices, current edition.

Greater than four inches - positive separation or wedge with 3:1 or flatter slope needed. If there is five feet or more distance between the edge of the pavement and the drop-off, then drums, panel, or barricades may be used. If the drop-off is greater than 12 inches, positive separation is strongly encouraged. If concrete barriers are used, special reflective devices or steady burn lights should be used for overnight installations.

For temporary conditions, drop-offs greater than four inches may be protected with plastic drums, vertical panels or barricades for short distances during daylight hours while work is being done in the drop-off area.

VII. VARIABLE MESSAGE SIGNS AND TEMPORARY TRAFFIC SIGNALS

At the direction of the Engineer, the contractor is expected to provide up to four (4) message boards for use at locations determined by the Engineer. These message boards are expected to be in place one week prior to the closure of the roadway and remain in place for the duration of the closure. The message boards will be paid for as per the standard specifications.

For projects that involve the use of lane closures, all lane closures shall be bi-directional. The contractor shall provide temporary traffic signals and all labor, materials, and incidentals needed to maintain bi-directional traffic for the project. For short term bi-directional lane closures, the use of flaggers in lieu of temporary traffic signals may be acceptable if approved by the Engineer.

VIII. BARRICADES

For projects which allow full closure, ensure a minimum of (4) type III barricades are used at each end of the bridge for a total of (8) type III barricades. Contrary to the standard specifications, no direct payment will be made for barricades but they will be included in the lump sum price for "Maintain and Control Traffic".

VIII. DETOUR AND ON SITE DIVERSIONS

For projects which allow a full closure of the bridge, or if necessary to detour trucks, the traffic control plan proposed by the contractor shall include a signed detour route for the road closure. The traffic control plan along with the proposed detour plan will be delivered to the engineer 7

days prior to the pre-construction meeting. The proposed detour route shall meet the following requirements:

- 1) Detour routes must remain at minimum on the same classification of roadway (i.e. AA, AAA, state, county, etc.) Unless written approval is obtained through the owner of the facility.
- 2) The contractor must coordinate with other projects along the detour route in order to avoid ongoing construction projects along those routes.
- 3) It may be determined that two detour routes would be needed if the first selected route cannot accommodate truck traffic. If this occurs, the contractor is expected to sign both detours per the standard drawings and MUTCD. Additional clarification signage between the detours may be needed at points where they diverge.
- 4) For projects that involve the use of bi-directional lane closures and the temporary lane width per the plans or as proposed by the contractor is less than 10 feet, the contractor shall be required to provide a signed detour for oversized vehicles.

The traffic control plan must be submitted and approved to allow for coordination of the public information officer with the closure notification. The public must be notified of the proposed detour route when they are notified of the closure, 2 weeks before closure. All time and expenses necessary for the development of the detour plan(s) will be incidental to the lump sum bid item "Maintain and Control Traffic".

For projects with an on-site diversion included in the construction, the preparation of traffic control plans for a detour and implementation of a detour will not be required, unless specified in the plans.

IX. PAYMENT

Unless listed as a bid item in the contract documents, payment will only be made for the following items:

1. Portable Changeable Message Boards - Each
2. Maintain and Control Traffic - Lump Sum

All other items needed to maintain traffic in accordance with these contract documents and the approved traffic control plan shall be considered incidental to Maintain and Control Traffic. These items include but are not limited to traffic signals, signs, barrier wall, crash cushions, temporary guardrail, temporary and permanent pavement striping, cones, barrels, flaggers, etc.

SPECIAL NOTE FOR PLACING BRIDGE OVERLAY APPROACH PAVEMENT

10-1113.00 Perry 097C00005N

I. DESCRIPTION

Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's current Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the Contract Documents. Section references are to the Standard Specifications.

This work consists of the following:

1. Furnish all labor, materials, tools, and equipment.
2. Removal of existing abutment backfill, if needed.
3. Structural Granular Backfill, as needed.
4. Mill the existing pavement.
5. Place new DGA, asphalt base, and asphalt surface
6. Repair the roadway shoulders, if needed.
7. Provide Pavement Markings if needed.
8. Any other work specified as part of this contract.

II. MATERIALS

- A. Structural Granular Backfill.** See Section 8.05.11
- B. DGA.** See Section 302.
- C. Tack Coat.** This material shall be in accordance with the Standard Specifications.
- D. CL2 ASPH BASE 1.0D PG 64-22.** See Standard Specifications
- E. ASPHALT LEVEL AND WEDGE.** See Standard Specifications
- F. CL2 ASPH SURF 0.38D PG 64-22.** This material shall be in accordance with the Standard Specifications.
- G. GRANULAR EMBANKMENT.** This material shall be in accordance with the Standard Specifications.
- H. Pavement Striping.** See Section 713.

III. CONSTRUCTION – DECK, SUPERSTRUCTURE, AND FULL BRIDGE REPLACEMENTS

- A. Foundation Preparation.** For projects involving the removal and replacement of the asphalt and backfill behind the existing abutments and new abutments or end bents, the required excavation, geotextile fabric Class 1 or 2, 4" perforated pipe, and new backfill as shown in Figure 1 as well as any excavation and grading needed to shape the bridge approaches to match the existing roadway template, will be paid for by the bid item for Foundation Preparation. See Special Provision 69 and the Standard Drawings regarding additional construction details as required.

Backfill material used behind newly constructed abutments on county routes may be constructed with Type III soil backfill. All existing abutments, abutments on state routes, and newly constructed or existing bents must be backfilled with material meeting Structural Granular Backfill specifications.

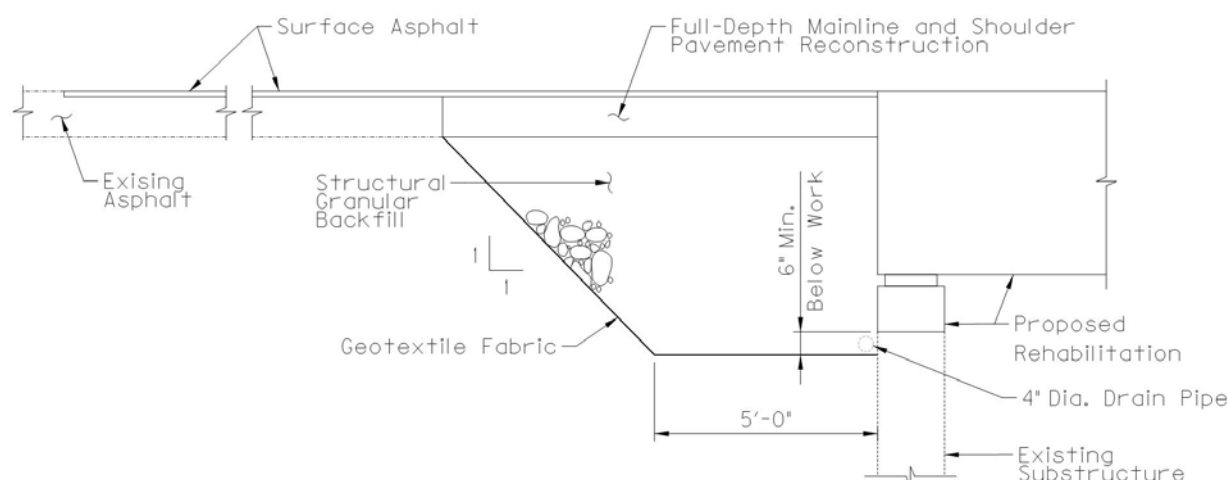


Figure 1: Detail showing proposed work for deck and superstructure replacements

- B. Remove Existing Asphalt Surface.** Remove the existing pavement material beyond the limits of full depth asphalt replacement to provide for a minimum of 1¼" new pavement surface from the bridge end extending approximately 25 feet, or as shown in the plans, into the approach pavement and across the width of the approach pavement. The Engineer shall determine the actual length and width of the milling depending on site conditions at each bridge approach. Mill the existing surface so that the new asphalt surface will match the elevation of the end of the full depth asphalt replacement and the bridge end. The Engineer shall approve the Contractor's plan for restoring the approach grade prior to the removal of the existing surface. Dispose of all removed material entirely away from the job site or as directed by the Engineer.
- C. Produce and Place New Asphalt Base.** Replace any full depth mainline and shoulder pavement removed as part of bridge backwall construction, superstructure replacement, or other work (if included in the Contract Documents) with a minimum of 8 inches of DGA, placed in two lifts of 4 inches each compacted and 8 inches of CL2 ASPH BASE 1.0D PG 64-22, placed in two lifts of 4 inches each compacted. Final elevation of the Asphalt Base at the approaches to match the width and new elevation of the riding surface on the bridge less the New Asphalt Surface to be placed. Shoulders shall receive identical treatment to the mainline pavement.
- D. Produce and Place New Asphalt Surface.** Apply an asphalt tack coat in accordance with Section 406. Produce and place the new 1 ¼" Asphalt Surface in accordance with Section 403 and compact under Option B. The new asphalt surface mixture required for this project shall be "CL2 ASPH SURF 0.38D PG 64-22". Place the new asphalt surface to smoothly connect the existing roadway grade at the end of the project, and/or the new abutment backwall.
- E. Granular Embankment for Guardrails.** When necessary to ensure compliance with standards, widen shoulders behind guardrail with granular embankment and cap with

DGA in accordance with plans or as directed by the Engineer. Remove existing topsoil as needed and place embankment in a manner to ensure proper compaction.

- F. Pavement Markings.** Pavement striping will be required to match the existing pavement striping on both approaches and the structure. Pavement striping shall be in accordance with applicable sections of the Standard Specifications and shall be incidental to the work. Raised pavement markers within the limits of the "Bridge Overlay Approach Pavement" shall be removed prior to the milling operation. The marker castings shall be cleaned and returned to the Engineer.

IV. CONSTRUCTION – OVERLAY PROJECTS

- A. Remove Existing Materials.** Remove the existing pavement material to provide for a minimum of 1¼" new pavement surface from the bridge end extending approximately 25 feet, or as shown in the plans, into the approach pavement and across the width of the approach pavement. The Engineer shall determine the actual length and width of the milling depending on site conditions at each bridge approach. Mill the existing surface so that the new asphalt surface will tie into the new armored edge, if applicable, and matches the elevation of the bridge end. The Engineer shall approve the Contractor's plan for restoring the approach grade prior to the removal of the existing surface. Dispose of all removed material entirely away from the job site or as directed by the Engineer.
- B. Mainline and Shoulder Reconstruction.** Replace shoulders in kind at the approaches to match the width and new elevation of the riding surface on the bridge. Shoulders shall receive identical treatment to the mainline pavement.
- C. Produce and Place New Asphalt Surface.** Apply an asphalt tack coat in accordance with Section 406. Produce and place the new 1 ¼" Asphalt Surface in accordance with Section 403 and compact under Option B. The new asphalt surface mixture required for this project shall be "CL2 ASPH SURF 0.38D PG 64-22". Place the new asphalt surface to smoothly connect the existing roadway grade at the end of the project and the bridge end.

For bridge decks specified to receive a new asphalt overlay as part of the work, place asphalt level and wedge and CL2 ASPH SURF 0.38D PG 64-22 as detailed in the plans to smoothly connect to the bridge approaches. If plans call for use of a waterproof membrane, this shall be addressed as a separate bid item.

- D. Granular Embankment for Guardrails.** When necessary to ensure compliance with standards, widen shoulders behind guardrail with granular embankment and cap with DGA in accordance with the plans or as directed by the Engineer. Remove existing topsoil as needed and place embankment in a manner to ensure proper compaction.
- E. Pavement Markings.** Pavement striping will be required to match the existing pavement striping on both approaches and the structure. Pavement striping shall be in accordance with applicable sections of the Standard Specifications and shall be incidental to the work. Raised pavement markers within the limits of the "Bridge

Overlay Approach Pavement” shall be removed prior to the milling operation. The marker castings shall be cleaned and returned to the Engineer.

V. MEASUREMENT

- A. Granular Embankment: The Department will measure the quantity in cubic yards. The Department will measure along the centerline to determine a linear foot of placement multiplied by a theoretical cross section of 12 square feet to achieve the quantity per side of the roadway.
- B. Bridge Overlay Approach Pavement: The Department will measure the quantity of in square yards. The Department will measure along the centerline from each end of the limits of the work as detailed on the plans to the point where the new pavement ties into the exiting pavement and across the width of the new pavement perpendicular to the centerline of the roadway.
- C. Foundation Preparation: See Section 603.

VI. PAYMENT

- A. Granular Embankment: Payment at the contract unit price per cubic yard of granular embankment is full compensation for granular embankment and DGA used for widening the shoulder for guardrail as directed. Variance of actual cross sectional quantities versus theoretical quantities will not be considered for additional payment.
- B. Bridge Overlay Approach Pavement: Payment at the contract unit price per square yard of is full compensation for removing existing pavement markers, mobilization of milling equipment, removing specified existing pavement material, reconstruct shoulders as needed, furnishing and installing the asphalt tack coat, producing and placing the new asphalt and DGA, and all incidental items necessary to complete the work within the specified pay limits as specified by this note and as shown in the Contract Documents.
- C. Foundation Preparation: See Section 603. Payment for Structural Granular Backfill or Type III soil backfill to be incidental to Foundation Preparation.

<i>Code</i>	<i>Pay Item</i>	<i>Pay Unit</i>
02223	Granular Embankment	Cubic Yards
03304	Bridge Overlay Approach Pavement	Square Yards
08803	Foundation Preparation	Lump Sum

The Department will consider payment as full compensation for all work required.

SPECIAL NOTE FOR CONCRETE SEALING

10-1113.00 Perry 097C00005N

These Notes or designated portions thereof, apply where so indicated on the plans, proposals or bidding instruction.

- I. DESCRIPTION.** Perform all work in accordance with the Department's current Standard Specifications, and applicable Supplemental Specifications, the attached sketches, and these Notes. Section references are to the Standard Specifications.

This work consists of:

1. Furnish all labor, materials, tools, equipment, and incidental items necessary to complete the work.
2. Provide safe access to the bridge, in accordance with Section 107.01.01, for the Engineer to sound possible repair areas and for workers to complete the construction.
3. Repair cracks as applicable in accordance with the Special Note for Epoxy Injection Crack Repair.
4. Repair delaminated or spalled areas as applicable in accordance with the Special Note for Concrete Patching.
5. Apply Ordinary Surface Finish
6. Prepare the surfaces to receive sealing.
7. Apply concrete sealing.
8. Any other work as specified as part of this contract.

II. MATERIALS.

- A. Sealer.** Use one of the following:

Product	Supplier
Protectosil BHN	Evonik Industries
Protectosil 300S	Evonik Industries
TK-590-40 Tri-Silane 40%	TK Products
SW-244-100	Chemical Products Industries, Inc.
TK-590-1 MS Tri-Silane	TK Products
MasterProtect H1000	BASF
Aquanil Plus 40	ChemMasters
SIL-ACT ATS-100	Advanced Chemical Technologies
Certivex Penseal BTS 100%	Vexcon
Pentreat 244-40	W.R. Meadows
Aquanil Plus 40A	ChemMasters

- B. Coverage Rate:** Follow all manufacturers recommendations for coverage rates except the application rate must not exceed the square footage coverage rate per gallon of sealer as given in the chart below. If the manufacturer recommends a coverage rate greater than given in the table below, apply sealer at the rate given in the table below for the chosen sealers silane percentage.

% Silane	Coverage rate (ft ² /gallon)
100	300
40	120
20	60

III. CONSTRUCTION.

- A. Perform Concrete Repairs.** Repair concrete surface in accordance with the Special Note for Epoxy Injection Crack Repair and/or the Special Note for Concrete Patching Repair if included in the contract documents.
- B. Curing Compound.** Contrary to Section 609.03.12 of the specifications, curing compound is not to be used on the deck due to potentially causing issues with the concrete sealer. During the deck pour, finishing, and tining operations the Class AA concrete shall be kept continuously moist with the use of a mister until burlap or curing blankets are applied to the surface. At no point should water be pooling or running off the surface or the surface of the concrete be allowed to become dry. After the burlap or curing blankets are installed, cure in accordance with the specifications. Include all costs in the unit price bid for Class AA concrete. Failure to properly cure the concrete in accordance with this note and the specifications may result in weakened or cracked concrete. If the concrete is weakened or cracked due to improper curing, the contractor will be responsible for providing alternates to fix the issues to the Engineer for review and the contractor will be solely responsible for all costs to do so, up to complete replacement. Do not begin any construction on fixing any issues without approval of the Engineer.
- C. Apply Ordinary Surface Finish.** In addition to new concrete, areas receiving epoxy injection, concrete patching, and other surface imperfections, including areas of minor cracking, should receive Ordinary Surface Finish in accordance with Section 601.03.18 of the Standard Specifications. Existing structural items not newly placed, patched, or repaired may be exempt from Ordinary Surface Finish. Use mortar of the same cement and fine aggregate as the concrete patching, or as directed by the Engineer. Payment will be incidental to Concrete Sealing. Finish surface of bridge decks in accordance with Section 609 of the Standard Specifications.
- D. Areas to Receive Concrete Sealing:**
1. Every exposed surface above a point 6" below ground or fill line of abutments, wing walls, end bent and pier caps, pedestals, back walls, columns, and exposed footings.

2. All exposed surfaces of concrete deck, barrier walls, parapets, curbs, and plinths.
 3. Prestressed Concrete I-Girders, Concrete Beams, and Spread Prestressed Concrete Box Beams: The underneath surfaces of slab overhangs outside of exterior concrete girders and to the exterior side and bottom of exterior concrete girders and beams.
 4. Adjacent Prestressed Concrete Composite Box Beams: Full length of the exterior face of all exterior beams from the top of the box beam to 1'-0" underneath the beams.
 5. Prestressed Non-Composite Box Beams: All faces of all beams, excluding surfaces to be covered with a waterproofing membrane. Take care to ensure that the grout pockets are not sealed.
 6. If the contract documents include the Special Note for Concrete Coating, do not apply concrete sealer to the areas where Concrete Coating is specified.
- E. Cleaning the Concrete Surfaces to be sealed.** Dry clean the concrete to remove all loose debris. Remove all visible hydrocarbons from the surface with detergent approved by the manufacturer of the deck sealant. Pressure wash all surfaces to be sealed at 2000 to 3000 psi. Install pressure gauges at each wand to verify pressure. Use 30° fan tip or as recommended by the manufacturer of the sealant. Hold pressure washing wand a minimum of 45° from the surfaces with a maximum stand-off distance of 12 inches.
- F. Sealing the Concrete.** Allow new concrete to cure a minimum 28 days prior to application of sealer. Monitor weather conditions prior to sealer application. Refer to manufacturer's recommendations for proper ambient conditions. Do not apply sealer if precipitation is anticipated within the time stated by the manufacturer. Allow the concrete to dry 24 hours (after washing or rain event) before sealer application. The bridge deck can be reopened to traffic while drying. Sealer must be applied within 48 hours of washing or the concrete must be rewashed. Divide the concrete into predefined areas of specific square footage to aid in determining usage. Comply with manufacturer's usage recommendation. Using a low-pressure pump, apply sealer and spread evenly with broom or squeegee; do not allow pooling to remain. When each predefined area is complete, measure the amount of sealer used to verify proper usage. After sealing, follow manufacturer's recommended cure time before opening to traffic. On vertical surfaces, apply the sealer in a flooding application from the bottom up, so the material runs down 6 to 8 inches below the spray pattern.
- G. Inspection:** Monitor all aspects of the project to assure compliance to this specification. Observe and document general conditions during the entirety of the project. Verify that each phase of work has been satisfactorily completed prior to beginning the next phase. Phases are described as follows:
1. Dry cleaning to remove loose debris, verify and document:
 - a. All debris has been removed and disposed of properly.
 2. Removal of hydrocarbons, verify and document:

- a. The manufacturer's recommended detergent is used for removal.
- b. Hydrocarbons have been satisfactorily removed.
- 3. Pressure washing, verify and document:
 - a. Washing pressure at the wand.
 - b. Tip size used.
 - c. Wash angle and stand-off distance.
 - d. The concrete is satisfactorily cleaned.
- 4. Sealer application, verify and document:
 - a. Proper cure time for new concrete.
 - b. Concrete surface is dry.
 - c. Document time since washed.
 - d. Was the bridge deck opened to traffic after washing?
 - e. Document ambient temperature, surface temperature, relative humidity, and dew point.
 - f. Application and distribution method.
 - g. Coverage to be complete and even.
 - h. Material is not allowed to remain pooled.
 - i. Monitor material usage.
 - j. No traffic on the bridge decks until proper cure time is allowed.

IV. MEASUREMENT

- A. Concrete Sealing.** The Department will measure the quantity per square feet of each area sealed.

V. PAYMENT

- A. Concrete Sealing.** Payment at the contract unit price per square feet is full compensation for the following: (1) Furnish all labor, materials, tools, and equipment; (2) Cleaning; (3) Sealing; (4) Maintain & control traffic; and, (5) Any other work specified as part of this contract.

February 5, 2019

SPECIAL NOTE FOR BRIDGING KENTUCKY PROJECT STENCIL

10-1113.00 Perry 097C00005N

This Special Note will apply to the bridge or bridges in this proposal. Section references herein are to the Department’s Current Standard Specifications for Road and Bridge Construction.

1.0 DESCRIPTION. This specification covers an additional concrete stencil for structures in the Bridging Kentucky Program.

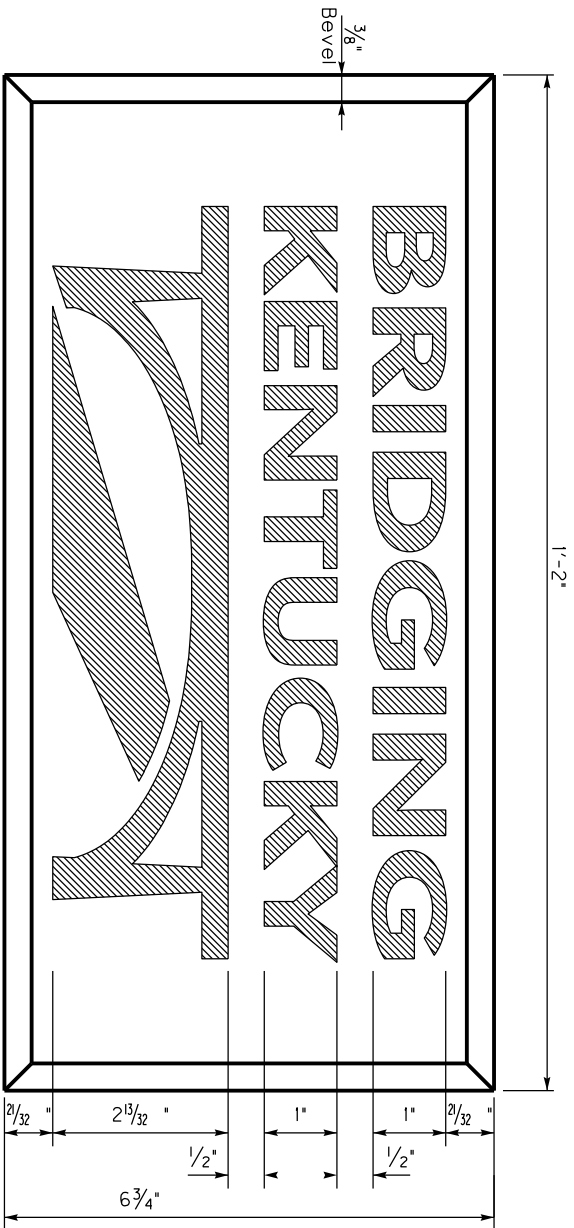
2.0 CONSTRUCTION.

2.1 Construction Date and Identification. On all concrete bridges and box culverts, stencil the year the Contract was executed, the structure drawing number on the concrete at the locations designated, and the Bridging Kentucky Logo as depicted in the drawing in this special note. Make the figures on the stencil according to details specified in the drawing. For bridges having a clear span of 20 feet or more, stencil the year the Contract was executed and load capacity of the structure on the outside face of the plinth or barrier wall as shown on the drawing. On all box culverts, place stenciled figures giving the year in which the Contract is executed on the inlet end of the culvert on the outside face and center of the parapet or headwall. Do not use permanent plates or markers of any kind, other than those shown, on any structure. On all bridges, imprint the name of the prime contractor in the concrete at the location shown. Furnish stencils, all equipment, tools, labor, materials, and other incidentals necessary.

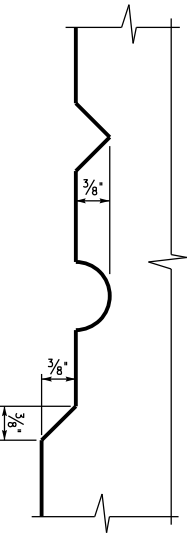
3.0 MEASUREMENT. The Department will not measure bridge stencils for payment per section 601 of the Kentucky Transportation Cabinet Standard Specifications for Road and Bridge and Construction, latest edition.

4.0 PAYMENT. The Department will not make payment for bridge stencils, materials, and associated work. All work, materials, and associated costs shall be incidental to the item listed:

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
08100, 08102-08106, 02555	Concrete, Class	Cubic Yard



STENCIL FOR BRIDGING KENTUCKY LOGO



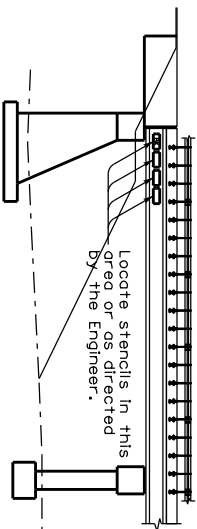
TYPE OF LETTERS

GENERAL NOTES

STENCILS: For concrete applications, fabricate all stencils from recessed panels with beveled edges with raised letters and figures in accordance with Subsection 601.03.19 of the Specifications. For steel girders, point stencil using flat block paint and the recommended dimensions. When using paint, borders shown in the above detail are to be excluded.

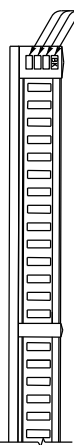
BRIDGING KENTUCKY LOGO STENCIL: Place on all program bridges when applicable. In proximity to other stencils required.

LOCATION OF STENCILS ON BRIDGES



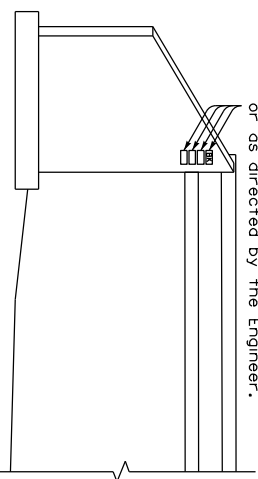
APPLICATION ON STEEL GIRDERS

Locate stencils in this area or as directed by the Engineer.



APPLICATION ON CLASSIC RAIL

Locate stencils in this area or as directed by the Engineer.



APPLICATION ON WING WALLS

KENTUCKY DEPARTMENT OF HIGHWAYS
STENCIL FOR BRIDGING KENTUCKY LOGO
BRIDGING KENTUCKY <small>Reinforced Concrete Bridge</small>



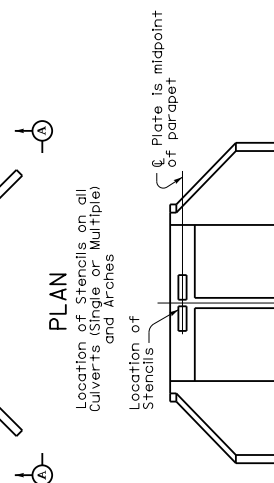
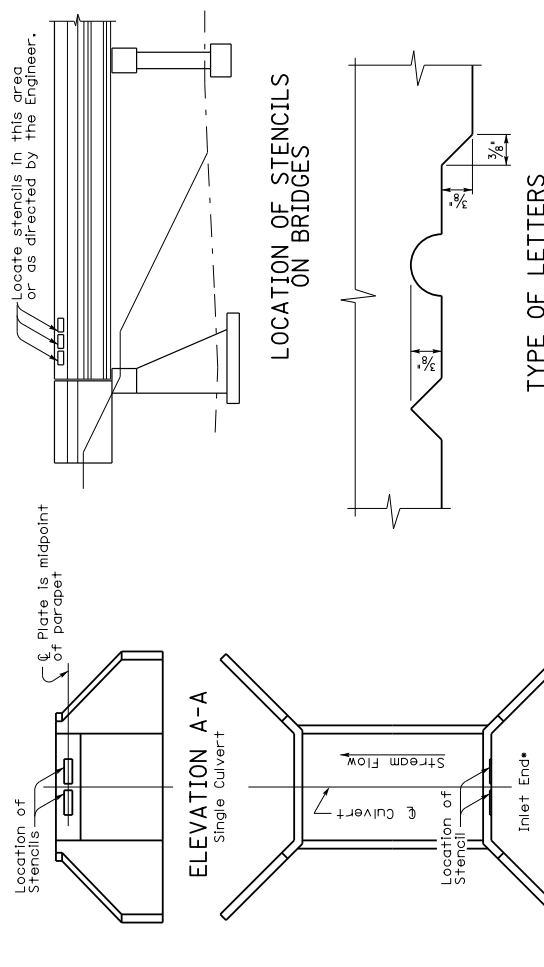
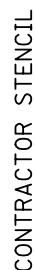
GENERAL NOTES

STENCILS: Fabricate all stencils from recessed panels with beveled edges with ENGRAVED LETTERS AND FIGURES in accordance with Subsection 601.03.19 of the Specifications.

YEAR AND DESIGN STENCIL: Show the year that the contract is executed and the design load as shown on the contract plans. The design load is required on all structures classified as bridges by Subsection 101.03 of the Specifications and on other structures as referenced on plans.

DRAWING NUMBER STENCIL: Use this stencil on all structures. The number to be placed on the stencil shall be taken from the contract plans.

CONTRACTOR STENCIL: Place on all bridges, the name of the prime contractor and subcontractor(s), when applicable, in proximity to other stencils required.



ELEVATION A-A
Multiple span Culvert

KENTUCKY

DEPARTMENT OF HIGHWAYS

STENCILS

FOR STRUCTURES

STANDARD DRAWING NO. BCX-006-10

SUBMITTED *Mad. Jnt.*

DIRECTOR, KENTUCKY DEPARTMENT OF HIGHWAYS

APPROVED *[Signature]*

STATE HIGHWAY ENGINEER

12-01-15

DATE

12-01-15

DATE

STRUCTURAL DESIGN

SPECIAL NOTE FOR STRUCTURE REMOVAL

10-1113.00 Perry 097C00005N

I. DESCRIPTION

Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's current Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, this Note, and the Contract Documents. Section references are to the current Standard Specifications.

Furnish all labor, materials, tools, and equipment to complete the work, which includes:

- Limited clearing; tree removal and/or trimming.
- Existing concrete bridge deck removal/disposal.
- Existing bridge superstructure removal, salvage, and transport/delivery to new site.
- Removal of existing bridge abutments and piers.

II. CONSTRUCTION

- A. **Clearing and Grubbing.** Clearing shall be limited to only areas needed for access and for the bridge removal and construction of new bridge and approaches. Work includes any necessary tree removal and tree trimming.
- B. **Remove Structure and Transport.** Perform all work necessary for removal of the existing two-span steel pony truss bridge with concrete deck in accordance with Section 203 of the Standard Specifications and this *Note*.
 1. Remove existing concrete bridge deck and dispose at an approved waste area off project site.
 2. The remaining bridge superstructure (two separate trusses) shall be partially disassembled in a careful manner and removed, without damage, in transportable sections. The truss in the better condition, as determined by the engineer, shall be hoisted onto the transport trailer. (Note: At contractor's option superstructure can be removed, loaded, and transported as an existing whole intact unit.) If superstructure is loaded/shipped either as a whole unit, as individual trusses, or as truss sections, take appropriate measures to prevent bending of the trusses. Removal of members shall be conducted in a manner that will facilitate reconstruction at a new site. Before removing/disassembling the superstructure match-mark the sections with paint. Provide written documentation (PDF file format) of the individual sections along with a digital photograph of each connection with the match-mark visible. Provide any temporary bracing as needed to stabilize and secure trusses for transport and offloading. The remaining truss shall remain the property of the contractor and shall be disposed of in accordance with the current specifications.
 3. Transport superstructure to the new bridge owner's facility address noted

below, and carefully unload at storage location as designated by facility representative. Provide two weeks minimum notice to new bridge owner for coordination of delivery (Note: Reconstruction of bridge at new site will be the responsibility of the new bridge owner.) Contact information and address:

New Bridge Location:West Liberty Park
Old Mill Park Lane
West Liberty, KY 41472
[37°55'26.1"N 83°15'41.3"W](#)

Facility Owner:City of West Liberty
565 Main St, West Liberty, KY
41472

Contact: Amy Williams, City Clerk
Phone: (606) 743-3330 or 606-477-2691

4. Remove completely the existing abutments and piers.
5. Immediately remove any material that enters stream due to the bridge removal from the waterway. All other material/debris from structure removal shall be removed from project site prior to project completion.

III. MEASUREMENT

- A. **Clearing and Grubbing.** This item will be measured as lump sum and includes any tree removal and/or tree trimming necessary for existing structure removal and construction of new bridge.
- B. **Remove Structure and Transport.** This item will be measured as lump sum and includes all work outlined in this Note in addition to the requirements in Section 203 of the Standard Specifications and any permits necessary for transport.

IV. PAYMENT

Unless listed as a bid item in the contract documents, payment will only be made for the following items:

- A. 02545Clearing and GrubbingLump Sum
- B. 02731Remove Structure and TransportLump Sum

The Department will consider payment as full compensation for all work required to satisfactorily complete the project.

PLAN SHEETS

PLAN SHEETS WHICH ARE TO SCALE ARE AVAILABLE TO VIEW AND PRINT IN THE PROJECT-RELATED INFORMATION FOLDER FOR THIS LETTING AT THE CONSTRUCTION PROCUREMENT WEBSITE:

<http://transportation.ky.gov/Construction-Procurement/Pages/default.aspx>

SPECIAL NOTE

FOR EROSION PREVENTION AND SEDIMENT CONTROL

FOR IMPACT REGARDLESS OF SIZE OF THE DISTURBED AREA

Potential impacts to gray bat foraging habitat and habitat for federally listed fish and mussel species will be minimized by implementing erosion prevention and sediment control measures.

As required under Section 213 of the KYTC Standard Specifications, prior to onsite activities a **site-specific Erosion Control Plan including BMPs** to ensure continuous erosion control throughout the construction and post construction period. The plan will identify individual Disturbed Drainage Areas (DDA) where storm water from the construction area will be discharged off site or into waters of the Commonwealth.

Should the Contractor fail to create a BMP Plan or provide and maintain the necessary erosion control, Liquidated Damages will apply at the rate specified in the contract. If no rate is specified, Liquidated Damages will be applied at the rate specified in Section 108 of the Standard Specifications.

The erosion prevention and sediment controls proposed are presented below.

- The location of the individual erosion prevention/sediment control measures will be identified by the Resident Engineer and Contractor. The Contractor will place erosion control devices as identified in the site-specific BMP Plan prior to beginning work.
- Mulch will be placed, during grade and drain activities, across all areas where no work will be conducted for a period of 14 consecutive days.
- Tree clearing within the riparian zone will be minimized. Trees to be removed will be determined by the resident engineer and the contractor prior to disturbance. (Note: Any “Special Note for Tree Clearing Restrictions” must be adhered to.)
- Silt fence, or other approved method as appropriate, will be installed at the edge of waters within the project corridors to eliminate the deposition of rock and debris in the streams during construction activities. In the unforeseen event that unintended debris does enter the streams, the resident engineer will halt the contributing activity until appropriate remedial actions have been implemented.
- To the maximum extent plausible, construction activities will take place during low-flow periods.
- Equipment staging and cleaning areas will be located to eliminate direct inputs to waters of the Commonwealth. These areas will be located such that effluent will be filtered through vegetated areas and appropriate sediment controls prior to discharge offsite.

- Concrete will be poured in a manner to avoid spills into the streams. In the unforeseen event that a spill does occur, the USFWS will be notified, and the resident engineer will immediately halt the activity until remedial measures have been implemented.
- KYTC proposes to stabilize areas disturbed during construction activities through vegetation establishment and placement of riprap and geotextile fabric. Re-vegetation of the disturbed areas will allow thermoregulation of water within the streams, establish long-term, regenerative stabilization of the stream banks, and provide nutrients to the aquatic macroinvertebrate community through inputs of organic material.
- Areas disturbed during construction and not stabilized with rip rap and erosion blanket will be seeded using a standard seed mix. Depending on project slope and project location, application rates and seed mix types will vary. The Contractor shall perform all final seeding and protection, in accordance with the plans and Section 212 of KYTC Standard Specifications.
- Contrary to Section 213.03.03, paragraph 2, the Engineer shall conduct inspections as needed to verify compliance with Section 221 of KYTC Standard Specifications. The Engineer's inspections shall be performed a minimum of once per month and within seven (7) days after a storm of ½ inch or greater. Copies of the Engineer's inspections shall not be provided to the Contractor unless improvements to the BMPs are required. The Contractor shall initiate corrective action within 24 hours of any reported deficiency and complete the work within five (5) days. The Engineer shall use Form TC 63-61 A for this report. Inspections performed by the Engineer do not relieve the Contractor of any responsibility for compliance. If corrections are not made within the five (5) days specified, the liquidated damages will apply at the rate specified in the Liquidated Damages note in the contract.
- Contrary to Sections 212.05 and 213.05, unless listed in the proposal, bid items for temporary BMPs and items for permanent erosion control will not be measured for payment and will be replaced with one lump sum item for the services. Payment will be pro-rated based on the Project Schedule as submitted by the Contractor and as agreed to by the Engineer.
- The Contractor shall be responsible for applying "good engineering practices." The Contractor may use any temporary BMPs and permanent BMPs that fall within the guidance of the current Standard Specifications, KYTC's Best Management Practices manual, and with the approval of the KYTC Engineer.

FOR IMPACT GREATER THAN 1.0 ACRE

When the total disturbed area for a project, including laydown and waste/borrow areas, is greater than 1.0 acre, the Contractor shall be responsible for filing the Kentucky Pollution discharge Elimination System (KPDES) KYR10 permit Notice of Intent (NOI) with the Kentucky Division of Water (DOW). The Contractor will be responsible for following the KPDES requirements of local Municipal Separate Storm Sewer System (MS4) programs with jurisdiction. Required NOI shall name the Contractor as the Facility Operator and include the KYTC Contract ID Number (CID) for reference. For grouped contracts with more than one structure, each structure will be treated independently in regards to disturbed area unless another structure is within 0.25 mile of

the structure. For structures within 0.25 mile of each other, the total disturbed area will be the sum of the combined disturbed areas. The Contractor shall be responsible for filing the KPDES permit Notice of Termination (NOT) with the Kentucky DOW and any local MS4 Program that has jurisdiction. The NOT shall be filed after the Engineer agrees the project is stabilized or the project has been formally accepted.

The Contractor shall perform all temporary erosion/sediment control functions including: providing a Best Management Practice (BMP) Plan, conducting required inspections, modifying the BMP Plan documents as construction progresses, and documenting the installation and maintenance of BMPs in conformance with the KPDES KYR10 permit effective on August 1, 2009, or a permit re-issued to replace that KYR10 permit. This work shall be conducted in conformance with the requirements of Section 213 of the KYTC current Department of Highways, Standard Specifications for Road and Bridge Construction (Standard Specifications).

The Contractor shall be responsible for the examination of the soils to be encountered and make his own independent determination of the temporary BMPs that will be required to accomplish effective erosion prevention and sediment control. The Contractor shall provide the Engineer copies of all documents required by the KPDES permit at the time they are prepared.

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

SPECIAL NOTE

For Additional Environmental Commitments

IN ADDITION TO OTHER ENVIRONMENTAL COMMITMENTS LISTED IN THIS CONTRACT, THE FOLLOWING COMMITMENTS ALSO APPLY, AS THIS IS A FEDERALLY FUNDED UNDERTAKING AS DEFINED IN SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT, [36 CFR 800.16\(Z\)](#):

- 1) The KYTC has completed a Phase 1 archaeological survey for a site-specific area surrounding the bridge. The cleared area is shown as “Archaeologically Cleared Area” or “Environmentally Cleared Area” on the concept plans and/or the map attached to this note or included elsewhere in the proposal. Likewise, any areas that must be avoided have been labeled “Do Not Disturb.” The contractor shall install snow fencing to clearly delineate the boundary of the allowable work/staging area. This work/staging area is restricted to the following: the Archaeologically/Environmentally Cleared Area (noted previously); the right-of-way and easements wherein all activities, equipment, materials, etc. must be contained; and any additional, privately owned land obtained for temporary use by the Contractor through written agreement with the landowner.

If the Contractor deems it necessary to use additional areas outside the Archaeologically/Environmentally Cleared Area for any purposes—e.g., laydown yards, vehicle parking, parking cranes, delivering beams, borrow areas, waste areas, etc.—the Contractor must first get a written agreement with the landowner (assuming the additional area is outside the right-of-way). Then the Contractor shall seek approval of the use of the site—whether within or outside the right-of-way—by both the KYTC Section Supervisor and the Bridging Kentucky Environmental Lead at BKY_Env@docs.e-builder.net. The Contractor shall provide a map of the area(s) to be used, including access points, and property-owner agreements. The BKY Environmental Team will complete initial field investigations for archaeological, historical, ecological, and other environmental clearances. If any potentially significant site or resources are found, the KYTC has the right to deny the use of the proposed site. The maps and property owner agreements are to be submitted at least ten (10) business days prior to the Preconstruction Conference, or sixty (60) days prior to the Contractors access to the site, for coordination and review by the KYTC District and Bridging Kentucky Team.

A Liquidated Damage of \$50,000 will be assessed whenever the Contractor has used any restricted areas. The fee will be assessed on a *per bridge* basis, whether the contract involves bridge bundles or a single bridge. In addition, all fines, fees, penalties, remediation costs, and other damages related to breaches of Threatened and Endangered Species Act Section 7, National Historic Preservation Act Section 106, Clean Water Act Sections 401 and 404, Kentucky General Permit for Stormwater Discharges KYR10, Environmental Protection Agency requirements, State Historic Preservation Office requirements, and other related permitting agencies will be paid by the Contractor, including all associated costs and burdens placed upon the Kentucky Transportation Cabinet.

- 2) In the event that human remains are encountered during project activities, all work should be immediately stopped in the area. The area should be cordoned off, and, in accordance with KRS 72.020, the county coroner and local law enforcement must be contacted immediately. Upon confirmation that the human remains are not of forensic interest, the unanticipated discovery must be reported to Nicolas Laracuenta at the Kentucky Heritage Council at (502) 892-3614, George Crothers at the Office of State Archaeology at (859) 257-1944, and KYTC DEA archaeologists at (502) 564-7250.

For guidance regarding inadvertent discovery and treatment of human remains, refer to the KYTC's [*Right of Way Guidance Manual*](#) (Section ROW-1202), and the Advisory Council on Historic Preservation's (ACHP) [*Policy Statement Regarding Treatment of Human Remains and Grave Goods*](#) (adopted by ACHP February 23, 2007).

- 3) If, during the implementation of The Project, a previously unidentified historic/ archaeological property is discovered or a previously identified historic/archaeological property is affected in an unanticipated manner, the contractor shall (1) call KYTC DEA archaeologists at (502) 564-7250, (2) call SHPO archaeologists at (502) 892-3614, and (3) ensure that all work within a reasonable area of the discovery shall cease until such time as a treatment plan can be developed and implemented.



KyTC BMP Plan for Project CID ## - #####



Kentucky Transportation Cabinet

Highway District 10

And

_____ **(2), Construction**

Kentucky Pollutant Discharge Elimination System

Permit KYR10

Best Management Practices (BMP) plan

Groundwater protection plan

For Highway Construction Activities

For

Replacement

Project: CID ## - #####

KyTC BMP Plan for Project CID ## -

Project Information

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

1. Owner – County Highway Agency, District 10 (1)

2. Resident Engineer: (2)

3. Contractor Name: (2)

Address: (2)

Phone number: (2)

Contact: (2)

Contractor's agent responsible for compliance with KPDES permit requirements: (3)

4. Project Control Number: (2)

5. Route (Address): Kenmont Road over North Fork Kentucky River (1)

6. Latitude/Longitude (project mid-point): 37°12'23.3"N 83°07'54.2"W (1)

7. County (project mid-point): Perry County (1)

8. Project start date (date work will begin): (2)

9. Projected completion date: (2)

KyTC BMP Plan for Project CID ## -

A. Site Description

1. **Nature of Construction Activity (from letting project description):** Address deficiencies of Kenmont Road Bridge (097C00004N) over North Fork Kentucky River, MP 0.09. Replacement SYP No.10-1113. (1)
2. **Order of major soil disturbing activities:** (2) and (3)
3. **Projected volume of material to be moved:** (3)
4. **Estimate of total project area (acres):** (3)
5. **Estimate of area to be disturbed (acres):** (3)
6. **Post construction runoff coefficient** will be included in the project drainage folder. Persons needing information pertaining to the runoff coefficient will contact the resident engineer to request this information. (1)
7. **Data describing existing soil condition:** Soils mapped in the APE consist of an Udorthents-Urban land-Grigsby complex. Urban land refers to areas where the land surface has been covered with interstate, state and county highways, major roads, and other forms of impervious surfaces. Udorthents refers to a deep and very deep mixture of geologic and artificial materials that have been graded to build highways and major roads. The Grigsby series is described as a brown loam extending over a dark yellowish-brown loam extending to 37 inches below ground surface (Soil Survey Staff 2019). (1) and (2)
8. **Data describing existing discharge water quality (if any):** (2)
9. **Receiving water name:** North Fork Kentucky River (1)
10. **TMDLs and Pollutants of Concern in Receiving Waters:** (1 DEA)
11. **Site map:** Project layout sheet plus the erosion control sheets in the project plans that depict Disturbed Drainage Areas (DDAs) and related information. These sheets depict the existing project conditions with areas delineated by DDA (drainage area bounded by watershed breaks and right of way limits), the storm water discharge locations (either as a point discharge or as overland flow) and the areas that drain to each discharge point. These plans define the limits of areas to be disturbed and the location of control measures. Controls will be either site specific as designated by the designer or will be annotated by the contractor and resident engineer before disturbance commences. The project layout sheet shows the surface waters and wetlands.
12. **Potential sources of pollutants:** The primary source of pollutants is solids that are mobilized during storm events. Other sources of pollutants include

KyTC BMP Plan for Project CID ## -

oil/fuel/grease from servicing and operating construction equipment, concrete washout water, sanitary wastes, and trash/debris. (3)

B. Sediment and Erosion Control Measures

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

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

2. Following award of the contract, the contractor and resident engineer will annotate the erosion control sheets showing location and type of BMPs for each of the DDAs that will be disturbed at the outset of the project. This annotation will be accompanied by an order of work that reflects the order or sequence of major soil moving activities. The remaining DDAs are to be designated as "Do Not Disturb" until the contractor and resident engineer prepare the plan for BMPs to be employed. The initial BMP's shall be for the first phase (generally Clearing and Grubbing) and shall be modified as needed as the project changes phases. The BMP Plan will be modified to reflect disturbance in additional DDA's as the work progresses. All DDA's will have adequate BMP's in place before being disturbed.
3. As DDAs are prepared for construction, the following will be addressed for the project as a whole or for each DDA as appropriate:
 - **Construction Access**—This is the first land-disturbing activity. As soon as construction begins, bare areas will be stabilized with gravel and temporary mulch and/or vegetation.
 - **Sources**—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.

KyTC BMP Plan for Project CID ## -

- 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 and 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.
 - 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. Probable 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

KyTC BMP Plan for Project CID ## -

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: (3)

C. Other Control Measures

1. Solid Materials

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 Section Engineer if there any hazardous wastes being generated at the project site and how these wastes are being managed. Site personnel will be instructed regarding 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.
(3)

KyTC BMP Plan for Project CID ## -

➤ **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 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 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.

5. Product-specific Practices

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

KyTC BMP Plan for Project CID ## -

onsite will be stored in tightly sealed containers, which are clearly labeled and will be protected from exposure to weather.

- The contractor shall prepare an Oil Pollution Spill Prevention Control and Countermeasure plan when the project that involves the storage of petroleum products in 55 gallon or larger containers with a total combined storage capacity of 1,320 gallons. This is a requirement of 40 CFR 112.
- This project (will / will not) (3) have over 1,320 gallons of petroleum products with a total capacity, sum of all containers 55-gallon capacity and larger.

➤ **Fertilizers**

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

➤ **Paints**

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

➤ **Concrete Truck Washout**

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

➤ **Spill Control Practices**

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

- Manufacturers' recommended methods for spill cleanup will be clearly posted. All personnel will be made aware of procedures and the location of the information and cleanup supplies.

KyTC BMP Plan for Project CID ## -

- Materials and equipment necessary for spill cleanup will be kept in the material storage area. Equipment and materials will include as appropriate, brooms, dust pans, mops, rags, gloves, oil absorbents, sand, sawdust, and plastic and metal trash containers.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- Spills of toxic or hazardous material will be reported to the appropriate state/local agency as required by KRS 224 and applicable federal law.
- The spill prevention plan will be adjusted as needed to prevent spills from reoccurring and improve spill response and cleanup.
- Spills of products will be cleaned up promptly. Wastes from spill clean-up will be disposed in accordance with appropriate regulations.

D. Other State and Local Plans

This BMP plan shall include any requirements specified in sediment and erosion control plans, storm water management plans or permits that have been approved by other state or local officials. Upon submittal of the NOI, other requirements for surface water protection are incorporated by reference into and are enforceable under this permit (even if they are not specifically included in this BMP plan). This provision does not apply to master or comprehensive plans, non-enforceable guidelines or technical guidance documents that are not identified in a specific plan or permit issued for the construction site by state or local officials. (1)

E. Maintenance

1. The BMP plan shall include a clear description of the maintenance procedures necessary to keep the control measures in good and effective operating condition.
2. 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.
3. 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. (1)

KyTC BMP Plan for Project CID ## -

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 successfully completed KEPSC-RI course as required by Section 213.02.02 of the Standard Specifications for Road and Bridge Construction, current edition.
- Inspection reports will be written, signed, dated, and kept on file.
- Areas at final grade will be seeded and mulched within 14 days.
- Areas that are not at final grade where construction has ceased for a period of 21 days or longer and soil stockpiles 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 50 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.

KyTC BMP Plan for Project CID ## -

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 rainwater (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, require the preparation and implementation of a groundwater protection plan, and will or may be conducted as part of this construction project:

_____2. (e) Land treatment or land disposal of a pollutant.

_____2. (f) Storing...or related handling of hazardous waste, solid waste or special waste...in tanks, drums, or other containers, or in piles (does not include wastes managed in a container placed for collection and removal of municipal solid waste for disposal off site).

_____2. (g) ...handling of materials in bulk quantities (equal or greater than 55 gallons or 100 pounds net dry weight transported held in an individual container) that, if released to the environment, would be a pollutant.

_____2. (j) Storing or related handling of road oils, dust suppressants at a central location.

_____2. (k) Application or related handling of road oils, dust suppressants or deicing materials (does not include use of chloride-based deicing materials applied to roads or parking lots).

KyTC BMP Plan for Project CID ## - ####

____2. (m) Installation, construction, operation, or abandonment of wells, bore holes, or core holes (does not include bore holes for the purpose of explosive demolition).

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

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

The contractor is responsible for the preparation of a plan that addresses the 401 KAR 5:037 Section 3. (3) Elements of site-specific groundwater protection plan:

- (a) General information about this project is covered in the Project information.
- (b) Activities that require a groundwater protection plan have been identified above.
- (c) Practices that will protect groundwater from pollution are addressed in *Section C: Other Control Measures*.
- (d) Implementation schedule—all practices required to prevent pollution of groundwater are to be in place prior to conducting the activity.
- (e) Training is required as a part of the ground water protection plan. All employees of the contractor, sub-contractor, and resident engineer personnel will be trained to understand the nature and requirements of this plan as they pertain to their job function(s). Training will be accomplished within one week of employment and annually thereafter. A record of training will be maintained by the contractor with a copy provided 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 CID ## - ####

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 _____	_____	_____
Typed or printed name ²	Title	Signature

(3) Signed _____	_____	_____
Typed or printed name ¹	Title	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.

KyTC BMP Plan for Project CID ## - ####

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:

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 _____	_____	_____
Typed or printed name ¹	Title	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

FOR EROSION PREVENTION AND SEDIMENT CONTROL

FOR IMPACT REGARDLESS OF SIZE OF THE DISTURBED AREA

Potential impacts to gray bat foraging habitat and habitat for federally listed fish and mussel species will be minimized by implementing erosion prevention and sediment control measures.

As required under Section 213 of the KYTC Standard Specifications, prior to onsite activities a **site-specific Erosion Control Plan including BMPs** to ensure continuous erosion control throughout the construction and post construction period. The plan will identify individual Disturbed Drainage Areas (DDA) where storm water from the construction area will be discharged off site or into waters of the Commonwealth.

Should the Contractor fail to create a BMP Plan or provide and maintain the necessary erosion control, Liquidated Damages will apply at the rate specified in the contract. If no rate is specified, Liquidated Damages will be applied at the rate specified in Section 108 of the Standard Specifications.

The erosion prevention and sediment controls proposed are presented below.

- The location of the individual erosion prevention/sediment control measures will be identified by the Resident Engineer and Contractor. The Contractor will place erosion control devices as identified in the site-specific BMP Plan prior to beginning work.
- Mulch will be placed, during grade and drain activities, across all areas where no work will be conducted for a period of 14 consecutive days.
- Tree clearing within the riparian zone will be minimized. Trees to be removed will be determined by the resident engineer and the contractor prior to disturbance. (Note: Any "Special Note for Tree Clearing Restrictions" must be adhered to.)
- Silt fence, or other approved method as appropriate, will be installed at the edge of waters within the project corridors to eliminate the deposition of rock and debris in the streams during construction activities. In the unforeseen event that unintended debris does enter the streams, the resident engineer will halt the contributing activity until appropriate remedial actions have been implemented.
- To the maximum extent plausible, construction activities will take place during low-flow periods.
- Equipment staging and cleaning areas will be located to eliminate direct inputs to waters of the Commonwealth. These areas will be located such that effluent will be filtered through vegetated areas and appropriate sediment controls prior to discharge offsite.

- Concrete will be poured in a manner to avoid spills into the streams. In the unforeseen event that a spill does occur, the USFWS will be notified, and the resident engineer will immediately halt the activity until remedial measures have been implemented.
- KYTC proposes to stabilize areas disturbed during construction activities through vegetation establishment and placement of riprap and geotextile fabric. Re-vegetation of the disturbed areas will allow thermoregulation of water within the streams, establish long-term, regenerative stabilization of the stream banks, and provide nutrients to the aquatic macroinvertebrate community through inputs of organic material.
- Areas disturbed during construction and not stabilized with rip rap and erosion blanket will be seeded using a standard seed mix. Depending on project slope and project location, application rates and seed mix types will vary. The Contractor shall perform all final seeding and protection, in accordance with the plans and Section 212 of KYTC Standard Specifications.
- Contrary to Section 213.03.03, paragraph 2, the Engineer shall conduct inspections as needed to verify compliance with Section 221 of KYTC Standard Specifications. The Engineer's inspections shall be performed a minimum of once per month and within seven (7) days after a storm of ½ inch or greater. Copies of the Engineer's inspections shall not be provided to the Contractor unless improvements to the BMPs are required. The Contractor shall initiate corrective action within 24 hours of any reported deficiency and complete the work within five (5) days. The Engineer shall use Form TC 63-61 A for this report. Inspections performed by the Engineer do not relieve the Contractor of any responsibility for compliance. If corrections are not made within the five (5) days specified, the liquidated damages will apply at the rate specified in the Liquidated Damages note in the contract.
- Contrary to Sections 212.05 and 213.05, unless listed in the proposal, bid items for temporary BMPs and items for permanent erosion control will not be measured for payment and will be replaced with one lump sum item for the services. Payment will be pro-rated based on the Project Schedule as submitted by the Contractor and as agreed to by the Engineer.
- The Contractor shall be responsible for applying "good engineering practices." The Contractor may use any temporary BMPs and permanent BMPs that fall within the guidance of the current Standard Specifications, KYTC's Best Management Practices manual, and with the approval of the KYTC Engineer.

FOR IMPACT GREATER THAN 1.0 ACRE

When the total disturbed area for a project, including laydown and waste/borrow areas, is greater than 1.0 acre, the Contractor shall be responsible for filing the Kentucky Pollution discharge Elimination System (KPDES) KYR10 permit Notice of Intent (NOI) with the Kentucky Division of Water (DOW). The Contractor will be responsible for following the KPDES requirements of local Municipal Separate Storm Sewer System (MS4) programs with jurisdiction. Required NOI shall name the Contractor as the Facility Operator and include the KYTC Contract ID Number (CID) for reference. For grouped contracts with more than one structure, each structure will be treated independently in regards to disturbed area unless another structure is within 0.25 mile of

the structure. For structures within 0.25 mile of each other, the total disturbed area will be the sum of the combined disturbed areas. The Contractor shall be responsible for filing the KPDES permit Notice of Termination (NOT) with the Kentucky DOW and any local MS4 Program that has jurisdiction. The NOT shall be filed after the Engineer agrees the project is stabilized or the project has been formally accepted.

The Contractor shall perform all temporary erosion/sediment control functions including: providing a Best Management Practice (BMP) Plan, conducting required inspections, modifying the BMP Plan documents as construction progresses, and documenting the installation and maintenance of BMPs in conformance with the KPDES KYR10 permit effective on August 1, 2009, or a permit re-issued to replace that KYR10 permit. This work shall be conducted in conformance with the requirements of Section 213 of the KYTC current Department of Highways, Standard Specifications for Road and Bridge Construction (Standard Specifications).

The Contractor shall be responsible for the examination of the soils to be encountered and make his own independent determination of the temporary BMPs that will be required to accomplish effective erosion prevention and sediment control. The Contractor shall provide the Engineer copies of all documents required by the KPDES permit at the time they are prepared.

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

SPECIAL NOTE

For Additional Environmental Commitments

IN ADDITION TO OTHER ENVIRONMENTAL COMMITMENTS LISTED IN THIS CONTRACT, THE FOLLOWING COMMITMENTS ALSO APPLY, AS THIS IS A FEDERALLY FUNDED UNDERTAKING AS DEFINED IN SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT, [36 CFR 800.16\(Z\)](#):

- 1) The KYTC has completed a Phase 1 archaeological survey for a site-specific area surrounding the bridge. The cleared area is shown as “Archaeologically Cleared Area” or “Environmentally Cleared Area” on the concept plans and/or the map attached to this note or included elsewhere in the proposal. Likewise, any areas that must be avoided have been labeled “Do Not Disturb.” The contractor shall install snow fencing to clearly delineate the boundary of the allowable work/staging area. This work/staging area is restricted to the following: the Archaeologically/Environmentally Cleared Area (noted previously); the right-of-way and easements wherein all activities, equipment, materials, etc. must be contained; and any additional, privately owned land obtained for temporary use by the Contractor through written agreement with the landowner.

If the Contractor deems it necessary to use additional areas outside the Archaeologically/Environmentally Cleared Area for any purposes—e.g., laydown yards, vehicle parking, parking cranes, delivering beams, borrow areas, waste areas, etc.—the Contractor must first get a written agreement with the landowner (assuming the additional area is outside the right-of-way). Then the Contractor shall seek approval of the use of the site—whether within or outside the right-of-way—by both the KYTC Section Supervisor and the Bridging Kentucky Environmental Lead at BKY_Env@docs.e-builder.net. The Contractor shall provide a map of the area(s) to be used, including access points, and property-owner agreements. The BKY Environmental Team will complete initial field investigations for archaeological, historical, ecological, and other environmental clearances. If any potentially significant site or resources are found, the KYTC has the right to deny the use of the proposed site. The maps and property owner agreements are to be submitted at least ten (10) business days prior to the Preconstruction Conference, or sixty (60) days prior to the Contractors access to the site, for coordination and review by the KYTC District and Bridging Kentucky Team.

A Liquidated Damage of \$50,000 will be assessed whenever the Contractor has used any restricted areas. The fee will be assessed on a *per bridge* basis, whether the contract involves bridge bundles or a single bridge. In addition, all fines, fees, penalties, remediation costs, and other damages related to breaches of Threatened and Endangered Species Act Section 7, National Historic Preservation Act Section 106, Clean Water Act Sections 401 and 404, Kentucky General Permit for Stormwater Discharges KYR10, Environmental Protection Agency requirements, State Historic Preservation Office requirements, and other related permitting agencies will be paid by the Contractor, including all associated costs and burdens placed upon the Kentucky Transportation Cabinet.

- 2) In the event that human remains are encountered during project activities, all work should be immediately stopped in the area. The area should be cordoned off, and, in accordance with KRS 72.020, the county coroner and local law enforcement must be contacted immediately. Upon confirmation that the human remains are not of forensic interest, the unanticipated discovery must be reported to Nicolas Laracuenta at the Kentucky Heritage Council at (502) 892-3614, George Crothers at the Office of State Archaeology at (859) 257-1944, and KYTC DEA archaeologists at (502) 564-7250.

For guidance regarding inadvertent discovery and treatment of human remains, refer to the KYTC's [Right of Way Guidance Manual](#) (Section ROW-1202), and the Advisory Council on Historic Preservation's (ACHP) [Policy Statement Regarding Treatment of Human Remains and Grave Goods](#) (adopted by ACHP February 23, 2007).

- 3) If, during the implementation of The Project, a previously unidentified historic/ archaeological property is discovered or a previously identified historic/archaeological property is affected in an unanticipated manner, the contractor shall (1) call KYTC DEA archaeologists at (502) 564-7250, (2) call SHPO archaeologists at (502) 892-3614, and (3) ensure that all work within a reasonable area of the discovery shall cease until such time as a treatment plan can be developed and implemented.

SPECIAL NOTE FOR CONTRACT COMPLETION DATE AND LIQUIDATED DAMAGES ON BRIDGE REPAIR CONTRACTS

I. COMPLETION DATE.

Upon Notice to Proceed, the Contractor has the option of selecting the Begin Work date. Once selected, notify the Department in writing of the date selected at least two weeks prior to beginning work and provide a proposed project schedule. All work is to be completed by the specified contract completion date. The Contractor is allotted 90 calendar days once the bridge is closed to complete all work to safely reopen the structure with no lane closures. At a minimum, prior to reopening the bridge to traffic, all strength requirements and curing for materials used shall be completed per Division 600 of the Standard Specifications. Guardrail shall be installed to the satisfaction of the Engineer prior to reopening the bridge to traffic unless prior approval is obtained from the engineer for use of temporary railing.

The Engineer will begin charging calendar days for a structure on the day the Contractor closes the structure to traffic, regardless of holidays or seasonal weather limitations.

II. LIQUIDATED DAMAGES.

Liquidated damages will be assessed to the Contractor in accordance with the Transportation Cabinet, Department of Highway's current Standard Specifications for Road and Bridge Construction, Section 108.09, when either the allotted number of calendar days or the specified completion date is exceeded.

Contrary to the Standard Specifications, liquidated damages will be assessed to the Contractor during the months of December, January, February and March when the contract time has expired on any individual bridge. Contract time will be charged during these months. All construction must be completed in accordance with the weather limitations specified in Section 606 and/or Section 601 as applicable. No extension of Contract time will be granted due to inclement weather or temperature limitations that occur due to starting work on the Contract or a structure late in the construction season.

Any approval of cold weather plans or allowance of construction operations to occur outside Section 606 and/or Section 601 does not alleviate the 90 day maximum bridge closure. In the event the closure lasts longer than 90 calendar days as specified, liquidated damages will apply to all excess days regardless of weather limitations.

SPECIAL NOTE

Seasonal Tree Clearing Restriction

**DUE TO THE RECOVEREY PLAN FOR ENDANGERED BATS, NO TREE
CLEARING IS PERMITTED FROM JUNE 1 THROUGH JULY 31.**

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



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

<input checked="" type="checkbox"/> Original	<input type="checkbox"/> Re-Certification	RIGHT OF WAY CERTIFICATION	
ITEM #	COUNTY	PROJECT # (STATE)	PROJECT # (FEDERAL)
10-1113	Perry	1100 FD04 121 9414002R	
PROJECT DESCRIPTION			
Bridging Kentucky - 097C00005N - Kenmont Road over N. Fork Kentucky River (replacement)			
<input type="checkbox"/> No Additional Right of Way Required			
Construction will be within the limits of the existing right of way. The right of way was acquired in accordance 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.			
<input checked="" type="checkbox"/> 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.			
<input type="checkbox"/> 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			
<input type="checkbox"/> 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	3	EXCEPTION (S) Parcel #	ANTICIPATED DATE OF POSSESSION WITH EXPLANATION
Number of Parcels That Have Been Acquired			
Signed Deed	2		
Condemnation	1		
Signed ROE	1		
Notes/ Comments (Use Additional Sheet if necessary)			
LPA RW Project Manager		Right of Way Supervisor	
Printed Name		Printed Name	Mark Askin, PE
Signature		Signature	Mark Askin
Date		Date	01/26/22
Right of Way Director		FHWA	
Printed Name	Dean M. Loy	Printed Name	
Signature	DM Loy	Signature	
Date		Date	

UTILITIES AND RAIL CERTIFICATION NOTE

Perry County
No federal number available
No state project number available
Mile point: 0.070 TO 0.117
ADDRESS DEFICIENCIES OF BRIDGE OVER NORTH FORK KENTUCKY RIVER ON KENMONT ROAD (CR 1114) 380 FT SE OF KY 7 (097C00005N)
ITEM NUMBER: 10-1113.00

PROJECT NOTES ON UTILITIES

For all projects under 2000 Linear feet which require a normal excavation locate request pursuant to KRS 367.4901-4917, the awarded contractor shall field mark the proposed excavation or construction boundaries of the project (also called white lining) using the procedure set forth in KRS 367.4909(9)(k). For all projects over 2000 linear feet, which are defined as a "Large Project" in KRS 367.4903(18), the awarded contractor shall initially mark the first 2000 linear feet minimally of proposed excavation or construction boundaries of the project to be worked using the procedure set forth in KRS 367.4909(9)(k). This temporary field locating of the project excavation boundary shall take place prior to submitting an excavation location request to the underground utility protection Kentucky Contact Center. For large projects, the awarded contractor shall work with the impacted utilities to determine when additional white lining of the remainder of the project site will take place. This provision shall not alter or relieve the awarded contractor from complying with requirements of KRS 367.4905 to 367.4917 in their entirety.

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 his activities. The contractor will coordinate his activities to minimize and, where possible, avoid conflicts with utility facilities. Due to the nature of the work proposed, it is unlikely to conflict with the existing utilities beyond minor facility adjustments. Where conflicts with utility facilities are unavoidable, the contractor will coordinate any necessary relocation work with the facility owner and Resident Engineer. The Kentucky Transportation Cabinet maintains the right to remove or alter portions of this contract if a utility conflict occurs. The utility facilities as noted in the previous section(s) have been determined using data garnered by varied means and with varying degrees of accuracy: from the facility owners, a result of S.U.E., field inspections, and/or reviews of record drawings. The facilities defined may not be inclusive of all utilities in the project scope and are not Level A quality, unless specified as such. It is the contractor's responsibility to verify all utilities and their respective locations before excavating.

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

UTILITIES AND RAIL CERTIFICATION NOTE

<p>Perry County No federal number available No state project number available Mile point: 0.070 TO 0.117 ADDRESS DEFICIENCIES OF BRIDGE OVER NORTH FORK KENTUCKY RIVER ON KENMONT ROAD (CR 1114) 380 FT SE OF KY 7 (097C00005N) ITEM NUMBER: 10-1113.00</p>

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

Not Applicable

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

American Electric Power – Electric has completed their relocation.

Windstream Corporation – Telephone has completed their relocation.

UTILITIES AND RAIL CERTIFICATION NOTE

Perry County

No federal number available

No state project number available

Mile point: 0.070 TO 0.117

ADDRESS DEFICIENCIES OF BRIDGE OVER NORTH FORK KENTUCKY RIVER ON KENMONT ROAD (CR 1114) 380 FT SE OF KY 7 (097C00005N)

ITEM NUMBER: 10-1113.00

TVS – CATV- Will be complete with their relocation by April 15, 2022.

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

Not Applicable

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

Perry County Water and Sewer – Water have included their relocation plans as part of this project.

RAIL COMPANIES HAVE FACILITIES IN CONJUNCTION WITH THIS PROJECT AS NOTED

☒ No Rail Involvement ☐ Rail Involved ☐ Rail Adjacent

UTILITIES AND RAIL CERTIFICATION NOTE

Perry County
No federal number available
No state project number available
Mile point: 0.070 TO 0.117
ADDRESS DEFICIENCIES OF BRIDGE OVER NORTH FORK KENTUCKY RIVER ON KENMONT ROAD (CR 1114) 380 FT SE OF KY 7 (097C00005N)
ITEM NUMBER: 10-1113.00

AREA FACILITY OWNER CONTACT LIST

Facility Owner	Address	Contact Name	Phone	Email
American Electric Power - Electric	32222 Kevin lane Ashland KY 41701	Ron Canfield	6069291462	rlcanfield@aep.com
Perry County Water and Sewer - Water	PO Box 249 Vicco Ky 41773	Vernon Anderton	6068542181	kittyanderton@yahoo.com
TVS - CATV	P.O. Box 1410 Hindman KY 41822	Freddie Williams	6067859500	f.williams@tgtel.com
Windstream Communications LLC - Telephone	130 W. New Circle Road, Suite 170 Lexington KY 40505	Steve Johnson	8593576209	steve.johnson@windstream.com

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:

PERRY COUNTY WATER DISTRICT

See last page for contractors

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

When the list of approved subcontractors for the utility work is not provided in these general notes, the utility work can be completed by the prime contractor. If the prime contractor chooses to subcontract the work, the subcontractor shall be prequalified with the KYTC Division of Construction Procurement in the work type of "Utilities" (I33). Those who would like to become prequalified may contact the Division of Construction Procurement at (502) 564-3500. Please note: it could take up to 30 calendar days for prequalification to be approved. The prequalification does not have to be approved prior to the bid, but must be approved before the subcontract will be approved by KYTC and the work can be performed.

CONTRACT ADMINISTRATION RELATIVE TO UTILITY WORK

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

SUBMITTALS AND CORRESPONDENCE

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

ENGINEER

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

INSPECTOR OR RESIDENT PROJECT REPRESENTATIVE

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

NOTICE TO UTILITY OWNERS OF THE START OF WORK

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

UTILITY SHUTDOWNS

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

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

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

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

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

STATIONS AND DISTANCES

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

RESTORATION

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

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

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

MATERIAL

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

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

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

SECURITY OF SUPPLIED MATERIALS

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

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

PREQUALIFIED CONTRACTORS

G&W Construction, Inc
Darrell Alderman, President (Cell - (606) 776-3082)
6730 Flemingsburg Road
Morehead, KY 40351
Joan Owens, Office Manager
(606) 784-2396
Email: gandwconst@windstream.net

Akins Excavating Company, Inc.
Tim Akins, President (cell: 606-521-1057)
182 Busy Lane
Corbin, KY 40701
Terry Branson - Office Contact
Email: takins@akinsexc.com
Email: tbranson@akinsexc.com

Standard Water Bid Item Descriptions

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

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

NOTE: A bid code for this item has been established in standard roadway bid items and shall be used for payment of this item. The bid code is 21341ND

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

TECHNICAL SPECIFICATIONS

Kenmont Road Waterline Relocation Project Perry County FD04 097 94140 01U Item No. 10-1113.00

For

Perry County Water and Sewer



RMJE

3376 Hwy 550 E
P.O. Box 444
Hindman, Kentucky 41822

3213 Summit Square Place
Suite 100
Lexington, Kentucky 40509

June 2020

TABLE OF CONTENTS

Technical Specifications:

Division 2

Section 02101.1 - Erosion and Sediment Control	29 pages
Section 02220.1 - Earthwork	06 pages
Section 02610 – Piping and Fittings	44 pages
Section 02613 - Installation of Waterline Accessories	08 pages
Section 02615 – Horizontal Directional Drilling	10 pages
Section 02616 – Tracer Wire Installation	04 pages
Section 02900 – Lawns and Grasses	05 pages

Division 15

Section 15100 – Valves, Meters, Hydrants & Fluid Transport Appurtenances	21 pages
--	----------

**SECTION 020101.1
EROSION AND SEDIMENT CONTROL**

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The Contractor shall furnish all labor, materials, and equipment required for installing, maintaining, amending, and removing temporary soil erosion, sediment, and pollutant controls as specified herein and as required by the Prestonsburg City's Utilities Commission.
- B. The Contractor shall take all site management measures necessary to minimize erosion and contain sediment, construction materials (including excavation and backfill), and pollutants (such as chemicals, fuels, lubricants, bitumen, raw sewage, and other harmful waste) and prevent them from being discharged into or alongside any body of water or into natural or man-made channels leading thereto.
- C. The Contractor shall at all times minimize disturbance and the period of time that the disturbed area is exposed without stabilization practices. In "critical areas" (within 25 feet of a stream) erosion prevention measures such as erosion control mats/blankets, mulch, or straw blown in and stabilized with tackifiers or by treading, etc shall be implemented on disturbed areas within 24 hours or "as soon as practical" after completion of disturbance/grading or following cessation of activities.
- D. Temporary erosion controls include, but are not limited to grassing, mulching, seeding, providing erosion control and turf reinforcement mats on all disturbed surfaces including waste area surfaces and stockpile and borrow area surfaces; scheduling work to minimize erosion and providing interceptor ditches at those locations which will ensure that erosion during construction will be either eliminated or maintained within acceptable limits.
- E. Temporary sedimentation controls include, but are not limited to, silt dams, traps, barriers, and appurtenances on sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits.
- F. Contractor is responsible for providing and maintaining effective temporary erosion and sediment control measures prior to and during construction or until final controls become effective.
- G. The Contractor shall furnish, install and maintain additional mulch, blankets, sediment barriers, and/or other controls as necessary to control pollution, erosion, and sedimentation to the satisfaction of the regulatory agency.
- H. The Contractor shall inspect and repair all erosion and sedimentation controls as follows:
 - 1. At least once every seven (7) calendar days, and
 - 2. Within 24 hours after any storm event of 0.5 inch or greater.
- I. Final stabilization practices on those portions of the project where construction activities have permanently ceased shall be initiated within fourteen (14) days of the date of cessation of construction activities. Temporary stabilization practices on those portions of the project where construction activities have temporarily ceased shall be initiated within fourteen (14) days of the date of cessation of construction activities.
- J. **Erosion and Sediment Control prevention measures shall be installed prior to removal of vegetation and/or stripping of topsoil.** The Contractor is responsible for preparing and submitting the state Notice of Intent and attachments and obtaining state permit approval prior to the beginning of any construction activities.

1.02 PERMITS AND NOTIFICATION REQUIREMENTS

- A. The Contractor shall implement erosion, sediment and pollution control measures as may be required by state, local and federal agencies. Contractor shall submit a signed Notice of Intent form and required attachments to the Division of Water at least seven (7) days prior to beginning of construction activity. **See Article 3.24 in this Section for detailed requirements.**

1.03 RELATED WORK

- A. Section 02373 – Stream Crossings, Streambank Restoration, and Stream Buffer Restoration

PART 2 – PRODUCTS

2.01 MULCH

- A. Mulch shall be used as a soil stabilization measure for any disturbed area inactive for 14 days or longer. Areas requiring stabilization during December through February shall receive only mulch held in place with bituminous material. Mulching shall be used whenever permanent or temporary seeding is used. The anchoring of mulch shall be in accordance with the Construction Drawings except all mulch placed in December through February shall be anchored with bituminous materials regardless of the slope. Permanent mulches shall be used in conjunction with planting trees, shrubs, and other ground covers that do not provide adequate soil stabilization.
- B. Straw shall come from wheat, rye, or barley and may be spread by hand or machine. Straw shall be anchored. Straw shall be applied at two tons per acre or 90 pounds per 1,000 square feet. Straw shall be free from weeds and coarse matter.
- C. Wood chips do not require tacking. Wood chips shall be applied at 270 cubic yards per acre or 6 cubic yard per 1,000 square feet and approximately 2 inches deep. Wood chips shall be treated with 20 pounds of nitrogen per acre or shall be treated with 12 pounds slow-release nitrogen per ton to prevent nutrient deficiency in plants.
- D. Bark chips or shredded bark shall be applied at 70 cubic yards per acre or 1.5 to 2 cubic yards per 1,000 square feet and about one-half inch thick. Bark does not require additional nitrogen fertilizer.
- E. Manufacturer's recommendations shall be followed during application of manufactured wood fiber and recycled paper sold as mulch materials applied in a hydroseeder slurry with binders/tackifiers. Recycled paper (newsprint) or wood fiber shall be mixed at 50 pounds per 100 gallons of water and applied according to manufacturer's recommendations and model of hydroseeder in use.
- F. Liquid mulch binders/tackifiers shall be applied according to manufacturer's recommendations. Chemical soil stabilizers or soil binders/tackifiers/emulsions shall not be used alone.
- G. Netting and mats shall be used in critical areas such as waterways where concentrated flows are expected.

- H. Before the gravel or crushed stone is applied, it shall be washed. Aggregate cover shall only be used in relatively small areas and shall be incorporated into an overall landscaping plan.

2.02 TEMPORARY SEED

- A. Temporary seeding shall be used for soil stabilization when grades are not ready for permanent seeding, except during December through February. The seed shall be applied within 14 days after grading has stopped. Only rye grain or annual rye grass seed shall be used for temporary seeding.

2.03 PERMANENT SEED

- A. Permanent seeding shall be applied within 14 days after final grade has been reached, except during December through February. Permanent seeding shall also be applied on any areas that will not be disturbed again for a year even if final grades have not been reached. The use of mulch and erosion matting and netting with permanent seeding shall be in accordance with applicable sections of this Specification. "Seed mats" may be used for permanent seeding in accordance with manufacturers' recommendations.
- B. Permanent seeding shall be used on disturbed areas where permanent, long-lived vegetative cover is needed to stabilize the soil and on rough graded areas that will not be brought to final grade for one year or more.
- C. The area to be seeded shall be protected from excess runoff as necessary with diversions, grassed waterways, terraces, or sediment ponds.
- D. Contractor shall use the following Permanent Seed Mix, with the following exceptions:
- a. If a property owner landscaping agreement differs from this specification, the property owner landscaping agreement shall be followed on that property, or
 - b. The area to be seeded is within 25 feet of a stream bank, in which case Contractor shall follow the seed mix provided in Section 02373, or
 - c. The Construction Drawings identify a different seed mix.

The Permanent Seed Mix shall consist of the following mix spread at a rate of 12.5 pounds/1,000 square feet:

Common Name	%	lbs per 1,000 sq. ft.
Bluegrass	24%	3
Perennial ryegrass (turf)	16%	2
+ bluegrass	20%	2.5
Tall fescue (turf type)	32%	4
+ bluegrass	8%	1
TOTAL	100%	12.5

- E. Vegetative cover alone shall not be used to provide erosion control cover and prevent soil slippage on a soil that is not stable due to its structure, water movement, or excessive slope.
- F. Permanent seeding may be done at any time except December through February.
- G. Soil material shall be capable of supporting permanent vegetation and have at least 25 percent silt and clay to provide an adequate amount of moisture holding capacity. An

excessive amount of sand will not consistently provide sufficient moisture for good growth regardless of other soil factors.

- H. Fertilizer shall be applied at a rate of 800 pounds per acre of 10-10-10 analysis or equivalent, unless soil test results indicate a different rate is appropriate. Lime shall be applied at a rate of 100 pounds per 1,000 square feet or two tons per acre of agricultural ground limestone, unless soil test results indicate differently.

2.04 SOD

- A. Sod shall be used for disturbed areas that require immediate vegetative cover, e.g., the area surrounding a drop inlet in a grassed waterway, the design flow perimeter of a grassed waterway that will convey flow before vegetation can be established, and the inlet of a culvert. Sod may be installed throughout the year. "Seed mats" and seed with geotextiles may be used in place of sod when done in accordance with manufacturers' recommendations.
- B. Contractor shall use tall fescue sod, unless another species is specified in the Construction Drawings or unless the property owner landscaping agreement differs from this specification.
- C. Sod shall not be used to provide erosion control and prevent soil slippage on a soil that is not stable due to its structure, water movement, or excessive slope.
- D. Sod shall be installed within 36 hours of digging and removal from the field. Sod should not be used on slopes steeper than 2H:1V. If it is to be mowed, installation should be on slopes no greater than 3H:1V.
- E. Soil material shall be capable of supporting permanent vegetation and shall consist of at least 25 percent silt and clay to provide an adequate amount of moisture holding capacity. An excessive amount of sand will not consistently provide sufficient moisture for the sod regardless of other soil factors.
- F. Fertilizer shall be applied at a rate of 1,000 pounds per acre of 10-10-10 analysis or equivalent, unless soil test results indicate a different rate is appropriate. Lime shall be applied at a rate of 100 pounds per 1,000 square feet or two tons per acre of agricultural ground limestone, unless soil test results indicate differently.
- G. The sod shall consist of strips of live, vigorously growing grasses. The sod shall be free of noxious and secondary noxious weeds and shall be obtained from good, solid, thick-growing stands. The sod shall be cut and transferred to the job in the largest continuous pieces that will hold together and are practical to handle.
- H. The sod shall be cut with smooth clean edges and square ends to facilitate laying and fitting. The sod shall be cut to a uniform thickness of not less than three-fourth inch measured from the crown of the plants to the bottom of the sod strips for all grasses except bluegrass. Bluegrass sod shall be cut to a uniform thickness of not less than one and one-half inches.
- I. The sod shall be mowed to a height of not less than two inches and no more than four inches prior to cutting.
- J. The sod shall be kept moist and covered during hauling and preparation for placement on the sod bed.

2.05 ROAD/PARKING STABILIZATION

- A. Gravel or paved material shall be used to stabilize permanent roads or parking areas or roads or parking areas used repeatedly by construction traffic. Stabilization shall be

accomplished within 14 days of grading or initiation of use for construction traffic. Unstabilized roads are not acceptable except in instances where the road will be used less than one month.

- B. Road/parking stabilization shall be used wherever roads or parking areas are constructed, whether permanent or temporary, for use by construction traffic.
- C. Stabilization shall be accomplished with a minimum depth of six inches of crushed stone. Stabilized construction roadbeds shall be at least 14 feet wide for one-way traffic and at least 20 feet wide for two-way traffic.
- D. Temporary roads shall follow the contour of the natural terrain to the extent possible. Slopes shall not exceed 10 percent.
- E. Temporary parking areas shall be located on naturally flat areas to minimize grading. Grades shall be sufficient to provide drainage but shall not exceed 4 percent.
- F. All cuts and fills shall be 2H:1V or flatter.
- G. Drainage ditches shall be provided as needed.
- H. Crushed stone shall be KYTC aggregate No. 2 (1.5 to 3 inches in diameter), or equivalent.

2.06 CONSTRUCTION ENTRANCE

- A. A stabilized construction entrance shall be constructed wherever vehicles are leaving a construction site to enter a public road or at any unpaved entrance/exit location where there is a risk of transporting mud or sediment onto paved roads. A construction entrance shall be constructed at the beginning of the project before construction traffic begins to enter and exit the site.
- B. A stabilized construction entrance shall be constructed of crushed stone a minimum of 6 inches thick laid over geotextile (filter fabric).
- C. The width shall be at least 20 feet and as wide as the entire width of the access. At sites where traffic volume is high, the entrance shall be wide enough for two vehicles to pass safely. The length shall be at least 50 feet, and where practical, shall be extended to 100 feet. The entrance shall be flared where it meets the existing road to provide a turning radius.
- D. Stormwater and wash water runoff from a stabilized construction entrance shall drain to a sediment trap or sediment pond. If conditions on the site are such that the majority of the mud is not removed by the vehicles traveling over the gravel, then the tires of the vehicles shall be washed before entering a public road.
- E. Pipe placed under the entrance to handle runoff shall be protected with a mountable berm.
- F. Dust control shall be provided in accordance with the applicable sections of this Specification.
- G. Crushed stone shall be KYTC aggregate No. 2 (1.5 to 3 inches in diameter), or equivalent.
- H. Geotextile filter fabric shall be KYTC Type III.

2.07 DUST CONTROL

- A. Dust control measures shall be implemented on the site.

- B. Construction activities shall be phased to minimize the total area unstabilized at any given time, thereby reducing erosion due to air and water movement.
- C. Construction roads shall be watered as needed to minimize dust.
- D. Existing trees, shrubs, and ground cover shall be retained as long as possible during the construction. Initial land clearing should be conducted only in those areas to be regraded or where construction is to occur. Areas to be cleared only for new vegetation or landscaping shall be stabilized with seed and mulch immediately following clearing.
- E. Vegetative cover is the most effective means of dust and erosion control, when appropriate. See sections on Temporary Seed, Permanent Seed, Mulch, and Sod of this Specification.
- F. When areas have been regraded and brought to final grade, they shall be stabilized using temporary or permanent seed and mulch or other measures.
- G. Mulch with mulch binders may be used as an interim dust control measure in areas where vegetation may not be appropriate.
- H. See sections on Temporary Seed, Permanent Seed, Sod, Mulch, Road/Parking Stabilization, and Construction Entrance of this Specification.

2.08 NETS AND MATS

- A. Mulch netting, erosion control matting, or turf reinforcement matting (TRM) shall be used on sloping areas as indicated in the Construction Drawings. Mats or nets and permanent seeding may be used as an alternate to sod for culvert entrances and grassed waterways. TRMs shall be used at the water line to control wave action in wet ponds. TRMs shall be used in accordance with manufacturer's recommendations. Erosion control matting may be used to stabilize channels and swales and on recently planted slopes to protect seedlings until they become established.
- B. Effective netting and matting shall require firm, continuous contact between the materials and the soil. If there is no contact, the material will not hold the soil and erosion will occur underneath the material.
- C. Nets and mats shall be suitable for their intended purpose and shall be as indicated in the Construction Drawings.

2.09 TEMPORARY DIVERSION DITCH

- A. Temporary diversion ditches shall be used to collect sediment-laden runoff from disturbed areas and direct it to a sediment pond where applicable. Temporary ditches are those expected to be in use for less than one year. Temporary diversion ditches do not require stabilization, unless otherwise indicated on the Construction Drawings.
- B. Temporary diversion ditches shall have stable outlets. The combination of conditions of site, slopes, and soils should be so that the ditch can be maintained throughout its planned life.
- C. Temporary diversion ditches shall not be constructed below high sediment-producing areas unless land treatment practices or structural measures, designed to prevent damaging accumulations of sediment in the channels, are installed with or before the diversion.
- D. A typical diversion cross section consists of a channel and a supporting ridge. In the case of an excavated-type diversion, the natural ground serves as the diversion ridge. Diversion cross sections shall be adapted to the equipment that will be used for their construction and maintenance.

- E. The channel may be parabolic or trapezoidal in shape. V-shaped ditches shall not be constructed.
- F. Diversions shall be located so that water will empty onto an established area such as a stable watercourse, waterway, or structure.
- G. Any high sediment-producing area above a diversion shall be controlled by good land use management or by structural measures to prevent excessive sediment accumulation in the diversion channel.
- H. Temporary diversions above steep slopes or across graded rights-of-way shall have a berm with a minimum top width of 2 feet, side slopes of 2:1 or flatter and a minimum height of 18 inches measured from the channel bottom.
- I. Diversions installed to intercept flow on graded rights-of-way shall be spaced 200 to 300 feet apart.
- J. A level lip spreader shall be used at diversion outlets discharging onto areas already stabilized by vegetation.

2.10 LEVEL SPREADER

- A. Level spreaders shall be constructed at the outlets of temporary diversion ditches. Level spreaders shall also be constructed at outlets of permanent constructed waterways where they terminate on undisturbed areas.
- B. The length of the level spreader shall be constructed as shown on the Construction Drawings.

2.11 PERMANENT CONSTRUCTED WATERWAY

- A. Permanent constructed waterways shall be used to divert stormwater runoff from upland undisturbed areas around or away from areas to be disturbed during construction. A waterway expected to be in place for at least one year shall be considered permanent. Permanent waterways shall be lined with sod or permanent seeding and nets, mats, or TRMs.

2.12 PIPE SLOPE DRAIN

- A. Pipe slope drains shall be used whenever it is necessary to convey water down a steep slope, which is not stabilized or which is prone to erosion, unless paved ditch (flume) is installed.
- B. Contractor shall use a 10-inch diameter pipe or larger to convey runoff from areas up to one-third acre; 12-inch or larger pipe for up to half-acre drainage areas; and 18-inch pipe for areas up to one acre, unless otherwise specified in the Construction Drawings. Multiple pipes shall be required for large areas, spaced as shown on the Construction Drawings.
- C. The pipe shall be heavy duty flexible tubing designed for this purpose, e.g., non-perforated, corrugated plastic pipe, or specially designed flexible tubing.
- D. A standard flared end section or a standard T-section fitting secured with a watertight fitting shall be used for the inlet.
- E. Extension collars shall be 12-inch long sections of corrugated pipe. All fittings shall be

watertight.

2.13 IMPACT STILLING BASIN

- A. Impact stilling basins shall be used at the outlet of culverts and storm sewers with calculated exit velocities greater than 15 feet per second when flowing full.

2.14 CHECK DAM

- A. Check dams shall be limited to use in small, open channels that drain 10 acres or less.
- B. Check dams shall not be used in streams.
- C. Check dams can be constructed of stones, coir logs, or wood fiber logs.
- D. Check dams shall be constructed prior to the establishment of vegetation.
- E. The maximum height of a check dam shall be three feet above the ground on which the rock is placed.
- F. The center of the portion of the check dam above the flat portion of the channel shall be at least 1 foot lower than the outer edges. The outer edges of the check dam shall extend up the side slopes of the channel to a point 3 feet in elevation above the center portion of the check dam or to the top of the side slopes.
- G. The maximum spacing between rock check dams in a ditch should be such that the toe of the upstream dam is at the same elevation as the top of the next downstream dam.
- H. The spacing of coir and wood fiber check dams is one log every 100 feet for velocities of 5 fps, 50 feet for velocities between 5 and 7.5 fps, and 25 feet for velocities greater than 10 fps, unless otherwise shown in the Construction Documents.
- I. Stone check dams shall be constructed of KYTC Class II channel lining.
- J. Coir log or wood fiber log check dams shall be constructed of a single log with a diameter of at least 20 inches.

2.15 SEDIMENT TRAP

- A. Sediment traps shall be installed below all disturbed areas of less than 5 acres that do not drain to a sediment pond.
- B. Erosion control practices such as seeding, mulching, sodding, diversion dikes, etc., shall be used in conjunction with sediment traps to reduce the amount of sediment flowing into the trap. The amount of sediment entering a trap can be reduced by the use of stabilized diversion dikes and ditches.
- C. The trap shall not be located in a stream. It shall be located to trap sediment-laden runoff before it enters the stream.
- D. Trap depth shall be at least 2 feet at the inlet and 4 feet at the outlet. Effective trap width shall be at least 10 feet and trap length shall be at least 30 feet.
- E. The Construction Drawings shall indicate the final disposition of the sediment trap after the upstream drainage area is stabilized. The Construction Drawings shall indicate methods for the removal of excess water lying over the sediment, stabilization of the pond site, and the

disposal of any excess material.

2.16 SEDIMENT POND

- A. A sediment pond shall be installed at the outlet of a disturbed area of 5 acres or more. The maximum drainage area for a single pond is 100 acres.
- B. Design and construction shall comply with all federal, state, and local laws, ordinances, rules, and regulations regarding dams.
- C. Erosion control practices such as seeding, mulching, sodding, diversion dikes, etc., shall be used in conjunction with sediment ponds to reduce the amount of sediment flowing into the pond.
- D. The pond shall not be located in a stream. It shall be located to trap sediment-laden runoff before it enters the stream.
- E. Contractor shall construct the sediment pond as shown on the Construction Drawings.
- F. Permanent ponds designed for stormwater detention or water quality treatment may serve as temporary sediment ponds if site conditions make the use of these structures desirable. At the time of conversion from a sediment pond to a permanent stormwater management pond, excess sediment shall be cleaned from the pond. If the pond is converted to a water quality basin, the sand in the sand filter outlet shall be replaced with clean sand unless it is shown to be clean.
- G. The Construction Drawings shall indicate the final disposition of the sediment pond after the upstream drainage area is stabilized. The Construction Drawings shall indicate methods for the removal of excess water lying over the sediment, stabilization of the pond site, and the disposal of any excess material.
- H. Vegetation shall be established upon completion of construction of the embankment, emergency spillway and other areas disturbed by construction.

2.17 SILT FENCE

- A. Silt fence shall be installed down-slope of areas to be disturbed prior to clearing and grading. Silt fence shall be situated such that the total area draining to the fence is not greater than one-fourth acre per 100 feet of fence. Silt fence shall be used for storm drain drop inlet protection and around soil stockpiles.
- B. Under no circumstances shall silt fences be constructed in streams or in swales or ditch lines or any area of concentrated flow where discharge rates are likely to exceed 1 cubic foot per second (cfs).
- C. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, and polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

<u>PHYSICAL PROPERTY</u>	<u>REQUIREMENTS</u>
Filtering Efficiency	80% (minimum)
Tensile Strength at 20%	50 lbs./linear inch (minimum)
Flow Rate	0.3 gal./ sq. ft/ min. (minimum)

- D. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0°F to 120°F.

- E. Posts for synthetic fabric silt fences shall be either 2-inch by 2-inch wood or 1.33 pounds per linear foot steel with a minimum length of 5 feet. Steel posts shall have projections for fastening wire to them.
- F. Wire fence reinforcement for silt fences shall be a minimum of 36 inches in height, a minimum of 14 gauge and shall have a mesh spacing of no greater than 6 inches.

2.18 STORM DRAIN INLET PROTECTION

- A. Storm drain inlet protection may be utilized on drop inlets and curb inlets.
- B. Storm drain inlet protection shall only be used around drop inlets when the up-slope area draining to the inlet has no other or inadequate sediment control.
- C. The drainage area shall be no greater than 1 acre.
- D. The inlet protection device shall be constructed in a manner that will facilitate cleanout and disposal of trapped sediment and minimize interference with construction activities.
- E. Inlet protection devices shall be constructed in such a manner that any resultant ponding of stormwater will not cause flooding or excessive inconvenience or damage to adjacent areas, roadways, properties, or structures.
- F. Inlet protection devices are low flow filter devices, and as such shall be constructed in such a manner as to allow for higher flows to bypass into the storm drain system to prevent flooding of the roadway or downstream properties.

2.19 FILTER STRIP

- A. Filter strips shall be used on each side of permanent constructed channels.
- B. Filter strips shall only be used to remove sediment from overland flow. Filter strips are not effective in removing sediment from concentrated flows.
- C. If vegetative filters are proposed as a sediment control device and they do not already exist, they shall be planted and established prior to initiating land disturbing activities.
- D. The minimum filter strip width shall be 50 feet for streams, wetlands, and sinkholes. The minimum filter strip width shall be ten feet for constructed waterways.
- E. Where a post development floodplain or wet weather conveyance is being protected, filter strips shall be provided on each side. When a wetland or sinkhole is being protected, filter strips shall be provided around the perimeter.
- F. Contractor shall construct the filter strips as shown on the Construction Drawings.
- G. Existing grass or grass/legume mixtures used as filter strips shall be dense and well established, with no bare spots. When establishing new seeding, consideration shall be given to wildlife needs and soil conditions on the site. The following chart provides a list of alternative grass and grass/legume mixtures:

SEEDING MIXTURE AND SITE SUITABILITY CHART

Seeding Mixture	Rate lbs/acre	Soil Suitability
-----------------	------------------	------------------

Alfalfa Or Red Clover Plus Timothy Or Orchardgrass Or Bromegrass	6 10 4 6 6	Well Drained
Ladino Plus Timothy Or Orchardgrass Or Bromegrass	.05 4 6 8	Wet or Well-Drained

- Notes:
- 1. All seeding shall be in accordance with the seeding sections of this Specification.
 - 2. Well drained sites include sites that are drained with tile as well as naturally well drained and droughty sites. Wet sites include sites that are excessively wet only a portion of the growing season.

2.20 STREAM CROSSING

- A. Stream crossings shall be used in cases where construction traffic, permanent traffic, or utilities must cross existing post development floodplains. If the drainage area exceeds 1 square mile and a structure is necessary, the structure must be designed by a professional engineer licensed in Kentucky, and shall be considered a permanent structure.
- B. Temporary stream crossings are applicable to flowing streams with drainage areas less than one square mile. Temporary stream crossings shall be planned to be in service for the shortest practical period of time and to be removed as soon as their function is completed.
- C. All such structures, whether temporary or permanent, are subject to the rules and regulations of the U.S. Army Corps of Engineers for in-stream modifications (404 Permitting) and the Kentucky Division of Water (401 Certification). No stream crossing shall be installed without first obtaining all applicable local, state, and federal permits.

Where culverts are to be installed, compacted soil or rock shall be used to form the crossing. The depth of soil or rock cover over the culvert shall be equal to one-half the diameter of the culvert or 12 inches, whichever is greater. The sides of the fill shall be protected from erosion using the mulching and seeding erosion control measures specified in this Specification.

- D. All stream crossings shall be constructed in such a manner as to avoid flooding or excessive inconvenience or damage to adjacent areas, roadways, properties, or structures.
- E. When using a culvert crossing, the top of a compacted earth fill shall be covered with six inches of KYTC No. 57 stone.
- F. KYTC No. 57 stone shall also be used for the stone pads forming the crossing approaches.

2.21 PUMP AROUND FLOW DIVERSION

- A. A pump-around flow diversion shall be used to divert flow around construction activities occurring in a stream when those activities are reasonably expected to cause the erosion of sediment or deposition of sediment in the stream.
- B. Check dams to form the diversion shall span the banks of the stream. Maintain 1-foot freeboard (minimum) on the upstream and downstream checks.
- C. Check dams may be constructed of sandbags or may be a water-filled bladder such as an Aqua-Barrier.
- D. The dewatering flow from the work area shall be treated in a sediment-trapping device prior to discharge to the stream.
- E. Sandbags shall be woven polypropylene bags with approximate dimensions of 18-1/2 inches by 28 inches. Contractor shall tie the ends of filled bags closed using either draw strings or wire ties.

2.22 CONSTRUCTION DEWATERING

- A. Sediment-laden water shall be pumped to a dewatering structure before it is discharged.

PART 3 – EXECUTION

3.01 GENERAL

- A. Erosion and sediment control practices shall be consistent with the requirements of the state and local regulatory agencies and in any case shall be adequate to prevent erosion of disturbed and/or regraded areas.
- B. Contractor is responsible for notifying the state regulatory agency concerning inclusion under the KPDES General Permit for Storm Water Discharges Associated with Construction Activities.
- C. Gravity sewer lines, force mains and water lines that cross streams shall be constructed by methods that maintain normal stream flow and allow for a dry excavation. Water pumped from the excavation shall be contained and allowed to settle prior to reentering the stream. Excavation equipment and vehicles shall operate outside of the flowing portion of the stream. Spoil material from the line excavation shall not be allowed to enter the flowing portion of the stream. The provisions of this condition shall apply to all types of utility line stream crossings.
- D. Removal of riparian vegetation in the utility line right-of-way shall be limited to that necessary for equipment access. Effective erosion and sedimentation control measures shall be employed at all times during the project to prevent degradation of waters of the Commonwealth. Site regrading and reseeding shall be accomplished with 14 days after disturbance.

3.02 MULCH

- A. Seed shall be applied prior to mulching except where seed is to be applied as part of a hydroseeder slurry containing mulch.
- B. Lime and fertilizer shall be incorporated and surface roughening accomplished as needed prior to mulching in accordance with applicable sections of this Specification.
- C. Mulch materials shall be spread uniformly by hand or mechanically so the soil surface is covered. During or immediately following application, the mulch shall be anchored or otherwise secured to the ground according to one of the following methods:
 - 1. Mechanical – Use a disk, crimper, or similar type tool set straight to punch or anchor the mulch material into the soil.
 - 2. Mulch Tackifiers/Nettings/Emulsions – Use according to the manufacturer's recommendations. This is a superior method in areas of water concentration to hold mulch in place.
 - 3. Wood Fiber – Wood fiber hydroseeder slurries may be used to tack straw mulch. This combination treatment is well suited to steep slopes and critical areas, and severe climate conditions.
- D. Mulch shall be anchored using a mulch anchoring tool, a liquid binder/tackifier, or mulch nettings. Nets and mats shall be installed to obtain firm, continuous contact between the material and the soil. Without such contact, the material is useless and erosion occurs.
- E. A mulch anchoring tool is a tractor-drawn implement that is typically used for anchoring straw and is designed to punch mulch approximately two inches into the soil surface. Machinery shall be operated on the contour and shall not be used on slopes steeper than 3H:1V.

- F. When using liquid mulch binders and tackifiers, application shall be heaviest around edges of areas and at crests of ridges and banks to prevent wind blow. Remainder of area shall have binders/tackifiers spread uniformly in accordance with manufacturer's recommendations.
- G. When using a mulch net, it shall be used in conjunction with an organic mulch and shall be installed immediately after the application and spreading of the mulch. Mulch net shall be installed over the mulch except when the mulch manufacturer recommends otherwise.
- H. Excelsior blankets and mats with mulch are considered protective mulches and may be used alone on erodible soils and during all times of year. Erosion control mats shall be installed in accordance with manufacturer's recommendations.
- I. Mulched areas shall be inspected at least weekly and after each rainfall of one-half inch or more. When mulch material is found to be loosened or removed, the mulch cover shall be replaced within 48 hours.

3.03 TEMPORARY SEED

- A. The site shall be graded as needed to permit the use of conventional equipment for seedbed preparation, seeding, mulch application, and anchoring.
- B. The needed erosion control practices, such as diversions, temporary waterways for diversion outlets, and sediment ponds, shall be installed prior to seeding.
- C. Prior to seeding, lime and fertilizer shall be worked into the soil with a disk harrow, springtooth harrow, or similar tools to a depth of two inches. On sloping areas, the final operation shall be on the contour.
- D. The seed shall be applied uniformly with a cyclone seeder, drill, cultipacker, seeder, or hydroseeder (slurry may include seed and fertilizer) preferably on a firm, moist seedbed. Seed shall be sown no deeper than one-fourth inch to one-half inch.
- E. The seedbed shall be firmed following seeding operations with a cultipacker, roller, or light drag.
- F. On sloping land, seeding operations shall be on the contour wherever possible.
- G. Mulch shall be applied, in the amounts described in the mulch section of this Specification, to protect the soil and provide a better environment for plant growth.
- H. New seed shall have adequate water for growth, through either natural means or irrigation, until plants are firmly established.
- I. Seeded areas shall be inspected at least weekly after planting and after each rainfall of one-half inch or more. Areas requiring additional seed and mulch shall be repaired within 48 hours.
- J. If vegetative cover is not established within 21 days, the area shall be reseeded.

3.04 PERMANENT SEED

- A. During site preparation, topsoil shall be stockpiled for use in establishing permanent vegetation.
- B. The site shall be graded as needed to permit the use of conventional equipment for seedbed preparation, seeding, mulch application, and anchoring.

- C. The needed erosion control practices, such as diversions, temporary waterways for diversion outlets, and sediment ponds, shall be installed prior to seeding.
- D. Prior to seeding, lime and fertilizer shall be worked into the soil with a disk harrow, springtooth harrow, or similar tools to a depth of four inches. On sloping areas, the final operation shall be on the contour.
- E. Where compacted soils occur, they shall be broken up sufficiently to create a favorable rooting depth of six to eight inches.
- F. The seed shall be applied uniformly with a cyclone seeder, drill, cultipacker, seeder, or hydroseeder (slurry may include seed and fertilizer) preferably on a firm, moist seedbed. Seed shall be sown no deeper than one-fourth inch to one-half inch.
- G. The seedbed shall be firmed following seeding operations with a cultipacker, roller, or light drag.
- H. On sloping land, seeding operations shall be on the contour wherever possible.
- I. Mulch shall be applied, in the amounts described in the mulch section of this Specification, to protect the soil and provide a better environment for plant growth.
- J. New seed shall have adequate water for growth, through either natural means or irrigation, until plants are firmly established.
- K. Seeded areas shall be inspected at least weekly after planting and after each rainfall of 0.5 inches or more. Areas requiring additional seed and mulch shall be repaired within 48 hours.
- L. If vegetative cover is not established (>70%) within 21 days, the area shall be reseeded. If 40 to 70 percent groundcover is established, seed and fertilize, using half of rates originally applied, and mulch. If less than 40 percent groundcover is established, follow original seedbed preparation methods, seeding and mulching specifications, and apply lime and fertilizer as needed according to soil tests.

3.05 SOD

- A. The area to be sodded shall be protected from excess runoff, as necessary, with appropriate BMPs.
- B. Prior to sodding, the soil surface shall be cleared of all trash, debris, and stones larger than one and one-half inches in diameter, and of all roots, brush, wire, and other objects that would interfere with the placing of the sod.
- C. Compacted soils shall be broken up sufficiently to create a favorable rooting depth of six to eight inches.
- D. Lime and fertilizer shall be worked into the soil with a disk harrow, springtooth harrow, or other suitable field equipment to a depth of four inches.
- E. After the lime and fertilizer have been applied and just prior to the laying of the sod, the soil in the area to be sodded shall be loosened to a depth of one inch. The soil shall be thoroughly dampened immediately after the sod is laid if it is not already in a moist condition.
- F. No sod shall be placed when the temperature is below 32°F. No frozen sod shall be placed nor shall any sod be placed on frozen soil.

- G. When sod is placed during the periods of June 15 to September 1 or October 15 to March 1, it shall be covered immediately with a uniform layer of straw mulch approximately one-half inch thick or so the green sod is barely visible through the mulch.
- H. Sod shall be carefully placed and pressed together so it will be continuous without any voids between the pieces. Joints between the ends of strips shall be staggered.
- I. On gutter and channel sodding, the sod should be carefully placed on rows or strips at right angles to the centerline of the channel (*i.e.*, at right angles to the direction of flow). The edge of the sod at the outer edges of all gutters shall be sufficiently deep so that surface water will flow over onto the top of the sod.
- J. On steep graded channels, each strip of sod shall be staked with at least two stakes not more than 18 inches apart.
- K. On slopes 3H:1V or steeper, or where drainage into a sod gutter or channel is one-half acre or larger, the sod shall be rolled or tamped and then chicken wire, jute, or other netting shall be pegged over the sod for protection in the critical areas. The netting and sod shall be staked with at least two stakes not more than 18 inches apart. The netting shall be stapled on the side of each stake within two inches of the top of the stake. The stake should then be driven flush with the top of the sod.
- L. When stakes are required, the stakes shall be wood and shall be approximately $\frac{1}{2}$ inch by $\frac{3}{4}$ inch by 12 inches. They shall be driven flush with the top of the sod with the flat side against the slope and on an angle toward the slope.
- M. Sod shall be tamped or rolled after placing and then watered. Watering shall consist of a thorough soaking of the sod and of the sod bed to a depth of at least 4 inches. The sod should be maintained in a moist condition by watering for a period of 30 days.
- N. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week to maintain moist soil to a depth of 4 inches. Watering shall be done during the heat of the day to prevent wilting. After the first week, sod shall be watered as necessary to maintain adequate moisture content.
- O. The first mowing of sod shall not be attempted until the sod is firmly rooted. No more than one-third of the grass leaf shall be removed by the initial and subsequent cuttings. Grass height shall be maintained between 2 inches and 3 inches.
- P. Where sod does not establish properly, the sod should be replaced immediately. Areas requiring resodding should be prepared in the same manner as the original installation.

3.06 ROAD/PARKING STABILIZATION

- A. The roadbed or parking surface shall be cleared of all vegetation, roots, and other objectionable material.
- B. All roadside ditches, cuts, fills, and disturbed areas adjacent to parking areas and roads shall be stabilized with appropriate temporary or permanent vegetation according to the applicable sections of this Specification.
- C. Geotextile filter fabric may be applied beneath the stone for additional stability in accordance with fabric manufacturer's specifications.
- D. Both temporary and permanent roads and parking areas may require periodic top dressing with new gravel. Seeded areas adjacent to the roads and parking areas shall be checked regularly to ensure that a vigorous stand of vegetation is maintained. Roadside ditches and

other drainage structures shall be checked once each week to ensure that they do not have silt or other debris that reduces their effectiveness.

3.07 CONSTRUCTION ENTRANCE

- A. Vegetation, roots, and all other obstructions shall be cleared in preparation for grading. Prior to placing geotextile (filter fabric), the entrance shall be graded and compacted to 80% of standard proctor density.
- B. To reduce maintenance and loss of aggregate, the geotextile shall be placed over the existing ground before placing the stone for the entrance. Stone shall be placed to depth of 6 inches or greater for the entire width and length of the stabilized construction entrance.
- C. If wash racks are used, they shall be installed according to manufacturer's specifications.
- D. The stabilized construction entrance shall be inspected once each week and after there has been a high volume of traffic or a storm event greater than 0.2 inches.
- E. The entrance shall be maintained in a condition that will prevent tracking or flow of sediments onto public rights-of-way. This may require periodic top dressing with additional stone, as conditions demand, and repair and/or cleanout of any structures used to trap sediment.
- F. All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains must be removed immediately.

3.08 DUST CONTROL

- A. See Articles on Temporary Seed, Permanent Seed, Sod, Mulch, Road/Parking Stabilization, and Construction Entrance of this Specification Section.
- B. When construction is active on the site, dust control shall be implemented as needed.
- C. When using tillage as a dust control measure, Contractor shall begin plowing on windward side of area. Chisel-type plows spaced about 12 inches apart, spring-toothed harrow, and similar plows are examples of equipment that may produce the desired effect.
- D. The site shall be observed daily for evidence of windblown dust and reasonable steps shall be taken to reduce dust whenever possible. When construction on a site is inactive for a period, the site shall be inspected at least weekly for evidence of dust emissions or previously windblown sediments. Dust control measures shall be implemented or upgraded if the site inspection shows evidence of wind erosion.

3.09 NETS AND MATS

- A. Nets and mats shall be installed according to the manufacturer's recommendations. In the event that the manufacturer's recommendations conflict with any requirement of this Specification, the most conservative requirement, in terms of protection of public health and the environment, shall govern.

3.10 TEMPORARY DIVERSION DITCH

- A. All dead furrows, ditches or other depressions to be crossed shall be filled before construction begins or as part of construction, and the earth fill used to fill the depressions shall be compacted using the treads of the construction equipment. All old terraces,

- fencerows, or other obstructions that will interfere with the successful operation of the diversion shall be removed.
- B. The base for the diversion ridge shall be prepared so that a good bond is obtained between the original ground and the fill material. Vegetation shall be removed and the base shall be thoroughly disked prior to placement of fill.
 - C. The earth materials used to construct the earth fill portions of the diversions shall be obtained from the diversion channel or other approved source.
 - D. The earth fill materials used to construct diversions shall be compacted by running the construction equipment over the fill in such a manner that the entire surface of the fill will be traversed by not less than one tread track of the equipment.
 - E. When an excess of earth material results from cutting the channel cross section and grade, it shall be deposited adjacent to the supporting ridge unless otherwise directed.
 - F. The completed diversion shall conform to the cross section and grade shown on the Construction Drawings.
 - G. Temporary or permanent seeding and mulch shall be applied to the berm or ditch immediately following its construction. Contractor shall triple-seed areas below the flow line, and shall use erosion control blankets or turf reinforcement mats as needed.
 - H. Bare and vegetated diversion channels shall be inspected regularly to check for points of scour or bank failure; rubbish or channel obstruction; rodent holes, breaching, or settling of the ridge; and excessive wear from pedestrian or construction traffic.
 - I. Damaged channels or ridges shall be repaired at the time damage is detected. Sediment deposits shall be removed from diversion channels and adjoining vegetative filter strips regularly.
 - J. Diversions shall be reseeded and fertilized as needed to establish vegetative cover.

3.11 LEVEL SPREADER

- A. The minimum acceptable width shall be 6 feet. The depth of the level spreader as measured from the lip shall be at least 6 inches and the depth shall be uniform across the entire length of the measure.
- B. The grade of the channel for the last 15 feet entering the level spreader shall be less than or equal to 1%.
- C. The level lip of the spreader shall be constructed on zero percent grade to insure uniform conversion of channel flow to sheet flow.
- D. Level spreaders shall be constructed on undisturbed soil.
- E. The entrance to the spreader shall be graded in a manner to insure that runoff enters directly onto the zero percent graded channel.
- F. Storm runoff converted to sheet flow shall discharge onto undisturbed areas stabilized with vegetation.
- G. All disturbed areas shall be stabilized immediately after construction is completed in accordance with the mulching and vegetation requirements of this Specification.

- H. The level spreader shall be inspected after each storm event and at least once each week. Any observed damage shall be repaired immediately.

3.12 PERMANENT CONSTRUCTED WATERWAY

- A. All ditches or other depressions to be crossed shall be filled before construction begins or as part of construction, and the earth fill used to fill the depressions shall be compacted using the treads of the construction equipment. All old terraces, fence rows, or other obstructions that will interfere with the successful operation of the channel shall be removed.
- B. The earth materials used to construct the earth fill portions of the channel shall be obtained from the excavated portion of the channel or other approved source.
- C. The earth fill materials used to construct the channel shall be compacted by running the construction equipment over the fill in such a manner that the entire surface of the fill will be traversed by at least one tread track of the equipment.
- D. The completed channel shall conform to the cross section and grade shown on the Construction Drawings.
- E. Channels shall be inspected regularly to check for points of scour or bank failure; rubbish or channel obstruction; rodent holes; breaching; and excessive wear from pedestrian or construction traffic.
- F. Channels shall be repaired at the time damage is detected. Sediment deposits shall be removed from adjoining vegetative filter strips when they are visible.
- G. Channels shall be reseeded and fertilized as needed to establish vegetative cover.
- H. The subgrade of paved channels shall be constructed to the required elevations. All soft sections and unsuitable material shall be removed and replaced with suitable material. The subgrade shall be thoroughly compacted and shaped to a smooth, uniform surface. The subgrade shall be moist when pouring concrete.
- I. Before permanent stabilization of the slope, the structure shall be inspected after each rainfall. Any damages to the paved channel or slope shall be repaired immediately.

3.13 PIPE SLOPE DRAIN

- A. The pipe slope drain shall be placed on undisturbed or well-compacted soil.
- B. Soil around and under the entrance section shall be hand-tamped in 4-inch to 8-inch lifts to the top of the dike to prevent piping failure around the inlet.
- C. Filter fabric shall be placed under the inlet and extended 5 feet in front of the inlet and be keyed in 6 inches on all sides to prevent erosion.
- D. Backfilling around and under the pipe with stable soil material hand compacted in lifts of 4 inches to 8 inches shall be done to ensure firm contact between the pipe and the soil at all points.
- E. The pipe slope drain shall be securely staked to the slope using grommets provided for this purpose at intervals of 10 feet or less.
- F. All slope drain sections shall be securely fastened together and have watertight fittings.
- G. The pipe shall be extended beyond the toe of the slope and discharged at a non-erosive velocity into a stabilized area or to a sediment trap or pond.

- H. The pipe slope drain shall have a minimum slope of 3 percent or steeper.
- I. The height at the centerline of the earth dike shall range from a minimum of 1.0 foot over the pipe to twice the diameter of the pipe measured from the invert of the pipe. It shall also be at least 6 inches higher than the adjoining ridge on either side. At no point along the dike will the elevation of the top of the dike be less than 6 inches higher than the top of the pipe.
- J. All areas disturbed by installation or removal of the pipe slope drain shall be immediately stabilized.
- K. The pipe slope drain shall be inspected after every rainfall and at least weekly. Any necessary repairs shall be made immediately.
- L. Contractor shall check to see that water is not bypassing the inlet and undercutting the inlet or pipe. If necessary, Contractor shall install headwall or sandbags.
- M. Contractor shall check for erosion at the outlet point and shall check the pipe for breaks or clogs. Contractor shall install additional outlet protection if needed and immediately repair the breaks and clean any clogs.
- N. Contractor shall not allow construction traffic to cross the pipe slope drain and shall not place any material on it.
- O. If a sediment trap has been provided, it shall be cleaned out when the sediment level reaches $\frac{1}{3}$ the design volume.
- P. The pipe slope drain shall remain in place until the slope has been completely stabilized or up to 30 days after permanent slope stabilization.

3.14 IMPACT STILLING BASIN

- A. Construction specifications for impact stilling basins are provided in the Construction Drawings.

3.15 CHECK DAM

- A. Stone shall be placed by hand or mechanically as necessary to achieve complete coverage of the ditch and to ensure that the center of the dam is at least 1 foot lower than the outer edges. Stone shall also be placed to extend 3 feet in elevation above the center portion of the check dam or to the top of the channel side slopes.
- B. Coir and wood fiber logs shall be laid on the channel bottom.
- C. Check dams shall be removed when their useful life has been completed. In temporary ditches and swales, check dams shall be removed and the ditch filled in when it is no longer needed. In permanent channels, check dams shall be removed when a permanent lining can be installed. In the case of grass-lined ditches, check dams shall be removed when the grass has matured sufficiently to protect the ditch or swale. The area beneath the check dams shall be seeded and mulched or sodded (depending upon velocity) immediately after check dams are removed.
- D. If stone check dams are used in grass-lined channels that will be mowed, care shall be taken to remove all stone from the channel when the dam is removed. This shall include any stone that has washed downstream.
- E. Regular inspections shall be made to ensure that the check dam is in good working order and

the center of the dam is lower than the edges. Erosion caused by high flows around the edges of the dam shall be corrected immediately, and the dam shall be extended beyond the repaired area.

- F. Check dams shall be checked for sediment accumulation after each rainfall. Sediment shall be removed before or when it reaches one-third of the original height.
- G. Check dams shall remain in place and operational until the drainage area and channel are completely stabilized, or up to 30 days after the permanent site stabilization is achieved.

3.16 SEDIMENT TRAP

- A. The area to be excavated shall be cleared of all trees, stumps, roots, brush boulders, sod, and debris. All channel banks and sharp breaks shall be sloped to no steeper than 1:1. All topsoil containing excessive amounts of organic matter shall be removed.
- B. Seeding, fertilizing, and mulching of the material taken from the excavation shall comply with the applicable soil stabilization sections of this Specification.
- C. Construction specifications for sediment traps are provided in the Construction Drawings.
- D. Any material excavated from the trap shall be placed in one of the following ways so that it will not be washed back into the trap by rainfall:
 - 1. uniformly spread to a depth not exceeding 3 feet and graded to a continuous slope away from the trap
 - 2. uniformly placed or shaped reasonably well with side slopes assuming the natural angle of repose for the excavated material behind a berm width not less than 12 feet.
- E. Sediment shall be removed from the trap when the capacity is reduced to one third of the design volume. Contractor shall follow the methods for disposing of sediment removed from the trap as shown in the Construction Drawings.

3.17 SEDIMENT POND

- A. The foundation area shall be cleared of all trees, stumps, roots, brush boulders, sod, and debris. All channel banks and sharp breaks shall be sloped to no steeper than 1:1. All topsoil containing excessive amounts of organic matter shall be removed. The surface of the foundation area shall be thoroughly scarified before placement of the embankment material.
- B. A cutoff trench shall be backfilled with suitable material. The trench shall be kept free of standing water during backfill operations.
- C. The pipe conduit barrel shall be placed on a firm foundation. Selected backfill material shall be placed around the conduit in layers, and each layer shall be compacted to at least the same density as the adjacent embankment. All compaction within 2 feet of the pipe spillway shall be accomplished with hand-operated tamping equipment.
- D. All borrow areas outside the pond and in the drainage area shall be graded and left in such a manner that water will not be ponded.
- E. The material placed in the fill shall be free of all sod, roots, frozen soil, stones more than 6 inches in diameter, and other objectionable material. The placing and spreading of the fill material shall occur in approximately 6-inch horizontal layers or of such thickness that the required compaction can be obtained with the equipment used. Each layer shall be compacted in a way that will result in achieving 95 percent of the maximum standard dry

density.

- F. The distribution and gradation of materials throughout the fill shall be such that there will be no lenses, pockets, stakes, or layers of material differing substantially in texture or gradation from the surrounding material. Where it is necessary to use materials of varying texture and gradation, the more impervious material shall be placed in the upstream and center portions of the fill.
- G. The moisture content of fill material shall be such that the required degree of compaction can be obtained with the equipment used.
- H. Fill shall not be placed on frozen, slick, or saturated soil.
- I. The topsoil material saved in the site preparation shall be placed as a top dressing on the surface of the emergency spillways, embankments, and borrow areas. It shall be evenly spread.
- J. A protective cover of herbaceous vegetation shall be established on all exposed surfaces of the embankment, spillway, and borrow areas to the extent practical under prevailing soil and climatic conditions.
- K. Seedbed preparation, seeding, fertilizing, and mulching shall comply with the applicable sections of this Specification.
- L. Any material excavated from the pond shall be placed in one of the following ways so that its weight will not endanger the stability of the side slopes and where it will not be washed back into the pond by rainfall:
 - 1. uniformly spread to a depth not exceeding 3 feet and graded to a continuous slope away from the pond.
 - 2. uniformly placed or shaped reasonably well with side slopes assuming the natural angle of repose for the excavated material behind a berm width not less than 12 feet.
- M. Sediment shall be removed from the pond when the capacity is reduced to one third of the design volume. Contractor shall follow the methods for disposing of sediment removed from the pond as shown in the Construction Drawings.

3.18 SILT FENCE

- A. This Article provides construction specifications for silt fences using synthetic fabric. See the Construction Drawings for additional detail.
- B. Posts shall be spaced a maximum of 10 feet apart at the barrier location and driven securely into the ground (minimum of 12 inches). When necessary because of rapid runoff, post spacing shall not exceed 6 feet.
- C. A trench shall be excavated at least 6 inches wide and 6 inches deep along the line of posts and upslope from the barrier.
- D. A wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy-duty wire staples at least 1 inch long, tie wires or hog rings. The wire shall extend into the trench a minimum of 2 inches and shall not extend more than 36 inches above the original ground surface.
- E. The filter fabric shall be stapled or wired to the fence, and 12 inches of the fabric shall be extended into the trench. The fabric shall not extend more than 30 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.

- F. At joints, filter fabric shall be lapped with terminating posts with a minimum overlap of 3 feet.
- G. The trench shall be backfilled and soil compacted over the filter fabric.
- H. Silt fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.
- I. Silt fences and filter barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately. Knocked down fences shall be repaired at the end of each day.
- J. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and if the barrier is still necessary, the fabric shall be replaced promptly.
- K. Sediment deposits shall be removed after each storm event or when deposits reach approximately one-third the height of the barrier.
- L. Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform to the existing grade, prepared, and seeded.
- M. Silt fences shall be replaced every 6 months.

3.19 STORM DRAIN INLET PROTECTION

- A. For silt fence drop inlet protection, the following specifications apply:
 - 1. For stakes, Contractor shall use 2 x 4-inch wood (preferred) or equivalent metal with a minimum length of 3 feet.
 - 2. Stakes shall be evenly spaced around the perimeter of the inlet a maximum of 3 feet apart and securely driven into the ground, approximately 18 inches deep.
 - 3. To provide needed stability to the installation, Contractor shall frame with 2 x 4-inch wood strips around the crest of the overflow area at a maximum of 1.5 feet above the drop inlet crest and shall brace diagonally.
 - 4. Contractor shall place the bottom 12 inches of the fabric in a trench and backfill the trench with at least 4 inches of crushed stone or 12 inches of compacted soil.
 - 5. Contractor shall fasten fabric securely to the stakes and frame. Joints shall be overlapped to the next stake.
- B. For sod drop inlet protection, sod shall be placed to form a turf mat covering the soil for a distance of 4 feet from each side of the inlet structure. Soil preparation and sod placement shall be in accordance with the section entitled Sod.
- C. For gravel curb inlet protection, the following specifications apply:
 - 1. Wire mesh with ½-inch openings shall be placed over the curb inlet opening so that at least 12 inches of wire extends across the concrete gutter from the inlet opening.
 - 2. KYTC No. 2 Coarse Aggregate shall be piled against the wire so as to anchor it against the gutter and inlet cover and to cover the inlet opening completely.
 - 3. This type of device must never be used where overflow may endanger an exposed fill slope. Consideration shall also be given to the possible effects of ponding on traffic movement, nearby structures, working areas, and adjacent property.

- D. For block and gravel curb inlet protection, the following specifications apply:
1. Two concrete blocks shall be placed on their sides abutting the curb at either side of the inlet opening to act as spacer blocks.
 2. A 2-inch by 4-inch stud shall be cut and placed through the outer holes of each spacer block to help keep the front blocks in place.
 3. Concrete blocks shall be placed on their sides across the front of the inlet and abutting the spacer blocks.
 4. Wire mesh shall be placed over the outside of the concrete blocks to prevent stone from being washed through the holes in the blocks. Wire with ½-inch openings shall be used
 5. KYTC No. 2 Coarse Aggregate shall be piled against the wire to the top of the barrier.
- E. For stone-filled corrugated pipe curb inlet protection, the following specifications apply:
1. Two concrete "L" blocks shall be placed on their sides, with one leg fitting into the mouth of the curb opening.
 2. A 6-inch corrugated pipe shall be filled with stone and covered with a filter sock.
 3. The stone-filled pipe will be placed in front of the two concrete "L" blocks, and extend a minimum of the width of the curb inlet opening on either side. The total length of the stone filled pipe shall be three times the width of the curb inlet opening.
- F. The structure shall be inspected after each rain, and repairs made as needed.
- G. Sediment shall be removed and the device restored to its original dimensions when the sediment has accumulated to one-third the design depth of the filter. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.
- H. If a stone filter becomes clogged with sediment so that it no longer adequately performs its function, the stone must be pulled away from the blocks, cleaned, and replaced.
- I. Structures shall be removed after the drainage area has been properly stabilized.

3.20 FILTER STRIP

- A. When planting filter strips, Contractor shall prepare seedbed, incorporate fertilizer, and apply mulch consistent with the seeding sections of this Specification. Filter strips using areas of existing vegetation shall be over seeded, as necessary, with the specified mixtures to obtain an equivalent density of vegetation. The over seeding shall be accomplished prior to any land disturbing activities.
- B. Filter strips shall be inspected regularly to ensure that a healthy vegetative growth is maintained. Any bare spots or spots where sediment deposition could lead to the destruction of vegetation shall be repaired.
- C. Filter strips shall be fertilized once each year in the fall.
- D. Irrigation shall be used as necessary to maintain the growth of the vegetation in the filter strip.
- E. Sediment shall be removed when it becomes visible in the filter.
- F. Construction traffic shall not be driven on or over filter strips.

3.21 STREAM CROSSING

- A. Clearing and excavation of the streambed and banks shall be kept to a minimum.
- B. The structure shall be removed as soon as it is no longer necessary for project construction.
- C. Upon removal of the structure, the stream shall immediately be reshaped to its original cross section and properly stabilized.
- D. The approaches to the structure shall consist of stone pads with a minimum thickness of 6 inches, a minimum width equal to the width of the structure, and a minimum approach length of 25 feet on each side.
- E. The structure shall be inspected after every rainfall and at least once a week and all damages repaired immediately.

3.22 PUMP-AROUND FLOW DIVERSION

- A. Operations shall be scheduled such that diversion installation, in-stream excavation, in-stream construction, stream restoration, and diversion removal are completed as quickly as possible. Contractor shall not construct in a stream when rainfall is expected during the time excavation will be occurring in the stream.
- B. Check dams shall be installed across the stream during low flow conditions.
- C. Stream flow shall be pumped around the check dams. Outlet protection shall be installed as required at the discharge point.
- D. Contractor shall dewater the work area and pump into a sediment trapping device.
- E. Contractor shall complete construction activities across the stream.
- F. Contractor shall restore the streambed and banks.
- G. Contractor shall remove sandbags and shut down pumping operation. (Salvage sandbags for future use if multiple stream crossings are required on the project.) Contractor shall remove all sandbags from the stream, including damaged and empty bags.
- H. Pumps shall be manned around-the-clock when the pump-around diversion is in the stream.
- I. This control provides short-term diversion of stream flow (typically 1 day to 3 days). Additional sandbags or pumps may be required to maintain 1-foot freeboard on the sandbag checks if flow conditions change.
- J. Contractor shall add sandbags as required to seal leaks in checks.

3.23 CONSTRUCTION DEWATERING

- A. Contractor shall follow the specifications for sediment traps and basins. The manufacturer's recommendations shall be followed for commercial products.
- B. The dewatering structure shall be inspected frequently to ensure it is functioning properly and not overtopping. Accumulated sediment shall be spread out on site and stabilized or disposed of offsite.

3.24 KPDES GENERAL PERMIT FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

- A. The Contractor is responsible for electronically filing the appropriate state Notice of Intent (NOI-SWCA) letter at least seven (7) days prior to start of construction activity. The Notice of Intent (NOI) is a Kentucky Pollution Discharge Elimination System (KPDES) permit application as provided by the Kentucky Revised Statutes, Chapter 224. This application is required to be submitted for construction projects that disturb one or more acres of land.
- B. The NOI requires the inclusion of the descriptions of (but is not limited to) the following items:
 - 1. Names and designated uses of any receiving waters
 - 2. Anticipated number and locations of discharge points
 - 3. Identification of planned construction in or along a water body
- C. A topographic map showing project boundaries, areas to be disturbed, locations of anticipated discharge points and receiving waters is also required to be submitted with the NOI.
- D. If the construction site is near a designated "High Quality/Impaired Waters" or a "Cold Water Aquatic Habitat Waters, Exceptional Waters, Outstanding National/State Resource Waters," additional items and/or individual permits will be required.
- E. The NOI form requires an SIC code. The link to the SIC codes is <http://www.osha.gov/pls/imis/sicsearch.html>. The following are the typical construction SIC codes utilized:
 - 1542 – Building Construction, nonresidential, except industrial and warehouses
 - 1623 – Water Main Construction, Sewer Construction
 - 1629 – Water and Wastewater Treatment Plant Construction
 - 1711 – Water Pump Installation
 - 1781 – Drilling Water Wells
- F. The Contractor is responsible for the description of procedures to maintain erosion and sediment control measures during the period of construction.
- G. The Contractor shall not start land disturbing activities until written permit coverage is obtained from the Kentucky Division of Water.
- H. The inspection by qualified personnel, **provided by the Contractor**, of the site as follows:
 - 1. at least once every seven (7) calendar days, and
 - 2. within 24 hours after any storm event of 0.5 inch or greater
- I. The Contractor is responsible for completing and maintaining the required Self-Inspection Forms. A sample is included in this specification Section.
- J. Amendments to shall be made and implemented as necessary through the course of the construction project if inspections or investigations by the Contractor's inspector, site staff, or by local, state, or federal officials determine that the existing sediment control measures, erosion control measures, or other site management practices are ineffective in eliminating or significantly minimizing pollutants in storm water discharges from the construction site. All plan amendments shall be noted and maintained at the project site.

- k. All excess earthen/rock materials hauled off the site to shall be hauled to a site permitted by the Kentucky Division of Water. The haul site must be permitted in accordance with these specifications.

Kentucky Best Management Practices Plan • Construction Site Inspection Report

Company:	Site:	County:
Site Operator:		Date:
Receiving Water:	Total Site Area (acres):	# Disturbed Acres:
Inspector Name:	Inspector Qualifications:	
Inspection Type: Weekly or ½ Inch Rain	Days Since Last Rainfall _____	# Inches of Last Rainfall: _____

Field Inspection Observations

BMP Category	Compliance			Field Indicators for Compliance
	Yes	No	N/A	
Project Operations				Notice of Intent (KPDES permit) and other local/state permits on file BMP Plan on site and available for review Project timing/schedule and activities following BMP Plan Weekly inspection and rain-event reports on BMPs available for review Diversions, silt checks/traps/basins, and silt fences/barriers installed prior to clearing Grading and clearing conducted in phases to minimize exposed soil areas No vegetation removal or operations in stream or sinkhole buffer area (25-50 ft min) Rock pad in place on all construction site exits leading to paved roads No sediment, mud, or rock on paved public roads in project area Dust control if needed when working in residential areas during dry conditions
Drainage Management				Upland runoff diverted around bare soil areas with vegetated/lined ditches/berms Drainage channels exiting the site are lined with grass/blanket/rock and stabilized Discharges from dewatering operations cleaned in silt fence enclosure or other filter No muddy runoff leaving site after rains up to 1½ inches
Erosion Protection				Exposed soil seeded/mulched after 2 weeks if no work is planned for the next 7 days Soils on steep slopes seeded/mulched/blanketed as needed to prevent rutting
Sediment Barriers				Silt fence, rock filter, or other sediment barrier below all bare soil areas on slopes Barrier installed across slope on the contour, trenched in, posts on downhill side Multiple sediment barriers at least 125 ft apart on unseeded slopes steeper than 4:1 J-hook interceptors along silt fence where heavy muddy flows run along fencing No visible undercutting or bypassing or blowout of sediment barrier Accumulated sediment is less than halfway to the top of sediment barrier
Slope Protection				Slopes tracked, disked, or conditioned after final grade is established Slopes seeded, mulched, or blanketed within 21 days, no unmanaged rills or gullyng Heavy downslope flows controlled by lined downdrain channels or slope drain pipes No muddy runoff from slopes into streams, rivers, lakes, or wetlands
Inlet Protection				Inlet dam/device or filtration unit placed at all inlets receiving muddy flows No visible undercutting, bypassing, or blowout of inlet protection dam or device Accumulated sediment is less than halfway to the top of the inlet protection dam/device
Outlet Protection				High flow discharges have rock or other flow dissipaters of adequate sizing at outlet Culvert outlets show no visible signs of erosion/scour, bank failure, or collapse
Ditch and Channel Stabilization				No unmanaged channel bank erosion or bottom scouring visible within or below site Ditches with slopes more than 3% have check dams spaced as needed, if not grassed Ditch check dams tied in to banks, with center 4" lower than sides, and no bypassing Ditches with slopes of up to 5% are thickly seeded with grass (minimum requirement) Ditches 5% to 15% are lined with thick grass and erosion control blankets as needed Ditches 15% to 33% are lined with thick grass and matting or other approved product Ditches exceeding 33% are paved or lined with rock or other approved product

[illegible]

Signature of Inspector: _____

SECTION 02220.1 EARTHWORK

PART 1 - SCOPE

This section covers the required topsoil removal, excavation, the removal and proper utilization or disposal of all excavated materials, necessary borrow, fill requirements, and the shaping and finishing of all excavation work to the required lines and grades.

PART 2 - TOPSOIL REMOVAL

All topsoil on areas to receive fill shall be stripped and stockpiled at an approved location.

PART 3 - STRUCTURAL EXCAVATION

Structural excavation shall consist of and include the removal of all materials encountered or involved in the excavation and subgrade preparation for the placing of structures. The final depths and extent of structural excavation will be determined by the nature of the material encountered; however, after excavation to the limits as shown on the drawings, the ENGINEER shall inspect the work and determine if additional excavation is required.

PART 4 - EXCAVATION CONSTRUCTION METHODS

4.01 Open Cut Excavation _ General

All open cut excavation shall be performed in accordance with this section to the lines, grades, and dimensions shown on the drawings or established by the ENGINEER.

All necessary precautions shall be taken to preserve the material below and beyond the lines of all excavation in the soundest possible condition. Any damage to the work due to the CONTRACTOR's operations, including shattering of the material beyond the required excavation lines, shall be repaired at the expense of and by the CONTRACTOR. Any and all excess excavation for any purpose or reason, whether or not due to the fault of the CONTRACTOR, except as may be ordered in writing by the ENGINEER, shall be at the expense of the CONTRACTOR. Where required to complete the work, all such excess excavation and over excavation shall be refilled with materials furnished and placed at the expense of and by the CONTRACTOR. Slopes shattered or loosened by blasting shall be taken down at the expense of and by the CONTRACTOR.

All excavation for embankment and structure foundations shall be performed in the dry. No excavation shall be made in frozen materials without written approval.

The bottom and side slope rock or shale upon or against which concrete or pervious blanket material is to be placed shall be excavated to the required dimensions as shown on the drawings or established by the ENGINEER. No material will be permitted to extend within the neat lines of the structure. If, at any point in rock or shale upon written orders from the ENGINEER, material is excavated beyond the limits required to receive the structure, the additional excavation shall be filled solidly with concrete. If material is excavated beyond the limits required to receive the

structure without written orders from the ENGINEER, the additional excavation shall be brought back to grade with "Class A" concrete at the CONTRACTOR'S expense.

4.02 Utilization of Excavated Material

All suitable material removed from the excavations shall be used, insofar as practicable, in constructing the permanent works and at such other places as directed. The CONTRACTOR shall not waste materials removed from excavations and suitable for use in the construction of the permanent works, without a written application to do so and a written approval from the ENGINEER.

4.03 Disposal of Surplus and/or Waste Material

All surplus excavated material and/or all waste materials shall be disposed of by widening embankments, fills, or by flattening slopes, or by depositing the material in other areas as designated or directed by the ENGINEER.

Waste material shall be placed in designated waste areas to the approximate elevations established by the ENGINEER and the surfaces thereof shall be left in a neat and slightly condition and sloped to provide positive drainage. Compaction of the waste materials shall be required.

4.04 Blasting for Excavation

- A. General _ Blasting may be done only to the depth, amount, and extent, and in such locations approved by the ENGINEER. Approval of the methods of blasting by the ENGINEER will not relieve the CONTRACTOR of his responsibility in blasting operation. No payment will be made for any necessary extra excavation below or outside of the limit lines indicated on the drawings, or modifications thereof, due solely to injury caused by overshooting, improper blasting, or carelessness on the part of the CONTRACTOR. All material thus removed shall be replaced by concrete when a concrete structure is to be placed upon or against such surface, or by compacted fill material when fill is to be placed thereon, at the expense of the CONTRACTOR in a manner satisfactory to the ENGINEER. Extra fill is to be of the same type as that to be placed directly above it.
- B. Blasting Trench and/or Structure Excavation _ The use of explosives or blasting material of any kind in trench excavation and/or the structure excavation shall be carried out by using not over one half (1/2) pound of explosives (equivalent in strength to 40 percent dynamite) per cubic yard of material to be blasted and by shooting only a few holes simultaneously.
- C. Use of Explosives _ the transportation, handling, storage, and use of dynamite and other explosives shall be directed and supervised by a person of proven experience and ability in blasting operation. All blasting operations shall be in accordance with applicable local, state, and federal laws. Before any explosives are brought on the job, permission to do so shall be obtained from the ENGINEER. All blasts shall be fired electrically with an electric blasting machine. Where detonating cord is used as a detonating agent, the

detonation cord shall be fired with an electric blasting cap. Delay electric detonators shall be used for all delayed blasts. Blasting machines used for firing shall be known to be in good condition and of sufficient capacity to fire all charges. Rubber covered or other adequately insulated copper wires in good condition shall be used for firing lines and shall have solid cores of appropriate gage. Sufficient firing lines shall be provided to permit the blaster to be located at a safe distance from the blast. Single conductor lead lines shall be used. All operations involving the handling or use of explosives shall be discontinued during approach of a thunderstorm or while it are in progress. Blasting operations in the proximity of overhead power lines, communication lines, or other structures shall not be carried on until the operator and/or OWNER of such lines has been notified and precautionary measures deemed necessary have been taken. All holes loaded on a shift shall be fired on the same shift. The use of black powder is prohibited. Before any drilling operations in preparation for blasting are started, the CONTRACTOR shall furnish the ENGINEER a detailed plan of operations showing the method proposed for the prevention of damage. In order to assure adequate protection, such plan may be modified to meet the conditions that may develop.

4.05 Sheeting and Bracing

Sheeting and bracing as may be required to safely support the sides of excavations while maintaining the required side slopes shall comply with the safety precautions as outlined in current and accepted safety manuals, such as "Associated General Contractors Manual of Accident Prevention in Construction." Where sheeting and bracing are necessary to prevent caving of the walls of excavations and to safeguard the workmen, the excavations shall be dug to such widths that proper allowance is made for the space occupied by the sheeting and bracing. The CONTRACTOR shall perform the additional excavation required and furnish and put in place the necessary sheeting and bracing and shall remove the same as the excavation is filled, at his own expense.

4.06 Removal of Water

The CONTRACTOR shall construct and maintain all necessary channels, flumes, and/or other temporary diversion and protective works; shall furnish all materials required therefore; and shall furnish, install, maintain and operate all well points, casings, pumps and other equipment for dewatering the various parts of the work and for maintaining the foundations, trenches and other parts of the work free from water as required for constructing each part of the work. After having served their purpose, all temporary protective works shall be removed, or leveled to give a slightly appearance and so as not to interfere in any way with the operation, usefulness or stability of the permanent structures.

4.07 Protection of Finished Structure Excavations

It shall be the CONTRACTOR's responsibility to maintain finished excavated foundation surfaces for the works in good condition until such time as the structures are placed on or against the surfaces.

4.08 Borrow

Borrow excavation shall consist of and include the required excavation and proper utilization of approved materials obtained from designated areas when sufficient quantities of suitable materials are not available from other required excavation.

The control of excavation in any borrow area and the selection of materials therefrom shall at all times be as directed by the ENGINEER. On completion of excavation, all borrow pits shall be left in a neat and slightly condition. Unless otherwise approved by the ENGINEER, all borrow pits shall be so graded and dressed that water will readily drain therefrom, and away from all embankments, berms and structures. When shown on the drawings, terraces, or diversions shall be constructed to protect the slopes of the borrow areas from erosion and shall be considered a subsidiary of this specification.

PART 5 - FILL

After clearing operations have been completed, all structure locations shall be proof rolled with a loaded pan or heavy pneumatic tired vehicle to densify upper soils and to locate possible areas, which will require undercutting, removal and/or recompaction. This operation shall be conducted under the surveillance of the ENGINEER.

5.01 Fill Material Approval

Before initiating filling operations, the CONTRACTOR shall receive approval of fill material by the ENGINEER. Several laboratory Proctor density tests shall be run on representative samples obtained from the proposed borrow materials.

5.02 Placement of Fills

Where structures or other appurtenances are constructed on fill, the fill shall be placed in layers not over six inches deep, (as measured before compaction) and thoroughly compacted.

5.03 Compaction

Compaction may be obtained by use of a sheepsfoot roller or pneumatic tired roller. Water shall be applied as directed to obtain close adhesion between layers and all parts of the material. Fill shall be compacted to a minimum of 95% of the Standard Proctor maximum dry density (ASTM Specifications D_698). A minimum of two (2) compaction tests per each two feet of fill on a structure location shall be run by an experienced soils engineering technician.

In order to prevent damage to existing structures, heavy construction equipment shall not be allowed to operate within approximately eight feet horizontally of the existing structure exterior wall.

PART 6 - BACKFILLING AROUND STRUCTURES

Only suitable material approved by the ENGINEER shall be used for backfilling around structures.

Backfilling around structures shall have material placed in layers of six inch depth and compacted by pneumatic tools or other small equipment operated by hand. In no case, shall the backfilling be allowed to obtain an elevation of one foot above any other area. It shall be uniformly compacted throughout the structure depth. Any deviation shall be cause for the ENGINEER to require the material deposited to be removed and recompacted at the CONTRACTOR's expense.

All backfilling shall be done in such a manner that the pipe or structure over or against which it is being placed will not be disturbed or injured. Any pipe or structure injured, damaged or moved from its proper line or grade during backfilling operations shall be removed or repaired to the satisfaction of the ENGINEER.

PART 7 - PRE-LOADING OF STRUCTURES

All tanks shall be pre-loaded with water prior to making final pipe connections. Elevations of structures shall be monitored until settlement has virtually ceased.

PART 8 - BACKFILLING TRENCHES

The backfill shall be in accordance with other applicable sections of these specifications.

PART 9 - FINISH GRADING

Finish grading shall be to the finished elevations and grades shown, and shall be made to blend into conformation with remaining natural ground surfaces. All finish graded surfaces shall be left smooth and free to drain. Areas to be grassed shall be prepared according to Section H. Excess materials shall be spread and compacted as directed. Grading within the construction area and around the outside of building structure lines shall be performed in a manner, which will prevent accumulation of water within the area. Where necessary, or where shown, finish grading shall be extended to insure that water will be directed to drainage ditches, and the site area left smooth and free from depressions holding water.

PART 10 - MAINTENANCE

All excavated and filled areas for structures, trenches, fills, topsoil areas, embankments and channels shall be maintained by the CONTRACTOR in good condition at all times until final acceptance by the OWNER. The CONTRACTOR shall maintain trench backfill at the original ground surface by periodically adding specified backfill material as necessary or when directed by the ENGINEER. Such maintenance shall be continued until final acceptance of the project.

PART 11 - PAYMENT

Payment for all excavation and fill work shown on the Drawings and herein specified, that is required to complete the clearing, grubbing, site grading, roads, structural excavation, trench excavation, borrow excavation, backfill, sheeting, shoring, topsoil, crushed stone or gravel, drainage, pumping embankment fills and any other excavation and fills required to construct the lines as shown on the Drawings shall be included in the unit price bid in the BID Schedule and no measurement of the quantities will be made. The contours and elevations of the present ground are believed to be reasonably correct, but are not guaranteed. The CONTRACTOR shall satisfy himself by actual examination of the site of the work as to the existing elevations and contours and the amount of work required under this Section.

The cost of all soils inspections and testing shall be paid by the OWNER. If compaction tests do not meet required values, the cost of additional testing as required the ENGINEER shall be paid by the CONTRACTOR.

All soils inspection and testing shall be performed by experienced competent personnel acceptable to the ENGINEER and OWNER. Laboratory tests shall be performed in facilities qualified by Kentucky Department of Transportation.

**SECTION 02610
PIPE AND FITTINGS**

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide all labor, materials, equipment, incidentals, and services required for furnishing and installing all interior and exterior piping and fittings specified herein. Piping herein specified includes sludge, sanitary process, water, air, storm sewer and large diameter gravity sewer piping and associated thrust restraints. Refer to the pipe material schedule shown on the Drawings to determine which pipe materials are acceptable for each application. Replace all existing piping that interferes with installation of new pipe or that is damaged by new pipe installation in a manner approved by the ENGINEER.
- B. Coordination:
 - 1. Review installation procedures under this and other Sections and coordinate installation of items to be installed with or before pipe and fittings work.

1.2 RELATED WORK

- A. Section 02220 – Earthwork
- B. Section 15100 – Valves, Hydrants, and Fluid Transport Appurtenances

1.3 REFERENCES

- A. Standards referenced in this Section are listed below:
 - 1. American Association of State Highway and Transportation Officials.
 - a. AASHTO Standard Specifications.
 - 2. American National Standards Institute.
 - a. ANSI B18.2.1, Square and Hex Bolts and Screws Inch Series.
 - b. ANSI B18.2.2, Square and Hex Nuts. (Inch Series).
 - 3. ASTM International.
 - a. ASTM A193, Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
 - b. ASTM A194, Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
 - c. ASTM A307, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
 - d. ASTM A563, Specification for Carbon and Alloy Steel Nuts.
 - e. ASTM A575, Standard Specification for Steel Bars, Carbon, Merchant Quality, M-Grades.
 - f. ASTM D5162, Practice for Discontinuity (Holiday) Testing of Non-Conductive Protective Coating on Metallic Substrates.

- g. ASTM G14, Test Method for Impact Resistance of Pipeline Coatings (Falling Weight Test).
 - h. ASTM D1784, Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
 - i. ASTM F477, Elastomeric Seals (Gaskets) for joining plastic pipe.
 - j. ASTM D3139, Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
 - k. ASTM F477, Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
 - l. ASTM D 2837, Standard test method for Obtaining HDB for Thermoplastic Pipe Materials.
 - m. ASTM C443
 - n. ASTM C478
 - o. ASTM D1785 and D1784
 - p. ASTM D2467
 - q. ASTM D2564
4. American Water Works Association.
- a. AWWA C104, Cement-Mortar Lining for Ductile Iron Pipe and Fittings for Water.
 - b. AWWA C105, Polyethylene Encasement for Ductile-Iron Pipe Systems.
 - c. AWWA C110, Ductile Iron and Gray Iron Fittings.
 - d. AWWA C111, Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings.
 - e. AWWA C115, Flanged Ductile Iron Pipe with Ductile Iron or Gray Iron Threaded Flanges.
 - f. AWWA C116, Protective Fusion-Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile Iron and Gray Iron Fittings.
 - g. AWWA C150, Standard for Thickness Design of Ductile Iron Pipe.
 - h. AWWA C151, Ductile Iron Pipe, Centrifugally Cast.
 - i. AWWA C153, Ductile Iron Compact Fittings for Water Service.
 - j. AWWA C900, Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In.-12 In. (100 mm-300 mm), for Water Transmission and Distribution
 - k. AWWA C905, Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In.-48 In. (350 mm-1,200 mm).
 - l. AWWA C907, Injection-Molded Polyvinyl Chloride (PVC) Pressure Fittings, 4 In. Through 12 In. (100 mm Through 300 mm).
5. NSF International
- a. NSF 61, Drinking Water System Components – Health Effects
6. The Society for Protective Coatings.
- a. SSPC Painting Manual, Volume 1, Para. XIV.
 - b. SSPC PA 2, Measurement of Dry Coating Thickness with Magnetic Gages.
7. Manufacturers Standardization Society of the Valve and Fittings Industry.
- a. MSS SP-60, Connecting flange joint between tapping sleeves and tapping valves.
8. National Association of Corrosion Engineers.
- a. NACE RP0188, Discontinuity (Holiday) Testing of Protective Coatings.

1.4 QUALITY ASSURANCE

A. Qualifications:

- 1. Manufacturer:

- a. Manufacturer shall have a minimum of 5 years successful experience producing the specified pipe and fittings and shall be able to show evidence of at least 5 installations in satisfactory operation in the United States that are similar applications to the specified service.
- b. Specified lining and coating products shall be manufactured by a firm with a minimum of 5 years successful experience in protecting pipelines exposed to the specified service conditions, and shall be able to show evidence of at least 5 installations in satisfactory operation in the United States that are similar applications to the specified service.
- c. When not applied by the manufacturer, lining and coating Subcontractor shall have a minimum of 5 years successful experience in the application of the specified linings and coatings for similar applications for the specified service, and shall be able to show evidence of at least 5 installations in satisfactory operation in the United States.
- d. C900/RJ PVC shall be manufactured by CertainTeed Corporation, or approved equal.

B. Supply and Compatibility:

1. All pipe of each material type shall be furnished by the same manufacturer.
2. Pipe manufacturer shall review and approve or prepare all Shop Drawings and other submittals for pipe, fittings, and appurtenances furnished under this Section.
3. Pipe, fittings, and appurtenances shall be suitable for the specified service and shall be integrated into overall piping system by pipe manufacturer.
4. Pipe manufacturer shall be responsible for all products and all factory-applied linings and coatings, whether installed at pipe manufacturer's facility or at manufacturer's Supplier's facility.

C. Regulatory Requirements:

1. Comply with requirements and recommendations of authorities having jurisdiction over the Work, including.
 - a. Kentucky Division of Water
 - b. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.
 - c. County Highway Department
2. Obtain required permits for Work in roads, rights-of-way, and other areas of the Work, unless otherwise stipulated by Owner.
3. Terms and conditions of construction as required by the Contractor's permit with the controlling agency. When conditions of the permit conflict with proposed work, the Contractor(s) shall notify the Engineer for correction prior to installation. Any non-compliant work performed by the Contractor(s) shall be at the Contractor's expense.
4. NFPA Compliance: Comply with NFPA 24 for materials, installations, tests, flushing, and valve and hydrant supervision for fire-service-main piping for fire suppression.
5. Comply with ASTM F 645 for selection, design, and installation of thermoplastic water piping.
6. Pipe and fittings, including linings and coatings, that will convey potable water or water that will be treated to become potable, shall be certified by an accredited organization in accordance with NSF 61 as being suitable for contact with potable water, and shall comply with requirements of authorities having jurisdiction at Site.

1.5 SUBMITTALS

A. Action Submittals: Submit the following with Shop Drawings per Section 01300 Submittals:

1. Shop Drawings:
 - a. Laying schedules for piping with restrained joints.
 - b. Joint restraint calculations as required by this specification.
 - c. Details of piping, fittings, gaskets, hardware, linings & coatings, valves, valve boxes, hydrant assemblies, meter assemblies, specials, joints, joint restraints, connections to existing piping, structures, equipment, and appurtenances.
2. Product Data:
 - a. Manufacturer's literature and specifications, as applicable, for products specified in this Section.
3. Product Data for C900/RJ PVC Restrained Joint Pipe:
 - a. Restrained joint PVC pipe products shall have been tested and approved by Underwriters Laboratories for continuous use at rated pressures as follows:

Pipe Size	4"	6"	8"	10"	12"
DR18	UL Listed for Underground Restrained Joint Water Mains				
DR14	UL Listed for Underground Restrained Joint Water Mains			UL Listed for Conventional Underground Water Mains Installed with Thrust Blocks	

Note: All approvals shown are for a locking-joint system suitable for directional drilling.

Copies of agency approval reports or product listings shall be provided to the Engineer.

4. Testing Procedures:
 - a. Submit proposed testing procedures, methods, apparatus, and sequencing. Obtain Engineer's approval prior to commencing testing.
- ### B. Informational Submittals: Submit the following:
1. Certificates:
 - a. Submit certificate signed by manufacturer of each product that product conforms to applicable referenced standards and the Contract Documents.
 - b. Submit certificate signed by applicator of the linings and coatings, if other than pipe manufacturer, stating that product to be applied conforms to applicable referenced standards and that the applicator shall conform to the Contract Documents.
 2. Source Quality Control Submittals:
 - a. Submit results of specified shop tests for pipe, fittings, linings, and coatings if requested by the Engineer.
 - b. Lining and coating test coupons if requested by the Engineer.
 3. Field Quality Control Submittals:
 - a. Results of each specified field quality control test.

- C. Closeout Submittals: Submit the following:
 - 1. Record Documentation:
 - a. Maintain accurate and up-to-date record documents showing modifications made in the field, in accordance with approved submittals, and other Contract modifications relative to buried piping Work. Submittal shall show actual location of all piping Work and appurtenances at same scale as the Drawings.
 - b. Show piping with elevations referenced to Project datum and dimensions from permanent structures. For each horizontal bend in piping, include dimensions to at least three permanent structures, when possible. For straight runs of piping provide offset dimensions as required to document piping location.
 - c. Include profile drawings with buried piping record documents when the Contract Documents include piping profile drawings.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Material delivery, storage and handling must conform to requirements in Contract Documents.
- B. Ship and store in accordance with manufacturer's recommendations.
- C. Inspect all materials during unloading process.
- D. Notify Owner of any cracked, flawed or otherwise defective material.
- E. Remove all materials from the Site that are found to be unsatisfactory.
- F. Handling of Pipe and Fittings Lined with Ceramic Epoxy, Fusion Bonded Epoxy, or Glass: Lifting devices shall not come into contact with lined surfaces. Use hooks, forks, chains, straps, and other lifting devices only on exterior of pipe and fittings. Pipe and fittings with damaged lining shall be replaced regardless of cause of damage.
- G. Handling of Fittings Coated with Fusion Bonded Epoxy: Hooks, forks, chains, straps, and other lifting devices shall be rubber-coated and be used only on exterior of fittings in manner to avoid damaging coating. If coating becomes damaged, notify pipe and coating manufacturer to determine if repair of damaged area or re-coating is required. Perform repairs using recommended procedures and materials provided by manufacturer, as accepted by Engineer. Pipe and fittings requiring re-coating shall be removed from Site and returned to manufacturer's facility. Repaired or re-coated pipe and fittings shall comply with requirements of this Section.

PART 2 - PRODUCTS

2.1 GENERAL:

- A. Piping systems shall be suitable for their intended use.
- B. Pipe shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions, and other defects. Unless otherwise shown or indicated, pipe shall be uniform in color, opacity, density, and other physical properties.
- C. Buried pipe shall be capable of withstanding external live load, including impact, equal to AASHTO H-20 loading, with cover shown or indicated in the Contract Documents.

- D. Joints shall be as specified in the Contract Documents. If not specified, for ductile iron pipe provide flanged joints for exposed piping and push-on or mechanical joints for buried piping. Provide couplings on pipe with plain or grooved ends where shown or where approved by Engineer.
- E. Pipe Markings:
 - 1. Manufacturer shall cast or paint on each length of pipe and each fitting pipe material, diameter, and pressure or thickness class.

2.2 DUCTILE IRON PIPE AND FITTINGS

- A. Flanged Pipe: Fabricate in accordance with AWWA C115.
 - 1. Unless otherwise noted on the Drawings, flanged joints shall be used for housed pipe applications.
 - 2. Pressure Rating: As specified in on Contract Drawings. If not otherwise specified, 3 inch to 12 inch diameter pipe shall be a minimum Pressure Class 350 in accordance with AWWA C150. Pipe with a diameter larger than 12 inch shall be a minimum Pressure Class 250 in accordance with AWWA C150.
 - 3. Ductile iron flanges for pipe and fittings are to have dimensions, facing, and drilling to correspond with Class 125 with WWP of 250 psi, unless otherwise noted on the Drawings.
 - 4. Where flanges are pit cast integrally with pipe in vertical position in dry sand molds, flanged pipe shall be latest revision of ANSI Specifications A21.2 for Class 150 or Class 250 pipe. Where flanged pipe is made up by threading plain end, centrifugally cast pipe, screwing on specially designed long hub flanges, and refacing across both face of flange and end of pipe, flange shall be per ANSI Specification B16.1 and pipe shall be ANSI Specification A21.6, Class 125. Either method of manufacture of flanged pipe will be acceptable; except when plain ends fit into mechanical joint bells, then centrifugally cast pipe shall be used.
 - 5. Restrained flanged coupling adapters shall be installed as shown on the plans. The restrained flanged coupling adapters shall be EBAA Iron "MegaFlange" Style 2100, or equal. Restrained flange coupling adapters shall be installed in strict accordance with the coupling manufacturer's recommendations. All flanged coupling adapters shall be restrained. The tie rods shall be of sufficient number and strength to restrain the coupling at the test pressure as listed in the pipe schedule and piping detail plan. Use a minimum of two (2) 5/8 in. diameter tie rods at all connections.
- B. Non-Flanged Pipe: Conform to AWWA C151 for material, pressure, dimensions, tolerances, tests, markings, and other requirements.
 - 1. Pressure Class:
 - a. 3 inch diameter through 12 inch diameter shall be a minimum Pressure Class 350 in accordance with AWWA C150.
 - b. Larger than 12 inch diameter shall be a minimum Pressure Class 250 in accordance with AWWA C150.
 - 2. Special Thickness Class: As specified in piping schedules.
- C. Each piece of pipe shall bear the manufacturer's name or trademark, the year in which it was produced and the letters "DI" or word "DUCTILE". Pipe manufacturer shall furnish notarized certificate of compliance to the above AWWA or ANSI specifications.

- D. The cleaning assembly of pipe and fitting joints shall be in accordance with the manufacturer's recommendations.
- E. Lining and Coating Ductile Iron Pipe and Fittings:
 - 1. The interior of the pipe and fittings shall be cement mortar lined with bituminous seal coat in accordance with ANSI/AWWA C104/A21.4. Thicknesses of the lining shall be set forth in the aforementioned specification unless otherwise directed by the ENGINEER.
 - 2. The exterior of all pipe, unless otherwise specified, shall receive either coal tar or asphalt base coating a minimum of one (1) mil thick, in accordance with AWWA C151, AWWA C115, AWWA C110, and AWWA C153 as applicable.
 - 3. All buried ductile iron pipe and fittings shall have manufacturer's outside coal tar or asphaltic base coating and a cement lining and bituminous seal coat on the inside.
 - 4. Housed Pipe in Buildings and Vaults: All pipe and fittings housed and in vaults shall be lined and coated on the inside as specified herein but *may* be left uncoated or provided with epoxy primer on the outside prior to field painting and coating.
 - 5. See paragraph 2.3 for special requirements for air piping.
- F. Joints for Ductile Iron Pipe and Fittings
 - 1. Flanged Joints: Conform to AWWA C110 and AWWA C111 capable of meeting the pressure rating or special thickness class, and test pressure specified in piping schedule or on Contract Drawings.
 - a. Unless otherwise noted on the Drawings, flanged joints shall be used for housed pipe applications.
 - b. Gaskets: Unless otherwise specified, gaskets shall be at least 1/8 inch thick, ring or full-face as required for the pipe, of synthetic rubber compound containing not less than 50 percent by volume nitrile or neoprene, and shall be free from factice, reclaimed rubber, and other deleterious substances. Gaskets shall be suitable for the service conditions specified, specifically designed for use with ductile iron pipe and fittings.
 - c. Bolts: Comply with ANSI B18.2.1.
 - 1) Exposed: ASTM A307, Grade B.
 - 2) Buried or Submerged: ASTM A193, Grade B8M, Class 2, Heavy hex, Type 316 stainless steel.
 - d. Nuts: Comply with ANSI B18.2.2.
 - 1) Exposed: ASTM A563, Grade A, Heavy hex.
 - 2) Buried or Submerged: ASTM A194, Grade B8M, Heavy hex, Type 316 stainless steel.
 - 2. Mechanical Joints
 - a. Unless otherwise noted on the drawings, mechanical joints or push-on joints shall be used for buried pipe applications.
 - b. Mechanical joints shall be ductile iron conforming to ANSI/AWWA C110/A21.10 and are to be furnished according to ANSI/AWWA C111/A21.11, capable of meeting pressure rating or special thickness class, and test pressure specified. All pipe joints must be furnished complete with all accessories. Ductile iron mechanical joints shall be used for ductile iron pipe. Rubber gaskets shall be made of plain first grade rubber, free of imperfections and porosity. Hardness shall be 70 to 75 durometer.
 - 1) Glands: Ductile iron.
 - 2) Gaskets: Plain tip.
 - 3) Bolts and Nuts: High strength, low alloy steel in accordance with AWWA C111. Shall be treated with Cor Blue, Blue Fluro, or approved equal.

3. Push-On Joints
 - a. Unless otherwise noted on the drawings, mechanical joints or push-on joints shall be used for buried pipe applications.
 - b. Push on joints shall comply with AWWA C111 and AWWA C151, capable of meeting pressure class or special thickness class, and test pressure specified.
 - 1) Gaskets: Vulcanized SBR, unless otherwise specified.
 - 2) Stripes: Each plain end shall be painted with a circular stripe to provide a guide for visual check that joint is properly assembled.
 - 3) Products and Manufacturers: Provide one of the following:
 - a) Tyton or Fastite Joint by Clow Water Systems, Atlantic States Cast Iron Pipe Company, Canada Pipe Company, Ltd., McWane Cast Iron Pipe Company, Pacific States Cast Iron Pipe Company, and Griffin Pipe Products Company.
 - b) Fastite Joint by American Cast Iron Pipe Company.
 - c) Tyton Joint by U.S. Pipe and Foundry Company.
 - d) Or equal.
 - c. Restrained Joints: Restrained push-on joints shall be capable of being deflected after full assembly. Field cuts of restrained pipe are not allowed without approval of Engineer.
 - 1) Products and Manufacturers: Provide restrained joints for mechanical joint piping by one of the following:
 - a) Megalug, Series 1100, by EBBA Iron Sales, Inc.
 - b) Or approved equal.
 - 2) Products and Manufacturers: Provide restrained joints for push-on joint piping by one of the following:
 - a) Super-Lock Joint Pipe, by Clow Water Systems, a division of McWane, Inc.
 - b) Lok-Ring Joint, or Flex-Ring Joint, by American Cast-Iron Pipe Company.
 - c) TR Flex Joint, by U.S. Pipe and Foundry Company.
 - d) Snap-Lok, by Griffin Pipe Products Company.
 - e) Or equal.
 4. All items used for jointing pipe shall be furnished with the pipe and tested before shipment. The joints shall be made with tools and lubricant in strict conformity with the manufacturer's instructions. If requested, three (3) copies of such instructions shall be delivered to the ENGINEER at start of construction.
- G. Flanged and Push-On Joint Fittings: Comply with AWWA C110/AWWA C153 and AWWA C111.
1. Material: Ductile iron.
 2. Pressure rating, gaskets, bolts, and nuts shall be as specified for flanged joints. Pressure rating of fittings shall meet, but not exceed, specified pressure rating or special thickness class of the connected pipe.
- H. Mechanical Joint Fittings: Comply with AWWA C110/AWWA C153 and AWWA C111.
1. Material: Ductile iron.
 - ~~2. Glands: Ductile iron.~~
 3. Pressure rating, gaskets, bolts, and nuts shall be as specified for mechanical joints. Pressure rating of fittings shall meet, but not exceed, specified pressure rating or special thickness class of connected pipe.
 4. Compact Fittings: Compact fittings may be used in lieu of standard fittings and shall conform to ANSI/AWWA C153/A21.53.

- I. Threaded Joints: Threaded joints shall have red or white lead painting on male threads. Teflon tape may be used on male threads in lieu of paint.
- J. Hot Poured Joints: Compound for cast iron bell and spigot pipe joints shall be caulking lead not less than 99.73% lead meeting AWWA Specifications for jointing water pipes. This method shall be used only when replacing an existing joint.
- K. Grooved Pipe and Fittings: Grooved pipe and fittings may be used in lieu of flanged pipe and fittings. Grooved joints shall conform to ANSI/AWWA C606 specifications. Fittings shall conform to ANSI A21.10/AWWA C-110 for dimensions and AWWA C-153 and C-110 standards for wall thickness. Couplings and fittings shall be as manufactured by Victaulic Company, or equal.
- L. Specials:
 - 1. Transition Pieces:
 - a. Provide suitable transition pieces (adapters) for connecting to existing piping.
 - b. Provide suitable transition gaskets as required for connecting to existing piping as recommended the manufacturer for the given outside diameter.
 - c. Unless otherwise shown or indicated, expose existing piping to determine material, dimensions, and other data required for transition pieces.
- M. Polyethylene Encasement (Required for Buried Ductile Iron Air Lines)
 - 1. Supply polyethylene in tubes or sheets.
 - 2. Provide polyethylene encasement for ductile iron piping to prevent contact between pipe and surrounding bedding material and backfill.
 - 3. Polyethylene encasement materials shall be in accordance with AWWA C105.
 - a. Polyethylene encasement shall be High Density Cross Laminated Polyethylene (HDCL PE) when used for air line applications.

2.3 DUCTILE IRON AIR PIPING AND FITTINGS

- A. Ductile iron piping and fittings used for blower air service lines shall be unlined and uncoated (base pipe) on the inside and bituminous coated on the outside.
- B. Gaskets for use on ductile iron pipe and fittings used for blower air service shall be Fluoroelastomer (FKM) or other approved material capable of withstanding air temperatures up to 250 degrees Fahrenheit for push joints and 225 degrees Fahrenheit for mechanical and flanged joint fittings.

2.4 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS (GRAVITY LINES)

- A. Polyvinyl chloride (PVC) pipe and fittings, 4 to 24 inch in diameter, for gravity sewers shall conform to the requirements of ASTM specification D-3034 (SDR 35), current approval, "Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings."
- B. Large (21"-48") diameter PVC pipe and fittings shall meet the requirements of ASTM F794, Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter for closed profile (CP) pipe.
- C. All pipe and fittings shall be inspected at the factory and on the job site. Testing of PVC pipe and fittings shall be accomplished in conformance with the latest revision of ASTM D3034,

ASTM D2444, ASTM D2412, and ASTM D2152. The manufacturer shall submit 5 copies of certification of test for each lot of material represented by shipment to the job site.

- D. The pipe shall be homogeneous throughout and free from cracks, holes, foreign inclusions or other defects. The pipe shall be as uniform in color as commercially practical. PVC pipe shall have a ring painted around spigot ends in such a manner as to allow field checking of setting depth of pipe in the socket.
- E. Pipe must be delivered to job site by means which will adequately support it, and not subject it to undue stresses. In particular, the load shall be so supported that the bottom rows of pipe are not damaged by crushing. Pipe shall be unloaded carefully and strung or stored as close to the final point of placement as is practical. Pipe shall not be stored outside where subject to sunlight.
- F. The PVC pipe manufacturer shall provide special fittings, acceptable to the ENGINEER to make water-tight connections to manholes.
- G. Fittings for service connections shall be of the factory made inline type conforming with the requirements of ASTM specification D-3034, current approval. Saddle type fittings shall not be used.
- H. PVC sewer pipe shall be supplied in standard lengths of at least 12'-6". Longer lengths are permitted.
- I. PVC sewer pipe shall be marked with the manufacturer's name, production lot number, ASTM designation, PVC, and the nominal diameter.
- J. Five copies of directions for handling and installing shall be furnished to the CONTRACTOR from the manufacturer at the first delivery of the pipe to the job.

2.5 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS (PRESSURE LINES)

- A. C900 PVC (Diameter \leq 12 inch):
 - 1. Pipe shall be made from Class 12454-B virgin compound as defined in ASTM D1784 and providing a hydrostatic design basis of 4000 psi for water at 73.4 degrees F in accordance with ASTM D2837, and cast iron pipe equivalent to outside diameter dimensions, and with wall thicknesses equivalent to DR 25 (165 psi) unless noted otherwise on drawings. Pipe shall meet the requirements of the latest edition of ANSI/AWWA C900.
- B. C905 PVC (Diameter > 12 inch):
 - 1. Pipe shall be made from Class 12454-B virgin compound as defined in ASTM D1784 and providing a hydrostatic design basis of 4000 psi for water at 73.4 degrees F in accordance with ASTM D2837, and cast iron pipe equivalent to outside diameter dimensions, and with wall thicknesses equivalent to DR 21 (200 psi) or higher pressure rating unless noted otherwise on drawings. Pipe shall meet the requirements of the latest edition of ANSI/AWWA C905.
- C. C900/C905 PVC/RJ:
 - 1. Pipe shall be made from Class 12454-B virgin compound as defined in ASTM D1784 and providing a hydrostatic design basis of 4000 psi for water at 73.4 degrees F in accordance with ASTM D2837, and cast iron pipe equivalent to outside diameter dimensions, and with wall thicknesses equivalent to DR 18 (Diameter \leq 12") or DR 18

(Diameter > 12") unless noted otherwise on drawings. Pipe shall meet the requirements of the latest edition of ANSI/AWWA C900/C905 and shall be designated as Certa-Lok C900/RJ or Certa-Lok C905/RJ or Engineer approved equal.

2. The pipe material to be used shall meet AWWA C900 or C905 standards for Polyvinyl Chloride pressure pipe and fittings with a dimension ratio DR18 (Diameter ≤ 12") or **DR 18** (Diameter > 12") unless noted otherwise on drawings. All other pipe shall have the written approval of the Engineer and meet all submittal review as an optional approved product. The pipe shall be designated as Certa-Lok C900/RJ™ or Certa-Lok C905/RJ™ as manufactured by CertainTeed Corporation or Engineer approved equal.

D. ASTMD2241 PVC

1. Pipe and fittings shall be made from Class 12454 virgin compound conforming to ASTM D1784 and a hydrostatic design stress of 2000 psi. Pipe shall conform to ASTM D2241 for SDR 21 as specified on the Drawings.

E. Fittings:

1. Provide ductile iron fittings per the applicable specification section.

F. Pipe Joining for PVC Pressure Pipe:

1. Joints for PVC Pressure Pipe:
 - a. Provide bell and spigot joints. Bell shall consist of an integral wall section to hold securely in place (and prevent displacement during assembly of joint) elastomeric O-ring gasket.
 - b. Jointing lubricant shall be as recommended by pipe manufacturer.
 - c. Provide elastomeric gaskets complying with ASTM F477 and ASTM D3139.
 - d. Restrained Joints: Provide restrained joints where shown or indicated.
 - 1) Comply with the applicable piping installation section.
 - 2) PVC push-on joint piping:
 - a) Ford Uni-flange Block Buster 1350
 - b) EBAA Megalug Series 1900
 - c) Or approved equal.
 - 3) PVC Pipe to Mechanical Joint
 - a) EBAA Megalug Series 2000PV
 - b) Or approved equal.
 - e. Joints of C900 PVC / RJ specified in following paragraph

G. Pipe Joining for C900/RJ PVC Pressure Pipe

1. C900 PVC / RJ Polyvinyl Chloride (PVC) Pipe Joints:
 - a. The pipe shall be joined using a separate PVC coupling with beveled edges, built-in sealing gaskets and restraining grooves. The restraining splines shall be square or rectangular, and made from Nylon 101.
 - b. Exposed splines shall be cut flush to coupling to reduce soil drag.
 - c. Couplings shall be beveled on leading edges to minimize soil friction.
 - d. Contractor shall adhere to the pipe manufacturer's most current calculations regarding tensile load limitations for trenchless application.

H. Pipe Joining for PVC Gravity Pipe

1. Polyvinyl Chloride (PVC) Pipe Joints: Jointing of PVC pipe shall be of the elastomeric gasket type inserted in the belled end of the pipe or double hub joints, mechanical joint, or as specified. Ring shall be corrosion resistant for specific service of piping. Solvent weld joints are not acceptable.

2. Joints for PVC pipe shall be installed per the manufacturer's recommendations. Pipe that has been field cut must be beveled for insertion into gasketed joints. Bevel can be made with hand or power tool. In either case, the finished bevel should be the same as the factory bevel. All pipe shall be provided with home marks to insure proper gasket seating. Gasket material shall comply with the physical requirements specified in ASTM D-1869, C-361, C-433, current approval.

I. Identification:

1. Pipe shall be marked as follows: Nominal pipe size PVC ; Dimension Ratio, Standard Dimension Ratio; AWWA pressure class; Extrusion production record code; Trademark or trade name; Cell Classification 12454 may also be included.

J. Source Quality Control:

1. Shop Tests:
 - a. Pipe manufacturer shall maintain continuous quality control program.
 - b. Where applicable and when requested by Engineer, submit results of source quality control tests specified in reference standards.
 - c. CPVC plastic molding materials used for manufacturing pipe and fittings under this Section shall be tested for compliance with ASTM D1784.

2.6 WALL SLEEVES:

- A. See Section 15065.

2.7 REINFORCED CONCRETE PIPE

- A. Except as otherwise specified herein, pipe shall conform to ASTM Standard Specifications for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe, Designation C 76-90, of the Class shown on the Drawings in the Pipe Schedule. The tabulated reinforcement given in the tables shall be the minimum required. The pipe interior shall be smooth and even, free from roughness, projections, indentations, offsets, or irregularities of any kind. The concrete mass shall be dense and uniform. The supplier is responsible for the performance of all inspection requirements as specified in ASTM C76-90. A complete set of records of the tests shall be submitted.
- B. Non-air-entraining portland cement conforming to ASTM Specification C 150-81, Type II shall be used, except as otherwise approved in writing to the ENGINEER. The use of a non-bleeding, water-reducing, dispersing agent may be permitted subject to the specific approval of the ENGINEER. The use of any other admixture will not be permitted.
- C. Fine aggregate shall consist of washed inert natural sand conforming to the requirements of ASTM Specification C 33, latest edition, except for gradation, with a maximum loss of 7.5 percent when subjected to five (5) cycles of the soundness test using magnesium sulfate. Coarse aggregate shall consist of well-graded crushed stone or washed gravel conforming to the requirements of ASTM Specification C 33, latest revision, except for gradation, with a maximum loss of 7.5 percent when subjected to five (5) cycles of the soundness test using magnesium sulfate.
- D. The 28-day compressive strength of the concrete shall be not less than 4,000 psi and shall meet testing requirements as specified in Section 11 of ASTM C76-90. The concrete mass shall be dense and uniform. The average absorption shall not exceed 5.0 percent of the dry weight and no specimen shall exceed 5.3 percent of the dry weight. Reinforcement shall be circular for all

concrete pipe. Reinforcement in the bell and spigot shall be adequate to prevent damage to concrete during shipping, handling and installation. Cores indicating reinforcing steel having less than 85 percent bond shall be cause for rejection of the lot of pipes.

E. Pipe may be rejected for any of the following reasons:

1. Excessive exposure of any wires and positioning spacers or chairs used to hold the reinforcement case in position, or steel reinforcement in any surface of the pipe, except for ends of longitudinal reinforcing.
2. Transverse reinforcing steel found to be in excess of 1/4 inch out of specified position after the pipe is molded.
3. Any shattering or flaking of concrete at a crack.
4. Air bubble voids (bug-holes) on the interior and exterior surfaces of the pipe exceeding 1/4 inch in depth unless properly and soundly pointed with mortar or other approved material.
5. Unauthorized application of any wash coat of cement or grout.
6. A deficiency greater than 1/4 inch from the specified wall thickness.
7. A variation from the specified internal diameter in excess of one (1) percent or interior surfaces which have been reworked after placing of concrete. The variation in internal diameter permitted herein does not apply to gasket contact surface in gasketed joint pipe.
8. A hollow spot (identified by tapping the internal surface of the pipe) which is greater than 30 inches in length or wider than three (3) times the specified wall thickness. Repair of such defective areas not exceeding these limitations may be made.
9. Defects that indicate imperfect molding of concrete; or any surface defect indicating honeycomb or open texture (rock pockets) greater in size than area equal to a square with a side dimension of 2-1/2 times the wall thickness or deeper than two times the maximum graded aggregate size; or local deficiency of cement resulting in loosely bonded concrete, the area of which exceeds in size the limits of area described in paragraph 8 above when the defective concrete is removed. Repair of such defects not exceeding these limits may be made as provided in paragraph 8 above.
10. Any of the following cracks:
 - a. A crack having a width of 0.005 inch to 0.01 inch throughout a continuous length of 36 inches or more.
 - b. A crack having a width of 0.01 inch to 0.03 inch or more throughout a continuous length of one (1) foot or more.
 - c. A crack greater than 0.005 inch extending through the wall of the pipe and having a length in excess of the wall thickness.
 - d. Any crack showing two visible lines of separation for a continuous length of 2 feet or more, or an interrupted length of three (3) feet or more anywhere in evidence, both inside and outside.
 - e. Cracks anywhere greater than 0.03 inch in width.

F. The pipe shall be clearly marked as required by ASTM C76-90. The markings may be at either end of the pipe for the convenience of the manufacturer, but for any one size shall always be at the same end of each pipe length. Pipe shall not be shipped until the compressive strength of the concrete has attained 4,000 psi and/or the pipe has demonstrated sufficient strength through Three-Edge-Bearing (D-load) test.

G. Pipe shall have minimum laying length of approximately 8 feet except for closure and other special pieces. The CONTRACTOR(S) shall have available at the site of the work sufficient pipe for various lengths to affect closure at manholes or structures that cannot be located to

accommodate standard lengths. Short lengths of pipe made for closure, etc., may be used in the pipeline at the end of construction if properly spaced. The length of the incoming and outgoing concrete pipe at each structure shall not exceed four (4) feet, except where the joint is cast flush with the exterior wall of the structure. Maximum laying length shall not exceed 16 feet, but the installation of 16 foot lengths will depend upon the ability of the CONTRACTOR(S) to handle such lengths of pipe in deep sheeted trenches, comply with trench width requirements, maintain the integrity of the sheeting and avoid disturbance to adjacent ground. If in the opinion of the ENGINEER the use of 16 foot lengths is impracticable, shorter lengths shall be used.

H. Fittings and Bends

1. The manufacturer shall submit the proposed method of fabrication of bends and special pieces to the ENGINEER for approval. All such fittings shall conform to all applicable requirements of this Specification.
2. Pipe for use on curved sections shall be fabricated by beveling one or both ends sufficient to produce the radius of curvature required. Joint deflection shall not be utilized to produce the radius of curvature required. Reinforced concrete bends shall be cast to the degree of curvature required or fabricated by cutting the pipe at the required angle and then rejoining the sections.
3. Steel wall fittings to be used in the walls of the cast-in-place structures shall be equal to those manufactured by Price Brothers Company and shall be compatible with rubber and steel joints of reinforced concrete pipe and pre-stressed concrete cylinder pipe where applicable.

I. Joints for Concrete Pipe

1. Pipe joints shall be of the rubber gasket type in which the gaskets are in compression and which will permit both longitudinal and angular movement. Each unit of pipe shall be provided with proper ends made of concrete formed true to size and formed on machined rings to ensure accurate joint surface. Joints and gaskets shall conform to the requirements of ASTM Standard specifications for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets, Designation C443-94, or ASTM Standard Specifications for Reinforced Concrete Low-Head Pressure Pipe, Designation C361-92 and to the additional requirements specified.
2. Gaskets shall be of a composition and texture which is resistant to common ingredients of sewage, industrial wastes, and groundwater, and which will endure permanently under the conditions likely to be imposed by this service. Gaskets shall be the product of a manufacturer having at least five years' experience in the manufacture of the rubber gaskets for the pipe joints.
3. The gaskets shall be designed and manufactured so that the completed joint will withstand an internal water pressure in excess of 10 psi for a period of 10 minutes without showing any leakage by the gasket or displacement of it, see ASTM C 443-79. The pipe manufacturer shall provide facilities for testing the effectiveness of the joints against leakage and one such test may be required for each 500 feet of pipe for each type of joint manufactured. Such tests shall be made by an internal or external pressure against the joint of at least 10 psi for a period of 10 minutes.

J. Coating and Lining for Concrete Sewer Pipe

1. General: The concrete pipe used for process lines and gravity sewers shall be unlined unless noted on the Drawings. If lining is required it shall be lined at the manufacturer's plant with a high build, 2-component polyamine cured epoxy system and the spigot ends coated to give full protection to the area exposed in the bell of the joint. Instructions for coating and lining the concrete pipe shall apply to the total interior of the pipe and the exterior of the spigot end.

2. The pipe manufacturer shall submit complete information on the proposed system, method of application and name of applicator to the ENGINEER and shall have received the ENGINEER'S review and comments before undertaking any pipe coating or lining.
3. Material: The compound shall conform to Corps of Engineers Paint Specification C2200 with modifications as required for application to concrete sanitary sewer pipe, for application with a high speed centrifugal airless device in a multi-passed operation to produce the total required film thickness.
4. Surface Preparation: All interior and exterior surface areas, including pipe jointing areas, shall be prepared for coating so as to remove all laitance form oil and other loose, foreign or deleterious materials which would adversely affect the bond of the lining compound to the pipe surface. Specifically, surface preparation shall consist of sandblasting and cleaning the barrel of the pipe and the joint surface areas on which the coatings will be applied.
5. After blasting and cleaning, all barrel surfaces shall be inspected, and if such inspection reveals open holes, such holes shall be sealed in strict accordance with the coating manufacturer's written instructions. In all cases, the coating manufacturer's surface preparation requirements shall prevail and, if any questions arise, written instructions shall be solicited from the coating manufacturer and strictly followed.
6. Atmospheric and Substrate Conditions: The pipe surface areas to be lined and coated shall be blown off with air to remove all sand, dust and other loose materials immediately prior application of the lining compound. The compound must be applied on completely frost-free pipe surface and shall not be applied when the ambient temperature is below 50 degrees Fahrenheit nor unless it can be unreasonably anticipated that the average ambient temperature will be 50 degrees Fahrenheit or higher during the 5-day period subsequent to the application of any coat.
7. Equipment: All application equipment shall be as recommended by the supplier of the compound. The preferred method of application for the pipe barrel is by means of a high speed centrifugal airless device equipped to apply the material at a controlled rate and speed with multi-pass application along the longitudinal axis of the pipe to build up the coating to the prescribed thickness without localized buildup, lumping or sagging. Where such equipment is not available or is not recommended by the coating manufacturer, consideration may be given to application by manual brush or spray using not less than two successive coats with varying patterns to avoid ridges and holidays. Spray equipment or brush shall be utilized to coat the joint surfaces. Exterior surfaces may be sprayed or coated by brush.
8. Application: The compound shall be applied to the barrel of the pipe utilizing the equipment specified so as to obtain a continuous and relatively uniform and smooth integral lining and coating.
9. The total dry film thickness shall be a minimum of 20 mils. The manufacturer shall furnish complete instructions as to build per coat, thinning and minimum as well as maximum drying time between coats, and such instructions shall be strictly followed by the applicator.
10. The coating shall be applied to all interior surfaces of the pipe including the bell, and shall extend around the end and on the outside of the spigot end. Dry film thickness on the mating surface of the joints may be reduced if required to maintain joint tolerance.
11. Applicator: In order to avoid controversy in the event of unsatisfactory results, the applicator must be furnished by or approved by the coating manufacturer. The applicator must have a proven experience record of at least 3 years in the application of such coatings to concrete pipe, and must be acceptable to the Engineer.

12. Supervision and Control: Where the application is not performed by the coating manufacturer, the manufacturer shall provide technical assistance as required to insure proper procedures and results.
13. The applicator shall regularly and routinely check the material temperature, moisture content of the pipe sections and wet film thickness of the coated pipe. He shall also make available for use a holiday detector equal to Tinker & Rason Model M33DC and shall check each coated pipe section for holidays.
14. Inspection: The pipe shall be inspected and labeled by the independent testing laboratory provided by the OWNER. The independent testing laboratory provided by the OWNER will make random selections of up to 1 percent of the coated pipe sections which will be visually inspected, checked for holidays and tested for dry film thickness. Any patching or recoating of the test sections shall be done by the applicator at no additional cost. Any changes in procedure or any recoating necessary to correct defective coating systems shall be carried out promptly upon notification of such deficiencies.
15. Repair of Coating: Any coating areas damaged in shipping, handling or installing shall be repaired in accordance with material furnished by and in accordance with instructions of the coating manufacturer.

2.8 VITRIFIED CLAY PIPE

- A. All vitrified clay pipe shall be manufactured in accordance with ASTM Specification C700 (latest revision) Extra Strength pipe. Approved manufacturer is Can Clay Corporation, or equal.
- B. All pipe shall be furnished with flexible compression joints conforming in all respects to ASTM Specification C425, latest revised edition.
- C. The polyester resin castings in the bell and on the spigot shall be factory applied. An "O" ring gasket shall be provided to fit in the groove on the spigot end which will form a flexible compression joint when assembled.
- D. When installed in accordance with ASTM C12 (latest revision), pipe shall be tested for leakage according to ASTM C828 (latest revision)

2.9 COPPER PIPE AND FITTINGS

- A. Exterior copper pipe shall be Type K pipe (ASTM B88449), with compression fittings. Joints shall be drawn up firmly and shall be tested before backfilling and any leakage stopped.
- B. Wherever copper pipes pass through walls or floors, they shall have wrought or cast iron sleeves, for easy removal. Pipes passing through structural beams shall be placed as near as possible to the top of the beam under the floor slab.

2.10 STAINLESS STEEL PIPE

- A. Pipe and Fittings
 1. Pipe shall be manufactured from ASTM-A240 annealed and pickled sheets and plates in accordance with ASTM A778 in type 304L stainless steel. Pipe shall be manufactured to nominal pipe sizes as listed in ANSI B36.19, Table 2, and shall have the following nominal wall thicknesses.

Nominal Pipe Size (IN)	Actual O.D. (IN)	Schedule/Gauge/Plate	Nom. Wall Thickness (IN)
3	3.500	Sch. 5s	0.083"
4	4.500	Sch.5s	0.083"
6	6.625	Sch.5s	0.109"
8	8.625	Sch.5s	0.109"
10	10.750	12 Ga Sheet	0.109"
12	12.750	12 Ga Sheet	0.109"
14	14.000	11 Ga Sheet	0.125"
16	16.000	11 Ga Sheet	0.125"
18	18.000	11 Ga Sheet	0.125"
20	20.000	10 Ga Sheet	0.140"
24	24.000	3/16" Plate	0.188"
30	30.000	3/16" Plate	0.188"
36	36.000	3/16" Plate	0.188"
42	42.000	1/411 Plate	0.250"
48	48.000	1/4" Plate	0.250"
54	54.000	511611 Plate	0.312"
60	60.000	5/16" Plate	0.312"

2. Fittings shall be butt weld type manufactured in accordance with ASTM-A-774 of the same raw material and in the same thicknesses as the pipe. Long radius elbows up to 2411 diameter shall be smooth flow; i.e. centerline to end of elbow equals 1.5 times the nominal pipe size. All short radius, special radius, and reducing elbows shall be of mitered construction with at least (5) miter sections for 90 degree bends, (3) mitered sections for 45 and 60 degree bends, and (2) mitered sections for 30 degree and smaller bends. Reducers shall be straight tapered, cone type. Tees, crosses, laterals and wyes shall be shop fabricated from pipe.

B. Flanges

1. Flanged pipe ends shall be made up of type 304L stainless steel slip-on type rolled angle face rings and hot-dipped galvanized ductile iron back-up flanges drilled to ANSI 16.1 class 125 standard. The angle face ring thickness shall be equal to or greater than the wall of the pipe or fitting to which it is welded and it shall be continuously welded on both sides to the pipe or fitting. The angle leg shall not interfere with the flange bolt holes. The back-up flanges shall be supplied with the following nominal thicknesses.

Nominal Pipe Size (IN.)	Flange Thickness (IN.)
2-1/2-3	1/2
4	9/16
6- 10	5/8
12- 16	3/4
18-20	7/8
24-30	1
36	1-1/8
42	1-1/4
48	1-3/8
54	1-3/8
60	1-11/2

C. Couplings

1. The piping will be shop prepared for pipe couplings where shown on the Drawings or specified herein.
 - a. Sleeve type couplings shall be of standard steel construction (with gaskets and coatings designed for 250 F service). Pipe shall be plain end with external weld beads ground smooth to insure proper gasket seating. For pressure pipe lines, sleeve coupling joints will be restrained by the use of harness rods connecting across the joint to flange lugs on adjacent flange joints. Where no adjacent flange joints exist, stainless steel harness lugs shall be welded to the pipe to receive the harness rods. All sleeve couplings, flange lugs, harness rods and hardware will be provided by the CONTRACTOR(S).
 - b. Arched band type couplings shall be stainless steel of equal or superior alloy and wall thickness as the pipe and will be Depend-O-Lok type as manufactured by Brico or equal. Couplings will be Fixed - FxF, Expansion - ExE, or Fixed by Expansion - FxE as noted on the Drawings or as required. The pipe shall be plain end with external weld beads ground smooth and with S.S. restraining rings shop welded to the piping for fixed type couplings.
 - c. Split type couplings shall be malleable iron or ductile iron. Gaskets shall be suitable for the service conditions. The pipe ends shall be roll grooved to the coupling manufacturers specifications. Where roll grooving is impractical, the pipe shall have heavy wall machine grooved pipe nipples or machined ring collars fully welded to the pipe or fitting. Nipples shall be taper bored to the I.D. of the adjoining pipe to allow full weld penetration. Collars shall be welded on both sides to the piping. Nipples and collars shall be of the same alloy as the piping.
 - d. Expansion Joints:
 - 1) Sliding expansion joints, where shown on the plans, shall be as manufactured by Dresser "Style 63", Smith-Blair, or equal.
 - 2) Flexible connectors and expansion joints shall be rubber arch joints as manufactured by Garlock, General Rubber, Goodall, Mercer, or equal. Joints shall allow a minimum of 0.625 inch pipe expansion (Goint compression), 0.25 inch pipe compression (Goint compression). Flexible connectors and expansion joints for air piping shall be suitable for 250°F service. Flexible connectors for water, wastewater and sludge service only shall be constructed with a filled arch to eliminate sedimentation of solids in the arched area.
 - a) Tie rods shall be provided at all flexible connectors and expansion joints. These tie rods shall be of sufficient number and strength to restrain the connection at test pressure as listed in the Pipe Schedule and Piping Detail Plan. Use a minimum of two (2) 5/8 inch diameter tie rods at all connections.
 - b) The flexible connectors and expansion joints shall be adequately supported. Vertical supports shall be located within three (3) pipe diameters of the connection and shall be provided on each side of the connection.

D. Threaded Connections

1. Threaded pipe, gauge or instrument connections shall be made using stainless steel 150-pound threaded half couplings conforming to ASTM-A182 or ASTM-A-276, shop welded to the pipe at the locations shown on the drawings.

E. Joints

1. Flanges shall be provided as a minimum at all flanged valves, meters, couplings, and other equipment. Couplings will be provided as shown on the Drawings.
2. Pipe and fittings spools shall be shop fabricated to the fullest extent possible in 40,011 maximum lengths with 71,611 maximum widths for efficient commercial transport to the

project site. Spools with fittings may exceed 40,011 so long as length allows commercial transport. Smaller pipe spools shall be provided with joints as shown on the drawings for special handling, installation, and/or disassembly requirements.

3. All other joints required for shipping, handling and installation of the piping spools shall be flange joints.

F. Factory Fabrication

1. All stainless steel pipe and fittings shall be pickled by immersion in an air agitated tank containing an ambient 25% solution of nitric and hydrofluoric acids for 40 to 50 minutes. A clean water rinse shall follow the acid pickle.
2. Welding shall be performed by qualified welders in conformance with standard procedures. Piping with wall thickness up to 11 gauge (0.12511) shall be welded with the TIG (GTAW) process. Heavier walls shall be properly beveled and have a root pass with the TIG (GTAW) process followed by subsequent passes with the TIG (GTAW), MIG (GMAW), or Metallic Arc (SMAW) process. Filler wire of ELC grades only shall be added to all welds to provide a cross section at the weld equal to or greater than the parent metal. Weld deposit shall be smooth and evenly distributed and have a crown of no more than 1/16 inch on the I.D. and 3/32 inch on the O.D. of the piping. Concavity, undercut, cracks or crevices shall not be allowed. Butt welds shall have full penetration to the interior surface, and inert gas shielding shall be provided to the interior and exterior of the joint. Excessive weld deposits, slag, spatter, and projections shall be removed by grinding. Angle face rings shall be continuously welded on both sides to the pipe or fitting. Welds on gasket surfaces shall be ground smooth.
3. Spools shall be fabricated to the "Pipe Fabrication Institute" fabricating tolerances ES-3 (1981).
4. After welding, all welded joints shall be treated with a pickling solution, brushed with stainless wire brushes and rinsed clean.
5. The piping supplier during manufacturing, fabrication and handling stages, and the CONTRACTOR(S) during handling and installation stages, shall use extreme care to avoid the contact of any ferrous materials with the stainless steel piping. All saws, drills, files, wire brushes, etc., shall be used for stainless steel piping only pipe storage and fabrication racks shall be non-ferrous or stainless steel or rubber lined. Nylon slings or straps shall be used for handling stainless steel piping. Contact with ferrous items may cause rusting of iron particles embedded in the piping walls. After installation, the CONTRACTOR(S) shall wash and rinse all foreign matter from the piping surface. If rusting of embedded iron occurs, the CONTRACTOR(S) shall pickle the affected surface with Oakite Deoxidizer SS or equal, scrub with stainless steel brushes and rinse clean.

2.11 HIGH DENSITY POLYETHYLENE PIPE AND FITTINGS

A. Pipe:

1. High density polyethylene pipe and fittings where shown to be used shall be nominal Ductile Iron Pipe Size (DIPS) unless otherwise noted.
2. Pipe shall be manufactured from a PE 3408 resin listed with the Plastic Pipe Institute (PPI) as TR-4. The resin material will meet the specifications of ASTM D3350-99 with a cell classification of PE345464C. Pipe shall have a manufacturing standard of ASTM F714. HDPE force main pipe shall be DR 9 (200 psi WPR) or thicker. All other HDPE pipe shall be no thinner than DR 11 (160 psi WPR). The pipe shall contain no recycled compounds except that generated in the manufacturer's own plant from resin of the same specification from the same raw material.

B. Fittings:

1. Butt Fusion Fittings - Fittings shall be PE3408 HDPE, Cell Classification of 345464C as determined by ASTM D3350-99. Butt Fusion Fittings shall have a manufacturing standard of ASTM D3261. Molded & fabricated fittings shall have the same pressure rating as the pipe unless otherwise specified on the plans. Fabricated fittings are to be manufactured using a Data Logger. Temperature, fusion pressure and a graphic representation of the fusion cycle shall be part of the quality control records.
2. Electrofusion Fittings - Fittings shall be PE3408 HDPE, Cell Classification of 345464C as determined by ASTM D3350-99. Electrofusion Fittings shall have a manufacturing standard of ASTM F-1055. Fittings shall have the same pressure rating as the pipe unless otherwise specified on the plans.
3. Flanged and Mechanical Joint Adapters - Flanged and Mechanical Joint Adapters shall be PE 3408 HDPE, Cell Classification of 345464C as determined by ASTM D-3350. Flanged and Mechanical Joint Adapters shall have a manufacturing standard of ASTM D-3261. Fittings shall have the same pressure rating as the pipe unless otherwise specified on the plans.
4. All HDPE pipe penetrations into or through new or existing structures shall be positively restrained by means of a waterstop/thrust-isolator or wall-pipe/anchor ring. Such fittings shall be provided in the same nominal size and Dimension Ratio (DR) of the pipeline and must meet AWWA C906 fitting requirements. Where applicable, HDPE pipe may terminate at a ductile iron wall pipe or other suitable fitting and be anchored with HDPE fusion-weld mechanical joint or flanged adapter fitting.
5. Taps for water service lines shall be made with tapping saddles designed for use with potable water services. They shall be constructed of heavy gauge 304 stainless steel and Nitrile Butadiene Rubber (NBR) gaskets. The assembly shall be rated for 350 psi working pressure and conform with the requirements of ANSI/AWWA C800 - Underground Service Line Valves and Fittings.

2.12 BURIED PIPING IDENTIFICATION

A. Tracing Wire Requirements

1. Insulated #10 AWG solid copper tracing wire shall be required on all buried pipes and installed on top of the pipe.
2. Use plastic "zip" strapping or metal wire to attach the tracing wire to the pipe, fittings, valves, hydrants, etc. The wire shall extend to the top of each valve box and hydrant.
3. Connect any break in the conductor line before construction with an electrical clamp, or solder, and coat the connection with a rubber or plastic insulator to maintain the integrity of the connection from corrosion. Clamp connections must be made of brass or copper and of the butt end type with wires secured by compression. Soldered connections must be made by tight spiral winding of each wire around the other with a finished length minimum of 3 inches overlap.
4. The Contractor(s) shall be responsible to test conductors for continuity/placement.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Inspect pipe materials for defects in material and workmanship. Verify compatibility of pipe and fittings. 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. 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. Pipe should be loaded, off-loaded, and otherwise handled in accordance with the applicable AWWA manuals, and all of the pipe supplier's guidelines shall be followed.
- B. 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.
- C. During removal and handling, be sure that the pipe does not strike anything. Significant impact could cause damage, particularly during cold weather.
- D. 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.

3.2 YARD PIPING INSTALLATION- GENERAL

- A. Install piping as shown, specified, and as recommended by pipe and fittings manufacturer.
- B. In the event of a conflict between manufacturer's recommendations and the Contract Documents, request interpretation from Engineer before proceeding.
- C. Engineer will observe excavations and prior to Contractor(s) laying pipe. Notify Engineer in advance of excavating, bedding, pipe laying, and backfilling operations.
- D. Earthwork is specified in Section 02220 Earthwork.
- E. Excavation for Pipeline Trenches: Trenches in which pipes are to be laid shall be excavated to the depths shown on the Drawings or as specified by the ENGINEER.
- F. Minimum cover over buried water and force main piping shall be 5 feet, unless otherwise shown or approved by Engineer.
- G. Comply with NFPA 24 for "Outside Protection", where applicable to water piping systems used for fire protection.
- H. Contractor(s) shall be responsible for verification of pipe loading during construction. Pipe design is based on final installation depth and required cover.
- I. Jointing: The types of joints described hereinbefore shall be made in accordance with the manufacturer's recommendations.

- J. Before final acceptance, the CONTRACTOR(S) will be required to level off all trenches or to bring the trench up to grade. The CONTRACTOR(S) shall also remove from roadways, rights-of-way and/or private property all excess earth or other materials resulting from construction.
- K. Where shown on the Drawings, the CONTRACTOR(S) shall install encasement pipe by the boring method. Two methods of boring will be permitted. In the first, the encasement pipe is pushed or jacked into the hole as the auger cuts out the material. The second method consists of drilling the hole completely through the fill and pushing or jacking the encasement pipe into the hole after the auger has completed the bore. The pipe shall be installed in a manner that will not disrupt traffic.
- L. Fittings shall be restrained to prevent water pressure from springing pipe sideward or upward.
- M. Pipes shall be free of all structures other than those planned. Openings and joints to concrete walls shall be constructed as shown on the Drawings.
- N. Pipes entering structures shall have flexible joint within 24 inches of exterior of structure. **Mechanical joint wall castings satisfy this requirement.**
- O. In wet, yielding and mucky locations where pipe is in danger of sinking below grade or floating out of grade or line, or where backfill materials are of such a fluid nature that such movements of pipe might take place during the placing of the backfill, the pipe must be weighted or secured permanently in place by such means as will prove effective.
- P. Where an unstable (i.e., water, mud, etc.) trench bottom is encountered, stabilization of the trench bottom is required. This is to be accomplished by undercutting the trench depth and replacing to grade with a foundation of crushed stone aggregate. The depth of the foundation is dependent upon the severity of the trench bottom. The size of stone aggregate used in the foundation will be determined by the condition of the unstable material. Once the trench bottom has been stabilized, the required bedding material can be placed. No compensation for Crushed Stone for Pipe Foundation will be made if the instability of the trench bottom is caused by the CONTRACTOR'S neglect.
- Q. Plugs (Bulkheads):
 - 1. Temporarily plug installed pipe at end of each day of Work or other interruption of pipe installation to prevent entry of animals, liquids, persons, and deleterious materials into pipe.
 - 2. Install standard plugs in bells at dead ends, tees, and crosses. Cap spigot and plain ends.
 - 3. Fully secure and block plugs, caps, and bulkheads installed for testing to withstand specified test pressure.
 - 4. Where plugging is required for phasing of the Work, abandonment of existing utilities, or subsequent connection of piping, install watertight, permanent type plugs, caps, or bulkhead acceptable to Engineer.

3.3 INSTALLATION OF PVC/RJ C900™ PIPE

- A. The Contractor(s) shall provide all material, equipment, and facilities required for directional drilling. Proper alignment and elevation of the bore hole shall be consistently maintained throughout the directional drilling operation. The method used to complete the directional drill shall conform to the requirements of all applicable permits. All permits will be obtained by the contractor copies of permits supplied to the municipality.

- B. The entire drill path shall be accurately surveyed with entry and exit stakes placed in the appropriate locations within the areas indicated on drawings. If Contractor(s) is using a magnetic guidance system, drill path will be surveyed for any surface geo-magnetic variations or anomalies.
- C. Contractor(s) shall place silt fence between all drilling operations and any drainage, well-fields, wetland, waterway or other area designated for such protection necessary by documents, state, federal and local regulations. Additional environmental protection necessary to contain any hydraulic or drilling fluid spills shall be put in place, including berms, liners, turbidity curtains and other measures. Contractor(s) shall adhere to all applicable environmental regulations.
- D. Readings shall be recorded after advancement of each successive drill pipe (no more than 20') and the readings plotted on a scaled drawing of 1"= 2', both vertical and horizontal. Access to all recorded readings and plan and profile information shall be made available to the Engineer, or his representative, at all times. At no time shall the deflection radius of the drill pipe exceed the deflection limits of the carrier pipe as specified herein.
- E. A complete list of all drilling fluid additives and mixtures to be used in the directional operation will be submitted to the Engineer, along with their respective Material Safety Data Sheets. All drilling fluids and loose cuttings shall be contained in pits or holding tanks for recycling or disposal, no fluids shall be allowed to enter any unapproved areas or natural waterways. Upon completion of the directional drill project, the drilling mud and cuttings shall be disposed of by the Contractor(s) at an approved dump site.
- F. In the event that pilot does deviate from the specified bore path, Contractor(s) shall notify Engineer and Engineer may require contractor to pull-back and re-drill from the location along bore path before the deviation. In the event that a drilling fluid fracture, inadvertent returns or returns loss occurs during pilot hole drilling operations, contractor shall cease drilling, wait at least 30 minutes, inject a quantity of drilling fluid with a viscosity exceeding 120 seconds as measured by a Marsh funnel and wait another 30 minutes. If mud fracture or returns loss continues, contractor will discuss additional options with the engineer and work will then proceed accordingly.
- G. Upon completion of pilot hole phase of the operation, a complete set of "as-built" records shall be submitted in duplicate to the municipality. These records shall include copies of the plan and profile drawing, as well as directional survey reports as recorded during the drilling operation.
- H. Upon approval of the pilot hole location, the hole opening or enlarging phase of the installation shall begin. The bore hole diameter shall be increased to accommodate the pullback operation of the required size of PVC pipe. The type of hole opener or back reamer to be utilized in this phase shall be determined by the types of subsurface soil conditions that have been encountered during the pilot hole drilling operation. The reamer type shall be at the contractor's discretion with the final hole opening being a maximum of 1.5 times larger than the outside diameter of the C900-Restrained Joint coupling to be installed in the bore hole.
- I. The open bore hole may be stabilized by means of bentonite drilling slurry pumped through the inside diameter of the drill rod and through openings in the reamer. The drilling slurry must be in a homogenous / flowable state serving as an agent to carry the loose cuttings to the surface through the annulus of the borehole. The volume of bentonite mud required for each pullback shall be calculated based on soil conditions, largest diameter of the pipe couplings, capacity of the bentonite mud pump, and the speed of pullback as recommended by the bentonite drilling fluid manufacture. The bentonite slurry is to be contained at the exit or entry side of the directional bore in pits or holding tanks. The slurry may be recycled at this time for reuse in the hole opening operation, or shall be hauled by the contractor(s) to an approved dumpsite for proper disposal.

- J. The PVC pipe shall be joined together according to manufacturer's specifications. The gaskets and the ends of pipe must be inspected and cleaned with a wet cloth prior to each joint assembly so they are free of any dirt or sand. The ends of pipe must be free of any chips, scratches, or scrapes before pipe is assembled. A pulling eye will be attached to the C900/RJTM pulling head on the lead stick of pipe which in turn will be attached to a swivel on the end of the drill pipe. Tracer wire shall be attached to the pulling eye and the crown of PVC pipe with a minimum of two full wraps of duct tape around the pipe. This will allow for a straight, smooth pull of the product pipe as it enters and passes through the borehole toward the drill rig and original entrance hole of the directional bore. The product pipe will be elevated to the approximate angle of entry and supported by means of a side boom with roller arm, or similar equipment, to allow for the free stress situation as the pipe is pulled into the exit.

3.4 PIPE BEDDING:

- A. Bed pipe as specified and in accordance with details on the Drawings and the requirements in Section 02220, Earthwork.
 - 1. Trench excavation and backfill, and bedding materials shall conform to the Contract Documents.
 - 2. Where pipe is installed in rock excavation, provide minimum of four inches of granular bedding material underneath pipe smaller than four-inch nominal diameter, and minimum of six inches of granular bedding material underneath pipes four-inch nominal diameter and larger.
 - 3. Excavate trenches below bottom of pipe by amount shown and indicated in the Contract Documents. Remove loose and unsuitable material from bottom of trench.
 - 4. Carefully and thoroughly compact pipe bedding with hand held pneumatic compactors.
 - 5. Bedding to be shaped to provide continuous bearing support to pipe for full length. Bedding to be shaped to receive bell and maintain bearing support on remainder of pipe.
 - 6. Do not lay pipe until Engineer approves bedding condition.
 - 7. Do not bring pipe into position until preceding length of pipe has been bedded and secured in its final position.

3.5 PIPE LAYING

- A. Conform to manufacturer's instructions and requirements. Additional, conform to standards and manuals listed below, as applicable:
 - 1. Ductile Iron Pipe: ANSI/AWWA C600, ANSI/AWWA C105, AWWA M41.
 - 2. Thermoplastic Pipe: ASTM D2321, ASTM D2774, ANSI/AWWA C605, AWWA M23, AWWA M45, AWWA, M55.
 - 3. Sanitary and Storm Sewers: ASCE 37.
- B. Install pipe accurately to line and grade shown and indicated in the Contract Documents, unless otherwise approved by Engineer. Remove and reinstall pipes that are not installed correctly.
- C. Verify locations and elevations of existing utilities prior to construction. Notify Engineer of any conflicts and adjust line and grade at no added cost to the Owner. Obtain approval of the Engineer prior to making such adjustments.
 - 1. Locate high points in pipeline at services and hydrants.

2. Slope piping uniformly between elevations shown.
- D. Start laying pipe at lowest point and proceed towards higher elevations, unless otherwise approved by Engineer.
 - E. Place bell and spigot-type pipe so that bells face the direction of laying, unless otherwise approved by Engineer.
 - F. Excavate around joints in bedding and lay pipe so that pipe barrel bears uniformly on trench bottom.
 - G. Deflections at joints shall not exceed 75 percent of amount allowed by pipe manufacturer, unless otherwise approved by Engineer.
 - H. Field cut pipe, where required, with machine specially designed for cutting the type of pipe being installed. Make cuts carefully, without damage to pipe, coating or lining, and with smooth end at right angles to axis of pipe. Cut ends on push-on joint type pipe shall be tapered, and sharp edges shall be filed off smooth. Do not flame-cut pipe.
 - I. Do not place blocking under pipe, unless specifically approved by Engineer for special conditions.
 - J. Touch up protective coatings in manner satisfactory to Engineer prior to backfilling.
 - K. Notify Engineer in advance of backfilling operations.
 - L. On steep slopes, take measures acceptable to Engineer to prevent movement of pipe during installation.
 - M. Thrust Restraint: Where required by specifications or shown on Contract Documents, provide thrust restraint. Provide thrust restraint for fittings & valves even on gravity process lines.
 - N. Exercise care to avoid flotation when installing pipe in cast-in-place concrete, and in locations with high groundwater.
 - O. The pipe shall be protected during handling against impact shocks and free fall. Care shall be taken to avoid dragging the spigot ring on the ground or allowing it to be damaged by contact with gravel, crushed stone, or other hard objects.
 - P. After being delivered alongside the trench, the pipe shall be carefully examined for soundness or damage. No piece of pipe or fitting which is known to be defective shall be laid or placed in the lines. If any defective pipe or fitting shall be discovered after the pipe is laid, it shall be removed and replaced with a satisfactory pipe or fitting without additional charge. Before each piece of pipe is lowered into the trench, it shall be thoroughly cleaned out. Each piece of pipe shall be lowered separately unless special permission is given otherwise by the ENGINEER. In case a length of pipe is cut to fit in a line, it shall be so cut as to leave a smooth end at right angles to the longitudinal axis of the pipe.
 - Q. The bell and spigot of the joint shall be cleaned of dirt and foreign matter immediately prior to jointing. The contact surfaces shall be coated with a lubricant, primer or adhesive recommended by the pipe manufacturer, and pushed together until the joint snaps distinctly in place. The pushing together of the pipe may be done by hand or by the use of a bar.
 - R. All pipe shall be laid straight between changes in alignment and at uniform grade between changes in grade. When jointed in the trench the pipe shall form a true and smooth line.

- S. Trenches shall be kept dry during pipe laying. Before pipe laying is started, all water that may have collected in the trench shall be removed.

3.6 JOINTING PIPE:

- A. General: Conform to the requirements of the pipe manufacturer and installation standards specified elsewhere in the Contract Documents.

B. Ductile Iron Mechanical Joint Pipe:

1. Immediately before making joint, wipe clean the socket, plain end, and adjacent areas. Taper cut ends and file off sharp edges to provide smooth surface.
2. Lubricate plain ends and gasket with manufacturer's recommended pipe lubricant, in accordance with ANSI/AWWA C111, just prior to slipping gasket onto plain end of the joint assembly.
3. Place gland on plain end with lip extension toward the plain end, followed by gasket with narrow edge of gasket toward plain end.
4. Insert plain end of pipe into socket and press gasket firmly and evenly into gasket recess. Keep joint straight during assembly.
5. Push gland toward socket and center gland around pipe with gland lip against gasket.
6. Insert bolts and hand-tighten nuts.
7. If deflection is required, make deflection after joint assembly and prior to tightening bolts. Alternately tighten bolts approximately 180 degrees apart to seat gasket evenly. Bolt torque shall be as follows:

Pipe Diameter (inches)	Bolt Diameter (inches)	Range of Torque (ft-lbs)
3	5/8	45 to 60
4 to 24	¾	75 to 90
30 to 36	1	100 to 120
42 to 48	1.25	120 to 150

8. Bolts and nuts, except those of stainless steel, shall be coated with two coats, minimum dry film thickness of eight mils each, of high build solids epoxy or bituminous coating manufactured by Tnemec, or equal.
9. Restrained mechanical joints shall be in accordance with this specification.

C. Ductile Iron Proprietary Joints:

1. Install pipe that utilizes proprietary joints for restraint specified in accordance with manufacturer's instructions.

D. Ductile Iron Flanged Joints:

1. Assemble flanged joints using ring-type gaskets, thickness as recommended by pipe manufacturer but not less than 1/8-inch thick, for raised face flanges. Use full face

gaskets for flat face flanges, unless otherwise approved by ENGINEER or recommended by pipe manufacturer. Gaskets shall be suitable for service intended in accordance with manufacturer's ratings and instructions. Gaskets shall be properly centered.

2. Bolts shall be tightened as recommended by the manufacturer in sequence that ensures equal distribution of bolt loads.
3. Length of bolts shall be uniform. Bolts shall not project beyond the nut more than 1/4-inch when fully tightened. Bolts shall not fall short of the nut when fully taken up. Ends of bolts shall be machine cut and neatly rounded. Do not use washers.
4. Prior to assembly, lubricate bolt threads and gasket faces.
5. After assembly, coat all bolts and nuts, except those of stainless steel, with two coats, minimum dry film thickness of eight mils each, of high-build epoxy or bituminous coating manufactured by Tnemec, or equal.

E. Thermoplastic Pipe Joints:

1. Bell and Spigot Joints:
 - a. Bevel pipe ends, remove all burrs, and provide a reference mark at correct distance from pipe end before making joints.
 - b. Clean spigot end and bell thoroughly before making the joint. Insert O-ring gasket while ensuring that gasket is properly oriented. Lubricate spigot with manufacturer's recommended lubricant. Do not lubricate bell and O-ring. Insert spigot end of pipe carefully into bell until reference mark on spigot is flush with bell.

F. Mechanical Coupling Joints:

1. Mechanical couplings include: sleeve-type flexible couplings, split flexible couplings, ANSI/AWWA C606 grooved or shouldered end couplings, plasticized PVC couplings, and other mechanical couplings specified.
2. Prior to installing and assembling mechanical couplings, thoroughly clean joint ends with wire brush to remove foreign matter.
3. For mechanical couplings that incorporate gaskets, after cleaning apply manufacture's recommended lubricant to rubber gasket or inside of coupling housing and to joint ends. After lubrication, install gasket around joint end of previously installed piece and mate joint end of subsequent piece to installed piece. Position gasket and place coupling housing around gasket and over grooved or shouldered joint ends. Insert bolts and install nuts tightly by hand. Tighten bolts uniformly to produce an equal pressure on all parts of housing. When housing clamps meet metal to metal, joint is complete and further tightening is not required.
4. For plasticized PVC couplings, loosen the stainless steel clamping bands and remove clamps from coupling. Slide coupling over plain ends of pipes to be joined without using manufacture's recommended lubricants. Place clamps over each end of coupling at grooved section and tighten with torque wrench to torque recommended by manufacturer.

G. Ductile Iron Push-On Joint Pipe:

1. Prior to assembling joints, thoroughly clean with wire brush the last eight inches of exterior surface of spigot and interior surface of bell, except where joints are lined or coated with a protective lining or coating.
2. Wipe clean rubber gaskets and flex gaskets until resilient. Conform to manufacturer's instructions for procedures to ensure gasket resiliency when assembling joints in cold weather.

3. Insert gasket into joint recess and smooth out entire circumference of gasket to remove bulges and to prevent interference with proper entry of spigot of entering pipe.
4. Immediately prior to joint assembly, apply thin film of pipe manufacturer's recommended lubricant to surface of gasket that will come in contact with entering spigot end of pipe, or apply a thin film of lubricant to outside of spigot of entering pipe.
5. For assembly, center spigot in pipe bell and push pipe forward until spigot just makes contact with rubber gasket. After gasket is compressed and before pipe is pushed or pulled in the rest of the way, carefully check gasket for proper position around the full circumference of joint. Final assembly shall be made by forcing spigot end of entering pipe past gasket until spigot makes contact with base of the bell. When more than a reasonable amount of force is required to assemble the joint, remove spigot end of pipe to verify proper positioning of gasket. Do not use gaskets that have been scored or otherwise damaged.
6. Maintain an adequate supply of gaskets and manufacture's recommended joint lubricant at the Site when pipe jointing operations are in progress.

H. Certa- Lok PVC Joints:

1. Unless otherwise specified, pipe shall be assembled in the field. The Contractor shall follow the pipe supplier's written guidelines for this procedure.
2. The pipe shall be joined using a separate PVC coupling with beveled edges, built-in sealing gaskets and restraining grooves. The restraining splines shall be square or rectangular, and made from Nylon 101.
3. Exposed splines shall be cut flush to coupling to reduce soil drag.
4. Couplings shall be beveled on leading edges to minimize soil friction.
5. Provide elastomeric gaskets complying with ASTM F477 and ASTM D3139.
6. Restrained Joints: Provide restrained joints where shown or indicated.

3.7 PIPE BACKFILLING

- A. Conform to applicable requirements of the Contract Documents. Refer to Section 02220 Earthwork.
- B. Place backfill as Work progresses. Backfill by hand and use power tampers until pipe is covered with at least one foot of backfill.

3.8 Connections to Meter Assemblies, Backflow Prevention Assemblies, Valves, and Hydrants:

- A. Install meters, backflow prevention, valves and hydrants as shown and indicated in the Contract Documents.
- B. Provide suitable adapters when meter assemblies, backflow prevention assemblies, valves or hydrants and piping have different joint types.
- C. Provide thrust restraint at all meter assemblies, backflow prevention assemblies, hydrants, and at valves.

3.9 Transitions from One Type of Pipe to Another:

- A. Provide necessary adapters, specials, and connection pieces required when connecting different types and sizes of pipe or connecting pipe made by different manufacturers.

3.10 Closures:

- A. Provide closure pieces shown or required to complete the Work.

3.11 Setting Valve Boxes

- A. Cast iron valve boxes shall be firmly supported, and maintained centered and plumb over the operating nut of the valve, with box cover flush with the surface of the finished pavement or finished grade of the surrounding area or any such other level as may be directed.

3.12 Concrete Cradle and Encasement:

- A. Where subgrade conditions, in the opinion of the Engineer, warrant extra precautions for the bedding or encasement of pipe, the Engineer may order the construction of a concrete cradle and/or encasement to be installed in conformance with the size and dimensions indicated on the plans. All concrete used in the concrete cradle shall be in accordance with Division 3 Concrete specifications.

3.13 INTERIOR PIPING INSTALLATION

- A. It shall be the CONTRACTOR'S responsibility to furnish a complete system of pipe supports, to provide expansion joints and to anchor all piping. The pipe support system shall be installed complete with all necessary inserts, bolts, nuts, rods, washers, miscellaneous steel, and other accessories. The CONTRACTOR(S) shall submit shop drawings on the pipe supporting system, including type and size of supports, details on thrust anchorage and all their locations.
- B. In some instances, expansion joints have been shown on the drawings, but no attempt has been made to indicate every expansion joint for piping included under this portion of the specifications. Portions of the piping are shown on the detail drawings. Some of the piping, however, is shown only on the schematics.
- C. Reaction Anchorage and Blocking: All piping exposed in interior locations and subject to internal pressure in which flexible connectors are used shall be blocked, anchored, or harnessed, as shown on the drawings, or as directed by the ENGINEER to preclude separation of joints.
- D. Pipe Hangers (see specification Section 15140).
- E. Concrete Inserts:
 - 1. Concrete inserts shall be provided at locations to support piping where structural steel supports are not readily available. Inserts shall be located so that the total load on any insert does not exceed the manufacturer's recommended maximum load. The location of all inserts shall be approved by the ENGINEER.
 - 2. Where it is necessary to anchor supports to hardened concrete or complete masonry, expansion anchors of the type described in the anchor bolt and expansion anchors

section shall be used. All expansion anchors shall be sized as required for the service with minimum safety factor of five.

3. Individual concrete inserts shall be Grinnell "Fig. 282", Unistrut M26, or equal. Continuous concrete inserts shall be Unistrut "P-3200 Series", Fee and Mason, or equal.

F. Brackets and Anchors:

1. For suspended piping, anchors shall be centered, as closely as possible, between expansion joints, and between elbows and expansion joints. Anchors shall hold the pipe securely and shall be sufficiently rigid to force expansion and contraction movement to take place at expansion joints and elbows.
2. Thrust Anchors: Anchorage shall be provided as required to resist thrust due to changes in diameter or direction, or dead ending of pipelines. Anchorage shall be required wherever bending stresses exceed the allowable for the pipe.
3. Brackets and anchors shall be installed as required. They shall be Unistrut "P-1000 Series" with all parts stainless steel, Grinnell "Fig 199" painted with rust inhibitive primer, or equal, or fabricated stainless steel.

G. Guides: Pipe guides shall be provided adjacent to sliding expansion joints in accordance with the recommendations of the National Association of Expansion Joint Manufacturers.

H. Wall Sleeves: See Section 15065.

I. Anti-Seize Compounds: An anti-seize compound shall be applied to all nuts and bolts.

J. Contact between dissimilar metals shall be prevented.

In all cases where piping is in contact with a concrete or metal pipe support, a 1/8 inch thick Teflon, neoprene rubber or plastic strip shall be placed under all piping at the point of bearing. Each strip shall be cut to fit the entire area of contact between pipe and support and shall be neat.

K. Location:

1. In general, the piping work under this Contract shall be done in accordance with the arrangements shown on the plans. The runs of piping are, in part, diagrammatic and the CONTRACTOR(S) shall without extra cost run the piping as directed by the ENGINEER at the time of installation, so as to best fit the conditions in the building, and so that no piping shall pass through beams or other structural members in such a way as to impair their strength.
2. Special care shall be exercised to keep all piping in the building in locations as shown on the plans and to install the risers and horizontal runs so as to occupy a minimum space.
3. Changes in runs and location to meter field conditions shall be done with extra cost to the OWNER.
4. All horizontal lines carrying liquids shall be pitched to facilitate draining and all low points shall be provided with 3/4 inch hose bids suitable for the material being handled, located so that the entire system can be drained.
5. Expansion joint locations shall coincide with building control joints and as shown on the plans.
6. Pipe supports and expansions joints shall satisfy the following conditions:

TYPE OF PIPE	MAX. PIPE SUPPORT BRACING (FEET)	LIQUID PIPING MAX. LENGTH OF STRAIGHT RUN WITHOUT BEND OR EXPANSION JOINT (FEET)	AIR PIPING MAX. LENGTH OF STRAIGHT RUN WITHOUT BEND OR EXPANSION JOINT (FEET)
Ductile Iron	14	80	40
Steel:			
6" and Over	20	80	40
5" to 2-1/2"	14	50	25
2" to 1"	10	50	25
Under 1"	8	50	25
Copper:			
2" to 3/4"	7	50	N/A
Under 3/4"	7	N/A	N/A
Plastic and Fiberglass Reinforced Plastic:			
3" to 1-1/2"	9	30	N/A
Under 1-1/2"	5	30	N/A

Unless otherwise shown or authorized by the ENGINEER, piping running parallel to walls shall be placed approximately 1-1/2 in. out from the face of the wall and at least 3 in. below ceilings.

3.14 INSTALLATION OF STAINLESS STEEL PIPE

- A. Steel pipe shall be installed true to alignment, and rigidly supported anchors shall be provided where indicated. After installation, the piping shall be tested by undergoing a one-hour pressure test at twice the designed operating pressure. If any joint or pipe proves to be defective.
- B. All threads shall be clean, machine cut, and all pipe shall be reamed before erection. Each length of pipe as erected shall be up-ended and rapped to dislodge dirt and scale.
- C. Screwed joints shall be made up with good quality thread compound and applied to the male thread only. After having been set up, a joint must not be backed off unless the joint is completely broken, the threads cleaned and new compound applied. All joints shall be air tight.
- D. All piping shall have a sufficient number of unions to allow convenient removal of piping. Unions shall be compatible with pipe.

- E. Sleeves of the proper size shall be installed for pipes passing through floors and walls as indicated on the Drawings. Sleeves shall be given a prime coat of rust-inhibitive primer such as Koppers No. 621, or equal, as manufactured by Carboline or Tnemec.
- F. When cutting of pipe is required, the cutting shall be done by machine in a neat workmanlike manner without damage to the pipe. Cut ends shall be smooth and at right angles to the axis of the pipe.
- G. All field welding shall be in accordance with the American Welding Society Standards. No field welding of stainless steel piping will be allowed. The strength of the field weld shall develop the strength of the pipe.

3.15 INSTALLATION OF HIGH-DENSITY POLYETHYLENE PIPE

- A. General: Pipe and Fittings: Size as indicated on the plans (Iron Pipe Size - IPS or Ductile Iron Pipe Size - DIPS). Install as shown in accordance with manufacturer's recommendations.
- B. Hauling, Unloading, and Distributing Pipe: During loading, transportation and unloading, every precaution shall be taken to prevent injury to the pipe. No pipe shall be dropped from cars or trucks, or allowed to roll down slides without proper retaining ropes. During transportation each pipe shall rest on suitable pads, strips, skids or blocks securely wedged or tied in place. Any pipe damaged shall be replaced.
- C. Fusion:
 - 1. Sections of polyethylene pipe should be joined into continuous lengths on the jobsite above ground. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt fusion equipment used in the joining procedures should be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, temperature requirements of 400 degrees Fahrenheit, alignment, and an interfacial fusion pressure of 75 PSI. The butt fusion joining will produce a joint weld strength equal to or greater than the tensile strength of the pipe itself. All field welds shall be made with fusion equipment equipped with a Data Logger. Temperature, fusion pressure and a graphic representation of the fusion cycle shall be part of the Quality Control records.
 - 2. Sidewall fusions for connections to outlet piping shall be performed in accordance with HDPE pipe and fitting manufacturer's specifications. The heating irons used for sidewall fusion shall have an inside diameter equal to the outside diameter of the HDPE pipe being fused. The size of the heating iron shall be 1/4 inch larger than the size of the outlet branch being fused.
 - 3. Mechanical joining will be used where the butt fusion method cannot be used. Mechanical joining will be accomplished by either using a HDPE flange adapter with a Ductile Iron back-up ring or HDPE Mechanical Joint adapter with a Ductile Iron back-up ring.
 - 4. Socket fusion, hot gas fusion, threading, solvents, and epoxies will not be used to join HDPE pipe.
- D. Inspection: Inspect the pipe for defects before installation and fusion. Defective, damaged or unsound pipe will be rejected.

3.16 TRACER WIRE INSTALLATION

- A. Tracing Wire
1. Tracing wire is required on all force mains, not exclusive to non-metal pipe.

2. Tracing wire shall be laid directly over the water main/force main and attached to the pipe at regular intervals not to exceed ten (10) feet.

3. Attach the tracer wire to the pipe using plastic “zip” strapping or metal wire.

4. The following technique shall be used to splice wires together: Carefully peel off coding on wire, twist 6-8 times, fold down wire, and wrap with electrical tape. The electrical tape need not to be waterproof. Alternatively, utilize a mechanical crimper.

5. For valves, the wire shall be brought up the outside of the valve box riser and attached to the riser at regular intervals not to exceed two (2) feet. The wires shall be drawn through a ½ inch diameter hole to be cut in the valve box riser and knotted to keep at ground level with an excess length of 4”-6” that is to be folded down in the valve box. Ensure that the opening is sized adequate so the cover will fit snug onto the valve box, once the tracer wire is installed.

6. For air release structures, the wire(s) shall be connected to either the air release valve or isolation valve into and out of the structure.

7. Successful completion of conductivity test observed by the Owner will be required prior to acceptance of force main.

3.17 THRUST RESTRAINT

- A. Provide thrust restraint on piping systems where shown or indicated in the Contract Documents. Note that thrust restraint is required at fittings and valves and as necessary to withstand the specified test pressures on gravity process lines.
- B. Thrust restraint may be accomplished by using restrained pipe joints, or harnessing buried pipe if approved by Engineer in writing. Thrust restraints shall be designed for axial thrust exerted by test pressure specified on Contract Drawings.
- C. Restrained Pipe Joints:

1. Pipe joints shall be restrained by means suitable for the type of pipe being installed.

a. Ductile Iron, Push-on Joints and Mechanical Joints: Restrain with proprietary restrained joint system; or other suitable joint restraint system, subject to the approval of Engineer.

b. Thermoplastic and HDPE Joints: Where bell and spigot-type or other non-restrained joints are utilized, provide proprietary restrained joint system; or other suitable joint restraint system, subject to the approval of Engineer.
- D. Provide joint restraint for the minimum lengths noted below:

PIPE RESTRAINT LENGTHS (FEET, 100 PSI, PVC)							
PIPE DIA	HORIZONTAL BENDS				VERTICAL DOWN BENDS		PIPE DIA.
	11.25°	22.5°	45°	90°	22.5°	45°	

4"	2	3	5	12	6	11	27	27	27	4"
6"	2	4	7	17	8	16	38	38	38	6"
10"	3	6	11	26	12	25	59	59	59	10"
12"	3	6	13	30	14	29	70	70	70	12"
16"	4	8	16	39	18	38	90	90	90	16"
18"	5	9	18	43	20	42	100	100	100	18"

PIPE RESTRAINT LENGTHS (FEET, 100 PSI, POLY WRAPPED DUCTILE)										
PIPE DIA	HORIZONTAL BENDS				VERTICAL DOWN BENDS		DEAD ENDS	VALVES (EA. SIDE)	TEES/WYES (BRANCH)	PIPE DIA.
	11.25°	22.5°	45°	90°	22.5°	45°				
4"	2	3	6	15	7	14	33	33	33	4"
6"	2	4	9	21	10	19	46	46	46	6"
10"	4	7	14	32	15	30	72	72	72	10"
12"	4	8	16	37	17	35	85	85	85	12"
16"	5	10	20	48	22	45	109	109	109	16"
18"	6	11	22	52	24	50	121	121	121	18"

PIPE RESTRAINT LENGTHS (FEET, 150 PSI, PVC)										
PIPE DIA	HORIZONTAL BENDS				VERTICAL DOWN BENDS		DEAD ENDS	VALVES (EA. SIDE)	TEES/WYES (BRANCH)	PIPE DIA.
	11.25°	22.5°	45°	90°	22.5°	45°				
2"	2	3	6	13	6	13	29	29	29	2"
4"	2	3	6	14	7	14	32	32	32	4"

PIPE RESTRAINT LENGTHS (FEET, 100 PSI, DUCTILE IRON)										
PIPE DIA	HORIZONTAL BENDS				VERTICAL DOWN BENDS		DEAD ENDS	VALVES (EA. SIDE)	TEES/WYES (BRANCH)	PIPE DIA.
	11.25°	22.5°	45°	90°	22.5°	45°				
4"	1	2	4	9	3	6	15	15	15	4"
6"	2	3	6	13	5	9	21	21	21	6"

10"	2	4	9	20	7	14	33	33	33	10"
12"	3	5	10	23	8	16	38	38	38	12"
16"	3	6	13	30	10	21	49	49	49	16"
18"	4	7	14	33	11	23	55	55	55	18"

1. Reducers:

- a. 18"x16": Restraint Length 21 feet (100 PSI, PVC)
- b. 12"x10": Restraint Length 21 feet (100 PSI, PVC)
- c. 6"x3": Restraint Length 25 feet (100 PSI, PVC)
- d. 18"x16": Restraint Length 25 feet (100 PSI, POLY WRAPPED DUCTILE)
- e. 12"x10": Restraint Length 25 feet (100 PSI, POLY WRAPPED DUCTILE)
- f. 6"x3": Restraint Length 31 feet (100 PSI, POLY WRAPPED DUCTILE)
- g. 18"x16": Restraint Length 12 feet (100 PSI, DUCTILE IRON)
- h. 12"x10": Restraint Length 12 feet (100 PSI, DUCTILE IRON)
- i. 6"x3": Restraint Length 14 feet (100 PSI, DUCTILE IRON)
- j. 4"x2": Restraint Length 15 feet (150 PSI, PVC)

2. Tables based on:

- a. a minimum safety factor of 1.5,
- b. the test pressure specified on the drawings,
- c. a Type 3 trench,
- d. 4' depth of bury for 100 psi lines and 5' depth of bury for 150 psi lines,
- e. and an ML inorganic silts, very fine sands, silty or clayey fine sands soil classification.

- E. For pressures or pipe materials for which a table is not provided, the Contractor shall submit a restraint length table for review and approval by the Engineer based on DIPRA or EBAA Iron restraint calculators.

3.18 WORK AFFECTING EXISTING PIPING

A. Location of Existing Underground Facilities:

1. Locations of existing underground facilities shown on the Drawings should be considered approximate.
2. Determine the true location of existing underground facilities to which connections are to be made, crossed, and that could be disturbed, and determine location of underground facilities that could be disturbed prior to beginning of excavation and backfilling operations, or that may be affected by the Work.

B. Taking Existing Pipelines and Underground Facilities Out of Service:

1. Do not take pipelines or underground facilities out of service unless specifically listed in the Contract Documents, or approved by Engineer.
2. Notify Engineer in writing prior to taking pipeline or underground facilities out of service. Shutdown notification shall be provided in advance of the shutdown in accordance with the Contract Documents.

C. Work on Existing Pipelines or Underground Facilities:

1. Cut or tap piping or underground facilities as shown or required with machines specifically designed for cutting or tapping pipelines or underground facilities, as applicable.
2. Install temporary plugs to prevent entry of mud, dirt, water, and debris into pipe.
3. Provide necessary adapters, sleeves, fittings, pipe, and appurtenances required to complete the Work.

3.19 POLYETHYLENE ENCASEMENT (REQUIRED FOR BURIED DUCTILE IRON AIR PIPING ONLY)

- A. Provide polyethylene encasement for ductile iron piping to prevent contact between pipe and surrounding bedding material and backfill.
- B. Polyethylene encasement installation shall be in accordance with AWWA C105.
- C. Lumps of clay, mud, cinders etc. on the pipe surface shall be removed prior to installation of the polyethylene encasement.
- D. Polyethylene film shall be fitted to the contour of the pipe creating a snug, but not tight, encasement with the minimum space between the polyethylene and the pipe. Sufficient slack shall be provided in contouring to prevent stretching the polyethylene where it bridges irregular surfaces, such as, bell-spigot interfaces, bolted joints or fittings and to prevent damage to the polyethylene caused by backfilling operations.
- E. Overlaps and ends shall be secured with adhesive tape or plastic tie straps.
- F. Installations below the water table tube-form polyethylene should be used with both ends thoroughly sealed with adhesive tape or plastic tie straps at the joint overlaps.

3.20 FIELD QUALITY CONTROL

- A. General Testing Requirements:
 1. Test all piping, except as exempted by the Engineer or Owner's representative in writing.
 2. When authorities having jurisdiction are to witness tests, notify Engineer and authorities having jurisdiction in writing at least 48 hours in advance of testing.
 3. Conduct all tests in presence of Engineer or Owner's representative.
 4. Remove or protect pipeline-mounted devices that could be damaged by testing.
 5. Provide all apparatus and services required for testing, including:
 - a. Test risers and associated connections to the main, test pumps, compressors, hoses, calibrated gauges, meters, test containers, valves, fittings, and temporary pumping systems required to maintain Owner's operations.
 - b. Temporary bulkheads, bracing, blocking, and thrust restraints.
 6. Provide air if an air test is required, power if pumping is required, and gases if gases are required.
 7. All leaks, broken or cracked pipe, valves, etc. which are identified by testing shall be repaired. Any sections of main which do not meet test acceptance criteria shall be repaired or replaced. Retest after repair.

8. Unless otherwise specified, testing shall include existing piping systems that connect with new piping system. Test existing pipe to nearest structure. Piping not installed by Contractor and that fails the test shall be repaired upon authorization of Owner. Unless otherwise included in the Work, repair of existing piping or underground facilities will be paid as extra Work.
 9. Test to confirm connectivity of tracer wire.
- B. During the final inspection; the ENGINEER will inspect each individual line, either by use of lights or other means at his disposal to determine whether the completed lines are true to line and grade as laid out or as shown on the Drawings.
 - C. All lines or sections of lines that are found to be laid improperly with respect to line or grade, that are found to contain broken or leaking sections of pipe, or are obstructed in such a manner that they cannot be satisfactorily corrected otherwise, shall be removed and replaced at the CONTRACTOR'S expense.
 - D. The CONTRACTOR(S) shall perform pressure tests on all pressure pipe lines and appurtenances at the project site. Prior to the testing, all air shall be expelled from the pipe. All pipe lines and appurtenances shall be tested up to 50 percent over the normal system operating pressure or to the pipe pressure rating class, whichever pressure is less, unless otherwise noted. The normal system operating pressure shall be determined at the low point of the test pipe section. At no time shall the test pressure exceed the pressure pipe rate class. Force main lines shall be pressure tested for 100 psi and water lines shall be tested for 150 psi.
 - E. A pipe section shall be accepted as passing the pressure test if the test pressure does not decrease more than five (5) percent for the two (2) hour test period. For each test pipe section, the ENGINEER may waive the requirement of a leakage test (see following section) if there is no drop in pressure during the pressure test. Recording pressure charts shall be turned over to the ENGINEER at the conclusion of tests.
- 3.21 GRAVITY PIPE TESTING:
- A. Test to be performed 30 days after installation.
 - B. Flexible piping shall allow passage of a cylinder that is no smaller than 95% of the pipe inside diameter.
 - C. Any piping that is damaged shall be removed and re-installed before approval.
 - D. Air test plastic pipe according to ASTM F1417-92: "Standard Test Method for Installation Acceptance of plastic gravity sewer lines using Low-Pressure Air".
 - E. Test PVC Piping according to AWWA M23, "Testing and Maintenance" Chapter.
- 3.22 GRAVITY PIPE TESTING, LINES UNDER PRESSURE
- A. Contractor to provide hydrostatic pressure test for all process pipes (see Pipe Schedule in Drawings). Contractor may submit alternative test method (air, etc.) for *consideration* by the Engineer for gravity process pipes.

3.23 HYDROSTATIC TESTING:

A. General:

1. All newly installed mains must be pressure and leak tested prior to final acceptance.
2. Contractor shall furnish all labor and equipment necessary to perform the pressure tests which may include, but is not limited to, furnishing plugs, caps, fittings, test risers, pipe connections, gauges, water pumps or other equipment as necessary.
3. The pressure testing shall be performed by the Contractor(s) and observed by the Engineer. Contractor(s) to provide 48 hour advance notice of testing.
4. The Owner will provide water for pressure testing except for water required due to a failed test. Contractor(s) shall provide means to convey water for hydrostatic testing into piping being tested. Contractor(s) shall provide water for other types of testing required.

B. Preparation

1. Pipeline shall be laid and backfilled.
2. Valves shall be properly located, operable, and plumb and at correct elevation. Valve boxes shall be centered over operating nuts and the top of the box shall be at correct elevation.
3. Lines shall be properly vented to eliminate entrapped air.
4. Prior to testing, ensure adequate thrust protection is in place and joints are properly installed.

C. Test Procedure:

1. For thermoplastic pipe, follow preparation and procedures described in Section 7 of ANSI/AWWA Standard C605.
2. For ductile iron piping, follow preparation & procedures described in AWWA C600.
3. Wetting period is not required for pipe that is not cement mortar-lined.
4. Fill pipeline slowly to minimize air entrapment and surge pressures. Fill rate shall not exceed one foot of pipe length per second in pipe being tested.
5. Expel air from pipe as required by venting through air release valves, blow-offs, or special taps at high points in line. Obtain approval of Engineer prior to tapping pipe for expelling air.
6. During the test, examine all exposed pipe, fittings, valves and appurtenances for leakage. Make repairs to eliminate visible leakage.
7. After specified wetting period, add fluid as required to pressurize line to required test pressure. Maintain test pressure for a stabilization period of ten minutes before beginning test.
8. Timed test period shall not begin until after pipe has been filled, exposed to required wetting period, air has been expelled, and pressure stabilized.
9. Timed Test Period: After stabilization period, maintain test pressure for at least two hours. During timed testing period, add fluid as required to maintain pressure within five psig of required test pressure. For HDPE pipe, after three hour expansion phase, reduce test pressure by ten psig and do not add liquid. Test pressure shall then remain steady for one hour, indicating no leakage.

10. Pump from test container to maintain test pressure. Measure volume of water pumped from test container and record on test report. Record pressure at test pump at 15 minute intervals for duration of test.
- D. Allowable Leakage Rates: Leakage is defined as the quantity of water supplied to pipe segment being tested to maintain pressure within five psi of test pressure during timed test period. Allowable leakage rates for piping are:

1. No Leakage: Pipes with flanged, welded, fused, threaded, soldered, or brazed joints.

2. Leakage shall be less than the allowable amounts specified in AWWA C600 for ductile iron pipe or AWWA C605 for PVC pipe, and less than that determined by the following formula:

$$L = \frac{S \cdot D \cdot (\text{Square Root of } P)}{148,000}$$

L = allowable leakage, gallons per hour
S = length of pipe tested, feet
D = nominal diameter of pipe, inches
P = average test pressure during leakage test, psi

3. Observed leaks shall be repaired regardless of leakage measurements.
4. Any damaged or defective pipes, fittings, valves, or joints should be repaired and the pressure test repeated until satisfactory results are obtained.

3.24 SPECIAL REQUIREMENTS FOR HDPE PIPE TESTING

HDPE pipelines shall be tested per ASTM F2164 - Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure and as described herein. The CONTRACTOR(S) may select a Monitored Make-up Water Test or a Non-Monitored Make-up Water Test for each pipeline, as described below:

- A. MONITORED MAKE-UP WATER TEST:

1. Initial Expansion Phase: During the initial expansion phase, the test section is pressurized to the test pressure, and sufficient make-up water is added each hour for three (3) hours to return to test pressure. After the initial expansion phase, about four (4) hours after pressurization, the test phase begins.

2. Test Phase: The test phase will be two (2) hours, after which a measured amount of make-up water is added to return to test pressure. If the amount of make-up water added does not exceed the values listed below, leakage is not indicated:

Nom. Pipe Size (in)	Gal/100 ft Pipe	Nom. Pipe Size (in)	Gal/100ft Pipe
2	0.11	20	5.50
3	0.15	22	7.00
4	0.25	24	8.90
5	0.38	28	11.10
6	0.60	30	12.70
8	1.00	32	14.30
10	1.30	36	18.00
12	2.30	42	23.10

14	2.80	48	27.00
16	3.30	54	31.40
18	4.30		

B. NON-MONITORED MAKE-UP WATER TEST:

1. Initial Expansion Phase: For the initial expansion phase, make-up water is added as required to maintain the test pressure for four (4) hours.
2. Test Phase: For the test phase, the test pressure is reduced by 10 psi. If the pressure remains steady, within 5% of the target value, for an hour, no leakage is indicated.

3.25 CLEANING & DISINFECTION FOR WATER LINES:

A. Cleaning, General: Clean pipe systems as follows:

1. Thoroughly clean all piping, including flushing with water, in manner approved by Engineer, prior to placing in service. Flushing may occur prior to or after pressure testing, but prior to disinfection. Following disinfection, flush chlorine solution and sodium hypochlorite piping with water.
2. Flushing operation shall maintain a minimum velocity of 2.5 ft/sec in main. Taps and openings shall be provided by the Contractor(s) as necessary to achieve minimum velocity.
3. The Contractor(s) shall submit a method and schedule for flushing to the Engineer.
4. Piping 24-inch diameter and larger shall be inspected from inside and debris, dirt and foreign matter removed.
5. For piping that requires disinfection and has not been kept clean during storage or installation, swab each section individually before installation with five percent sodium hypochlorite solution.

B. Disinfection:

1. Disinfect all potable and finished water piping.
2. Disinfect following pressure tests and prior to connection to existing water main.
3. Suggested procedure for accomplishing complete and satisfactory disinfection is specified below. Other procedures may be considered for acceptance by Engineer.
 - a. Prior to disinfection, clean piping as specified and flush thoroughly per AWWA C651.
 - b. For disinfection, conform to procedures described in ANSI/AWWA C651. Use continuous feed method of disinfecting, unless alternative method is acceptable to Engineer.
4. Chlorine, testing, disinfection, work and all necessary equipment shall be provided by Contractor(s). Chlorine gas is not permitted on the jobsite.
5. Chlorine concentration in water entering the piping shall be between 50 and 100 ppm, such that minimum residual concentration of at least 25 mg/L initial shall remain in the pipe after 24 hours.
6. Disinfect piping and all related components. Repeat as necessary to complete disinfection.

7. Operate all valves during disinfection.
8. Bacteriologic tests will be performed by Contractor(s). Certified test laboratory report must be provided to the Owner.
 - a. Two consecutive safe bacteriological samples shall be taken 24 hours apart before placing the water line into service. Samples shall be collected for every 1,200 feet of new main, plus samples from each branch and the end of the line. If excessive quantities of debris, or trench water, has entered the main, samples shall then be taken at approximately 200-foot intervals. Samples should never be collected from hoses or fire hydrants. A suggested sampling tap is a corporation cock with copper goose neck assembly. The goose neck assembly may be removed after use at the option of the Owner.
9. After required retention period, flush chlorinated water from line at its extremities until all the heavily chlorinated water has been removed, leaving a residual chlorine content not greater than 1.0 ppm. If discharging directly to open drains, discharge water through dechlorinated tablets in mesh sack. Properly dispose of chlorinated water in accordance with Laws and Regulations.
10. Disinfection record:
 - a. Type and form of disinfectant used.
 - b. Date and time of disinfectant injection; start and time of completion.
 - c. Test locations.
 - d. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
 - e. Date and time of flushing start and completion.
 - f. Disinfectant residual after flushing in ppm for each outlet tested.
11. Bacteriological report record:
 - a. Date issued, project name, and testing lab information.
 - b. Time and date of water sample collection.
 - c. Name of person collecting samples.
 - d. Test locations.
 - e. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
 - f. Coliform bacteria test results for each outlet tested.
 - g. Certification that water confirms, or fails to conform, to bacterial standards.
 - h. Bacteriologists signature and authority.
 - i. Flushing to be in accordance with AWWA C651, and shall maintain minimum velocity of 2 ½ feet per second at pipe wall.

3.26 VACUUM TESTING:

A. Manholes

1. Perform vacuum test on all manholes according to ASTM C1244.
2. If possible, each manhole shall be tested immediately after assembly and prior to backfilling. If the test is done after backfilling, the Contractor shall be responsible for re-excavation to locate and correct any leaks that have been identified.
3. The vacuum test shall be done BEFORE the chimney seal is installed and tested.
4. All pipes entering the manhole shall be temporarily plugged, taking care to securely brace the pipes and plugs to prevent them from being drawn into the manhole.
5. Following set-up of test apparatus per manufacturer's recommendations, draw vacuum of ten inches of mercury on manhole being tested.
6. Start test upon reaching specified test vacuum. Test duration shall be in accordance with ASTM C1244.

a. Minimum test times for various manhole diameters shall conform to the following table per ASTM C1244 or be 1 minute; whichever is longer:

Dept h (ft)	Diameter, in.															
	30	33	36	42	48	54	60	66	72	78	84	90	96	102	108	114
Time, in seconds																
<4	6	7	7	9	10	12	13	15	16	18	19	21	23	34	25	27
6	9	10	11	13	15	18	20	22	25	26	29	31	34	36	38	41
8	11	12	14	17	20	23	26	29	33	35	38	41	45	48	51	54
10	14	15	18	22	25	29	33	36	41	44	48	52	56	60	63	6
12	17	18	22	26	30	35	39	43	49	53	57	62	67	71	76	81
14	20	21	25	30	35	41	46	51	57	62	67	72	78	83	89	100
16	22	24	29	34	40	47	53	58	69	70	76	83	89	95	101	114
18	25	27	32	38	45	53	59	65	73	79	86	93	100	107	114	128
20	28	30	35	42	50	58	65	72	81	88	95	103	111	119	126	142
22	31	33	39	46	55	64	72	79	89	97	105	114	122	131	139	156
24	33	36	42	50	59	69	78	87	97	106	114	124	133	143	152	170
26	36	39	46	55	65	76	85	94	105	114	124	134	144	154	164	182
28	39	42	49	59	69	81	91	101	113	123	133	144	154	164	174	192
30	42	45	53	63	74	86	97	108	121	132	143	154	164	174	184	213

Note: Table per ASTM C1244

7. Record vacuum drop at end of test. If vacuum drop is greater than one inch of mercury, pipe segment or manhole fails the test and shall be repaired and retested. If vacuum drop is less than one inch of mercury, manhole passes the test.

3.27 CLEANING

A. Cleaning, General: Clean pipe systems as follows:

1. Thoroughly clean all piping, in manner approved by Engineer, prior to placing in service.

3.28 SEPARATION OF SEWERS AND POTABLE WATER PIPING:

A. Horizontal Separation:

1. Where possible, proposed sanitary sewers shall be separated from existing potable water mains and service lines horizontally by a clear distance of at least ten feet, measured edge to edge.
2. If local conditions preclude the specified clear horizontal separation, installation will be allowed if potable water main is in a separate trench or on an undistributed earth shelf on one side of sewer and with bottom of potable water main at least 18 inches above the crown of the sewer.
3. Exceptions:
 - a. Where it is not possible to provide minimum horizontal separation, construct sewer pipe of pressure pipe complying with public water supply design standards of authority having jurisdiction. Hydrostatically test newly installed pressure piping to a minimum of 125 psi, meeting the testing requirements of this specification.
 - b. Sewer in water grade pipe shall extend from manhole to manhole.

B. Vertical Separation:

1. Provide minimum vertical distance of 18 inches between outside of potable water main and outside of sewer when sewer crosses above or below potable water main.
2. Center a section of potable water main pipe at least 17.5 feet long over sewer so that sewer joints are equidistant from potable water main joints.
3. Provide adequate structural support where potable water main crosses above or below sewer. At minimum, provide compacted select backfill for ten feet on each side of crossing.
4. This deviation may allow installation of the sewer closer to the water main, provided that the water is in a separate trench or on an undisturbed earth shelf located on one side of the sewer and at horizontal separation of at least ten feet measured edge to edge.
5. Exception:
 - a. Where it is not possible to provide minimum horizontal separation described above, construct sewer pipe of pressure pipe complying with public water supply design standards of authority having jurisdiction. Hydrostatically test newly installed pressure piping to a minimum of 125 psi, meeting the testing requirements of this specification.
 - b. Sewer in water grade pipe shall extend from manhole to manhole.

3.29 TESTING AIR AND GAS LINES

- A. The CONTRACTOR(S) shall test all air and gas lines and appurtenances with air pressure at least 100% in excess of normal operating pressure. Testing shall be performed prior to back filling unless immediate backfilling is necessary for safety or the protection of property. Pipe shall hold pressure with no more than 1 pound drop per hour at uniform temperature.
- B. While pressure test is on, each joint shall be tested for bubbling air with soap suds brushed on to form a solid film about joint. Any leakage shall be stopped before backfilling.
- C. After test and inspection of joints in a section is opened to exhaust dust from the pipe.
- D. The CONTRACTOR(S) shall furnish all necessary equipment for testing, including air compressor and an accurate pressure gauge.
- E. Inspection of pipe laying shall in no way relieve the CONTRACTOR(S) of the responsibility for passing tests, stopping leakage, or correcting poor workmanship.
- F. All testing shall be in conformity with the Code for Pressure Piping (American Standard) as approved by ANSI.

3.30 CLEAN-UP

- A. Upon completion of the installation of the piping and appurtenances, the CONTRACTOR(S) shall remove all debris and surplus construction materials resulting from the work. The CONTRACTOR(S) shall grade the ground along each side of pipe trenches in a uniform and neat manner leaving the construction area in a shape as near as possible to the original ground line.

END OF SECTION

SECTION 02613
INSTALLATION OF WATER LINE ACCESSORIES

PART 1 - GENERAL

The CONTRACTOR is to supply and install all valves, hydrants, blowoffs and other equipment at the locations shown on the plans in complete accordance with these specifications.

PART 2 - GATE VALVES (THREE INCHES AND LARGER)

2.01 Underground

All underground gate valves shall be iron body, bronze_mounted non_rising stem, tar_coated outside and suitable for working water pressures of 200 PSI. Valves shall be of standard manufacture and of the highest quality both of materials and workmanship and shall conform to the latest revision of AWWA Specification C_500. Valves shall be furnished with bell, flanged or mechanical joint end connections suitable for connection to the pipe with which they are to be used.

Underground valves shall be nut operated, unless otherwise shown on the plans. CONTRACTOR shall furnish three standard stem iron wrenches for turning nut operated valves. All underground valves which have nuts deeper than 30 inches below the top of valve box shall have extended stems with nuts located within 2 feet of valve box cap. Water valve markers shall be placed to indicate the location of water valves and shall be included in the line item cost for valve installation.

The valve maker is to supply the ENGINEER, through the bidder, within one week after award is made, complete catalogs or other material giving complete details and dimensions of valves and accessories. The ENGINEER's approval shall be received by manufacturer prior to shipment of materials.

2.02 Housed

Gate valves, 3" and larger, for fabricated pipe systems shall be double_disc, parallel seat_type, iron body, flanged, fully bronze mounted with O_ring seals, tar_coated outside and suitable for working water pressures of 150 PSI. Valves shall be of standard manufacture and of the highest quality both of materials and workmanship and shall conform to the latest revision of AWWA Specification C_500. Unless otherwise shown on the plans, all housed gate valves shall be O. S & Y. Unless otherwise shown on the plans, all housed valves and valves in basins shall be handwheel operated. Handwheels shall have not less than the following diameters:

Size Valves	Diameter
3"	8"
4"	10"
6"	12"
8"	14"
10"	16"
12"	18"
14"	20"
16"	22"
18"	24"

Valve stand handwheels and handwheels on extended stems, shall have the same minimum diameters as those shown for handwheels directly on valves. Extension stems for O, S & Y valves shall be non_rising, with clamp to valve handwheel and hollow shaft for rising stem of valve, with adjustable cast iron guides per each ten (10) feet of extensions stem length. All extension stems shall be connected with suitable coupling castings for connection to and removal from valves and stands. Nuts and bolts on all extensions stem connections shall be stainless steel.

PART 3 - GATE VALVES (2_1/2" AND SMALLER)

Gate valves 2_1/2" and smaller to be installed in fabricated pipe systems shall be bronze body with handwheel. They shall have inside I.P. threads and be suitable for a minimum water working pressure of 150 PSI. Valves shall have a solid wedge gate.

Underground 2_1/2" and smaller gate valves shall be iron body, bronze mounted, double_disc, parallel seat, having bronze faces and disc rings, with wedge mechanism simple and direct. They shall be similar in all other ways to the larger valves.

PART 4 - CHECK VALVES

4.01 Mechanical

Check valves shall be swing gate type. All check valves shall be standard iron body with straightway passage of full pipe area when swing gate is open. The valve shall be of the outside lever weight_operating type with an adjustable closure rate. The valve must be tight seating and must operate without hammer or shock. The seat ring or lining must be renewable. The valve should be bronze_mounted and may contain a rubber or neoprene lining in accordance with the manufacturer recommendations.

4.02 Electric

Electric solenoid operated check valves shall be installed where shown on the plans. The check valve shall be of cast iron body and cover with all bronze or non_corrosive trim construction. The valve shall be flanged, faced and drilled to conform to 125 lb. ASA Standards. The required valve sizes are shown on the plans. The valve shall be constructed with a non_corrosive lining and a bronze piston. The pilot shall be three_way type, all bronze. The design of the valve shall be such as to prevent hammer and shock. Speed of valve closing and opening shall be adjustable. The valve shall provide full pipe line flow when open. The valve shall provide for emergency closing on electrical outage. It shall also provide manual control for opening main valve. The valve shall be as manufactured by the Golden_Anderson Valve Co., Figure No. 173_D for globe body or Figure No. 174_D for angle body.

The sequence of operation for the electric check valve shall be as follows:

A. Valve openings:

- Pump motor starter, three_way solenoid pilot, emergency solenoid pilot simultaneously energized by control circuit.
- Valve opens as pump reaches full speed.

Limit switch contacts close interlocking with motor starter circuit.

B. Valve closing:

Three_way solenoid pilot de_energized by control circuit.

Pump motor circuit and emergency solenoid pilot remain energized.

Valve starts to close, pump running.

As piston nears its seat, limit switch contacts open, de_energizing pump circuit and emergency solenoid pilot.

In the event of a power failure, the motor starter circuit solenoid operated three_way pilot and the solenoid operated two_way pilot will become de_energized simultaneously. De_energizing both pilots simultaneously will cause the main valve piston to move rapidly to its seat. The speed of emergency closing is adjustable by regulating valve. The emergency closing speed is always at a faster rate than that of the normal closing speed.

The emergency sequence of operation would also pertain in the event of a motor undervoltage, motor overload, or by depressing the emergency stop button if same is used.

PART 5 - AIR RELEASE VALVES

A valve designed to allow exhaust of small pockets of air from the water main while in use shall be installed where shown on the plans or where directed by the ENGINEER. The air release valve shall have a 3/4" iron pipe thread inlet, cast iron body construction, bronze trim, with all internal parts of stainless steel or bronze. The valve shall have an orifice size of 5/64" or greater. Valves shall be suitable for a working water pressure of 150 PSI. The air release valve shall be mounted on 3/4", Schedule 80, galvanized steel riser pipe. The riser pipe shall be connected to the water main by use of a service clamp and a corporation stop as shown in the standard details. The riser pipe shall be connected to the water main by use of a service clamp and a corporation stop as shown in the standard details. The riser shall also have a 3/4", bronze gate valve with a tee_handle, solid wedge type, inside I.P. threads, suitable for a 150 PSI working water pressure. Equipment shall be as manufactured by Mueller, Ford, Crane, Valve and Primer or approved equal.

PART 6 - VALVE BOXES

All valves (gate, air release, check, etc.) installed underground shall be installed in an approved valve box. Each gate valve shall be installed in a vertical position with a valve box. Valve boxes shall be of a cast iron, two or three_piece, slip_type consisting of a base, a center section and a top section with a covered marked "water". Where valve box is constructed in a paved area, the box shall be a screw type box. The entire assembly shall be adjustable for elevation and shall be set vertically and be properly adjusted so that the cover will be in the same plane as the finished street surface (no more than 1/2" above ground in yards or pastures or 2" in unsodded areas.) The assembly must provide for the required cover over the pipe at the installation site and shall rest on concrete pads as shown in the Standard Details.

Air release valves will be installed in the same type of box as is used for meters. As described in these specifications the box may be cast iron, concrete, or concrete pipe. The box must allow for adequate cover over the pipe at the installation.

Check valves installed underground will be installed in the meter box type installation using concrete pipe and a meter box cover. The installation will utilize a suitable pipe diameter to accommodate the valve and accessories in accordance with the standard details. The box must allow for adequate cover over the pipe at the installation.

PART 7 - FLUSH HYDRANTS

Flush hydrants shall be installed in accordance with the details and the specifications at locations shown on the plans or as directed by the ENGINEER. In general, flush hydrants are located at the end of mains for the purpose of clearing the main of sediment, obstacles or impure water. The CONTRACTOR should refer to the Standard Details for flush hydrant installation.

PART 8 - HYDRANTS

All fire hydrants shall be of the compression type, with cast iron body, fully bronze_mounted, suitable for working pressure of 150 pounds per square inch and shall be in accordance with the latest specifications of the AWWA and the State Inspection Bureau. Hydrants shall have two 2_1/2" hose connections and a 4_1/2" steamer connection with National Standard threads.

Hydrants shall be constructed in a manner permitting withdrawal of internal working parts without disturbing barrel or casing. Hydrants shall have dry_top design and non_rising stem and be frost_proof. Valve, when shut, shall be reasonably tight if upper portion of barrel should be broken off. Waterway of hydrants shall be not less than 6" throughout and valve opening shall be at least 5 1/4" in diameter. There shall be no chattering under any conditions of operation. Each hydrant shall be tested to a hydrostatic pressure of 300 PSI with valve in both opened and closed position. The direction of opening shall be cast in the head of the hydrant. Hydrants shall be painted with one coat of red lead and two finishing coats of Koppers Ponkote Enamel for hydrants or approved equal, color to be selected by ENGINEER.

Hydrants shall have mechanical connection directly to lines. Valves supplied with hydrants shall have mechanical joints and may be connected directly to hydrant or may be on hydrant service as shown in the Standard Details. One operating and spanner wrench shall be furnished with each hydrant with a maximum of three provided on any one project. Extensions for extra depth shall be included in the cost of hydrants. One disassembly wrench shall be supplied for the project. Concrete thrust blocking, hydrant bedding and main line tee as shown in the Standard Details are to be included in the unit price for hydrant installation.

Hydrants shall be set so that outlets are not less than 15 inches above the ground, plumb and at a distance of 18 inches from the outside of the curb. If no curb exists, hydrant is to be set four feet from the property line or as shown on the plans.

PART 9 - SPECIAL PURPOSE VALVES

Pressure reducing valves sustaining valves, surge relief valves and other automatic, special_purpose valves which are to be installed as a part of the water line contract will conform with the details shown on the plans. The valves will be installed in water proof manholes or other structures as shown in the Standard Details and as described in the "Miscellaneous Structures" section of these specifications. These valves are to be hydraulically operated and of the self_contained differential_piston type. The valve body shall be cast iron of the globe or angle type. The valve is to be bronze fitted with renewable lining and seating components. The valve shall be pilot controlled and diaphragm operated. The valve shall be air and water cushioned to prevent hammer or shock. Bronze castings shall conform to ASTM B_62 and the cast iron body and lid shall conform to ASTM A_126, Class B.

Individual meter pressure reducing valves will be installed for individual services only where shown on the plans. These valves shall be a Mueller, Model No. H_90001, 3/4" Regulator No. 3 or approved equal, complete with a bronze strainer. Each regulator is to have an adjustable pressure range of 60_125 PSI and is to be set at 80 PSI or as shown on the plans or directed by the ENGINEER. These regulators shall be installed on the inlet side of the meter. The CONTRACTOR should note that some prefabricated meter boxes do not allow space for these regulators and a box of sufficient size must be used where they are required.

PART 10 - METERS AND SERVICES

10.1 Service Lines Not Crossing A Road

All service lines shall be 3/4" Type K Copper Tubing using a corporation stop in accordance with the Standard Details.

10.2 Service Lines Crossing a County Road or City Street

Same as above except that in general all pipe may be jacked beneath certain paved or blacktopped city streets or county roads, unless solid rock prevents using this method in which case, the open trench method will be used. The open trench method generally will be used on all unpaved city streets, county roads and private driveways. In general, blacktopped private driveways shall also be jacked under. In all cases where lines are under traffic, a minimum cover of thirty six (36) inches shall be provided. All backfill shall be compacted by air tampers in layers no greater than 6 inch depth. Specific instructions as to the type of crossing to be installed will be shown on the plans.

10.3 Service Lines Crossing a State Highway

Services shall be jacked or pushed under paving. Pipe under 2" shall be Type K Copper or PVC pipe. If solid rock is encountered, trench will be open-cut, pipe placed and backfilled all in accordance with current requirements of the State Highway Department or the crossing will be relocated to permit boring or jacking. Specific details will be shown on the plans. Where required on the plans or by the ENGINEER, service pipe shall be encased under highways.

Schedule 40 steel pipe shall be used as casing pipe unless otherwise indicated by the plans. Polyethylene pipe will normally be encased. Where permitted rigid PVC pipe will not be encased but soft connections with polyethylene pipe will be required on either side of the boring length.

10.4 Meters

It is the intent of these specifications to obtain water meters which are cold water rotating disc type with hermetically_sealed and magnetically_driven registers. Meters shall be first line quality of the manufacturer. The latest specifications of the AWWA shall be complied with, except in the cases of conflict with these specifications. Any type or make of meter offered must have been manufactured and marketed in the U.S. for at least five (5) years and evidence will be required to indicate the name of places where meters have established satisfactory service records of five (5) years or more. (Check Section IX for specific owner requirements.)

The main case shall be high grade waterworks bronze, with hinged, single lid cover and raised characters cast on them to indicate the direction of flow. Each meter must have a manufacturer's serial number stamped on the lid. They must have a working pressure of 150 PSI. Standard frost bottom model meters shall be furnished. Non_ferrous strainers shall be provided which fit tightly against the main case.

The measuring chamber shall be bronze alloy composition and stainless steel or monel trimmed. The chamber shall be of the two piece design, equipped with a disc made of hard rubber and as near to the specific gravity of water as possible.

The register shall be straight reading U.S. Gallon type. The register unit shall be completely encased and hermetically sealed and driven by permanent magnets. Registers shall be guaranteed by the manufacturer for a period of at least 15 years.

All meters shall measure water within 2% of a separately measured volume. Ten percent of all the meters on the project will be tested after delivery in the presence of the ENGINEER or his designated representative. Testing shall be done by means of test bench and calibrated test tanks as approved by the ENGINEER. If any meter fails this test, the ENGINEER will require that all meters will be tested. The cost of any and all such testing will be at the CONTRACTOR's expense.

Meters shall include box and cover, meter, coppersetter (including cut_off valve), four feet of pipe and corporation stop plus two foot of pipe and plug or cap on the customer's side of meter. (This latter item is to prevent the customer or his plumber from disarranging or loosening the meter after the CONTRACTOR has already set the meter in its proper position). Where the main line is in the highway right_of_way, meters shall be set as close to the right_of_way fence as practicable but no meter on the same side of the road as the main line shall be set with more than 6 feet of service line unless directed by the ENGINEER or shown on the plans. The Standard Details show the required meter setting.

Meters for regular service shall be 5/8" x 3/4" unless otherwise shown on the plans. Large

service connections shall have a disc meter similar and equal to the 5/8" x 3/4" meters and shall include the tap and connection, a gate valve or corporation stop the same size as the line pipe, sufficient unions and a meter box of sufficient size to house the meter as shown in the Standard Details. Meters 2 inches and larger in size shall be compound type meters.

Meter boxes for 5/8" x 3/4" meters shall be cast iron, concrete, concrete pipe, or plastic as specified in Section IX. All meter boxes shall be a minimum of 24 inches deep and 18 inches I.D.. Cast iron meter box cover for use with 18 inch I.D. plastic, concrete or vitrified clay pipe or cylinder boxes shall be stamped with the words "WATER METER," and shall be Ford No. C32, or equal. Where individual pressure reducing valves are required, the meter box must be of adequate size to accommodate the meter setting, shut_off valve and pressure regulator as shown in the Standard Details.

Meter locations shall be determined by the engineer or the engineer's representative. Meters shall be set in a workmanlike manner with backfill neatly compacted in place. In yards, pastures and other grassed areas, top of meter box may be placed no higher than 1/2 inch above original ground and no lower than flush with original ground. Boxes in sidewalks or other concrete areas shall be flush with surface. In areas which have not been sodded, top of box shall be 2 inches above grade. The service line must meet the same cover requirements as the main line as described in these specifications except that the service line may be raised within two (2) feet of each side of the meter installation to a depth which accommodates installation at the bottom of the meter box in accordance with the Standard Details. As shown in the Standard Details, after 2 feet from box service pipe must return to 30 inches (36 inches in traffic or 24 inches in rock). If meter box area is subject to traffic, a deeper box will be required to maintain 36 inches of cover over the service pipe.

PART 11 - TRUCK LOADING STATIONS

Truck loading stations for filling water trucks will be constructed as shown in the Standard Details at the location shown on the plans or as directed by the ENGINEER.

PART 12 - MEASUREMENT AND PAYMENT

Payment for gate valves, check valves and other special valves installed underground shall include all work necessary for a complete installation and shall include all valve stem boxes or other valve boxes and box covers. Payment will be made at the unit price bid for the type and size of valve installation. Often valves are included in the fabricated piping of a structure and separate payment will not be made unless provided in the Bid Form. Costs of those is to be included in the bid for work to which they are subsidiary.

Fire hydrants include the cost of a complete installation as shown on the plans. The cost of the main line tee will be included in the unit price bid for these items. The line between tee and hydrant gate valve shall be paid for at unit price for line work.

Meters and boxes include all items for a complete installation. These are meter, box and covers, setter, shut_off valve, six (6) feet of service line, corporation stop and the plug and adapter at the end of customers service stub. Additional service line will be paid for under a separate item.

Flush hydrants and air release valves will be paid for under their respective bid price. Excess pipe will be paid under bid price for pipe installed.

Truck loading stations, where required by the plans, shall consist of a complete installation as shown in the Standard Details and will include gate valve, meter, fire hose section, support pipe, fire hydrant, cast iron tee, connecting pipe and any crushed stone or other material incidental to the installation or construction of an approach roadway to the station. The bid price for "truck loading station" shall cover all of this work and material.

**SECTION 02615
UTILITY HORIZONTAL DIRECTIONAL DRILLING**

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. Contractor shall furnish and install pipe by horizontal directional drilling (HDD) construction methods, as shown on the drawings and conform to this specification. The work includes, but is not limited to, excavation, dewatering, removal of all materials encountered in the drilling operations, disposal of all material not required in the work, grouting, bulkheads, testing, cleaning, disinfection, and incidentals, as shown on the drawings and as specified herein.
2. Contractor shall be responsible for the final constructed product, and for furnishing the permits, qualified labor and superintendence necessary for this method of construction.

B. Coordination:

1. Review construction sequencing and installation procedures under other Sections.
2. Contractor responsible to coordinate between other construction contracts that may be on going simultaneously.

C. Related Sections:

1. Section C, Earthwork

1.2 REFERENCES

A. Standards referenced in this Section are listed below:

1. ASTM International.
 - a. ASTM D2321, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications.
 - b. ASTM D2774, Practice for Underground Installation of Thermoplastic Pressure Piping.
 - c. ASTM D3350, Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
 - d. ASTM F-714, Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
2. American Water Works Association
 - a. AWWA C651, Disinfecting Water Mains

1.3 QUALITY ASSURANCE

A. Regulatory Requirements:

1. Comply with requirements and recommendations of authorities having jurisdiction over the Work, including.
 - a. Kentucky Regulatory Authority(s)
 - b. City of Prestonsburg Specifications
 - c. KY DOT ROW permit and other permits deemed necessary by Owner
 - d. Municipal right of way and curb cut permits.
2. Obtain required permits for Work in roads, rights of way, and other areas of the Work, unless otherwise stipulated by Owner.

B. Qualifications:

1. The Contractor or sub-Contractor(s) performing the HDD work shall have a minimum of three (3) continuous years of experience in this field.
2. The Contractor shall have performed a minimum of five (5) directional drill projects of comparable length and diameter.
3. In order to confirm Contractor's qualifications, the Owner reserves the right to require submitted written proof of completed projects. The Contractor's bid may be rejected if the Owner deems these requirements have not been met.

C. All supervisory personnel must be adequately trained in directional drilling.

1.4 SUBMITTALS

A. The Contractor shall prepare and submit for review only, prior to the start of construction, the following:

1. Horizontal Directional Drilling Plan describing the equipment, methods, procedures (pilot hole drilling, insertion, reaming, pullback, coating protection, internal cleaning, internal gauging, hydrostatic tests, dewatering, purging, etc.), monitoring procedures (pressures, depth, alignment, placement, entrance and exit points, etc.), construction sequence and scheduling, contingency plans, and other items of concern to be performed during the horizontal directional drilling process.
2. Project Safety Plan.

B. Quality Control Methods: At least 10 days prior to the start of directional drilling, Contractor(s) shall submit a description of his quality control methods he proposes to use in the directional drilling operations to the Engineer. The submittal shall describe:

1. Procedures for controlling and checking line and grade.
2. Field forms for establishing and checking line and grade.

C. Informational Submittals: Submit the following:

1. Field Quality Control Submittals:
 - a. Results of each specified field quality control test.
2. When requested by Owner or Engineer, submit:
 - a. Information on previous horizontal directional drilling projects, both firm and employees, of similar size, type and complexity.

- b. A list of references of persons or firms who can attest to the quality of performed work.
- D. Closeout Submittals: Submit the following:
 - 1. Boring Path Report:
 - a. Boring path reports are required to be furnished to the Engineer within seven (7) days of the completion of each bore path.
 - b. Include the location of the project, the name of the person collecting data (including title, position, and company name), the identification of the detection method used, and elevations and offset dimensions.
 - 2. Record Documentation:
 - a. Maintain accurate and up-to-date record documents showing modifications made in the field, in accordance with approved submittals, and other Contract modifications relative to buried piping Work. Submittal shall show actual location of all piping Work and appurtenances at same scale as the Drawings. Submittal shall show all bores (successful and failed), final bore path diameter, product diameter, drilling fluid composition, composition of any other materials used to fill the annular void between the bore path and the product.
 - b. Show piping with elevations referenced to Project datum and dimensions from permanent structures. For each horizontal bend in piping, include dimensions to at least three permanent structures, when possible. For straight runs of piping provide offset dimensions as required to document piping location.
 - c. Include profile drawings with buried piping record documents when the Contract Documents include piping profile drawings.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site to ensure uninterrupted progress of the Work.
- B. Contractor shall at all times handle HDPE pipe in a manner that does not over stress the pipe. Vertical and horizontal curves shall be limited so that wall stresses do not exceed 50% of yield stress for flexural bending of the pipe. If the pipe is buckled or otherwise damaged, the damaged section shall be removed and replaced by the Contractor at his expense.
- C. Inspect delivered pipe for cracked, gouged, chipped, dented or other damaged material and immediately remove from site. Sections of pipe with cuts and gouges exceeding 10 percent of the pipe wall thickness or kinked sections shall be removed and the ends rejoined.
- D. Material delivery, storage and handling must conform to requirements in Contract Documents.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General:
 - 1. Materials are defined as pipe or conduit that becomes the installed product. Incidental materials that may or may not be used to install the product depending on field requirements are not paid for separately and will be included in the cost of the installed product.

2. Refer to Division 2 specification sections for pipe material requirements. The material standards noted are to be interpreted as the minimum in place standards, unless noted otherwise in the construction drawings. Use materials that are appropriate for the stresses generated by the selected equipment and field conditions. It is not intended to portray that the use of materials with these minimum material standards will retain their required properties if the stress limits are exceeded for which they were designed during installation. Ensure that the appropriate material is used to retain compliance once it is installed.

B. Equipment Requirements:

1. The Contractor shall ensure that appropriate equipment is provided to facilitate the installation. Equipment shall be matched to the size of pipe being installed and shall have appropriate torque and thrust/pullback capacity for the diameter and length of the intended drilling sections. The Contractor will ensure that the drill rod can meet the bend radius required for the proposed installation.

C. Drilling Fluids:

1. In order to minimize friction and prevent collapse of the bore hole, introduce a soil stabilizing agent (drilling fluid) into the annular bore space from the trailing end of the drill bit. The rotation of the bit in the soil wetted by the drilling fluid creates a slurry. The slurry acts to stabilize the surrounding soil and prevent collapse of the bore hole as well as provides lubrication.
2. Select or design drilling fluids for the site specific soil and ground water conditions.
3. A mixture of bentonite clay or other approved slurry and potable water with a minimum pH of 6.0 shall be used as the cutting and soil stabilization fluid. The viscosity shall be varied to best fit the soil conditions encountered. Water shall be clean and fresh. No other chemicals or polymer surfactant are to be used in the drilling fluid without the written consent of the Engineer and after a determination is made that the chemicals to be added are not harmful or corrosive to the facility and are environmentally safe.
4. The Contractor shall identify the source of fresh water for mixing the drilling mud. The Contractor shall be responsible for approvals and permits required for such sources as streams, rivers, ponds, or fire hydrants. Any water source other than potable water may require a pH Test.
5. Monitoring of the drilling fluids such as the pumping rate, pressures, viscosity, and density is required during the pilot bore, back reaming, and pipe installation stages, to ensure adequate removal of soil cuttings and the stability of the bore hole. Relief holes can be used as necessary to relieve excess pressure down hole. To minimize heaving during pullback, the pull-back rate is determined in order to maximize the removal of soil cuttings without building excess down hole pressure. Excess drilling fluids shall be contained at entry and exit points until they are recycled or removed from the site. Entry and exit pits shall be of sufficient size to contain the expected return of drilling fluids and soil cuttings.
6. Ensure that all drilling fluids are disposed of or recycled in a manner acceptable to the appropriate local, state, or federal regulatory agencies. When drilling in suspected contaminated ground, the drilling fluid shall be tested for contamination and disposed of appropriately. Any excess material shall be removed upon completion of the bore.

7. Restoration for damage caused by heaving, settlement, escaping drilling fluid (fracout) or the directional drilling operation, is the responsibility of the Contractor. Any pavement heaving or settlement damage requires restoration/replacement of the pavement per applicable standards.

D. Buried Piping Identification

1. Refer to applicable Division 2 Sections.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Contractor shall install the pipelines by means of horizontal directional drilling as shown, specified and as recommended by the manufacturer.
2. Contractor shall be responsible for his means and methods of directional drilling construction and shall ensure the safety of the work, the Contractor's employees, the public, and adjacent property, whether public or private.
3. Contractor shall anticipate that portions of the drilled excavation will be below the groundwater table.
4. Contractor shall comply with all local, state, and federal laws, rules, and regulations at all times to prevent pollution of the air, ground, and water.
5. If there is a conflict between manufacturer's recommendations and the Drawings or Specifications, request instructions from Engineer before proceeding.
6. The pipe shall be installed in the location and to the line and grade designated on the drawings.
7. Match equipment to the size of pipe being installed. Ensure that the drill rod can meet the bend radius required for the proposed installation.
8. The timing of all boring processes is critical. Install a product into a bore hole within the same day that the pre-bore is completed to ensure necessary support exists.
9. Provide for testing and cleanup as soon as practicable, so these operations do not lag far behind pipe installation. Perform preliminary cleanup and grading operations immediately after backfilling.
10. All surfaces shall be finish graded to original contours and ground cover.
11. Excavated material, which is not removed from the immediate work site, shall be stockpiled so as to cause as little inconvenience to the property owners as possible. Driveways and street crossings must be kept clear.
12. Carry out excavation for entry, exit, recovery pits, slurry sump pits, or any other excavation. Excavation for entry, recovery pits, slurry sump pits, or any other excavation shall be carried out in accordance with Specification Section 02220 Earthwork.

13. Confine free flowing (escaping) slurry or drilling fluids at the ground surface during pull back or drilling. Accomplish this by creating sump areas or vacuum operations to prevent damage or hazardous conditions in surrounding areas. Sump pits are required to contain drilling fluids if vacuum devices are not operated throughout the drilling operation.
14. Ensure adequate removal of soil cuttings and stability of the bore hole by monitoring the drilling fluids such as the pumping rate, pressures, viscosity and density during the pilot bore, back reaming and pipe installation. Relief holes can be used as necessary to relieve excess pressure down hole. To minimize heaving during pull back, the pull-back rate is determined in order to maximize the removal of soil cuttings without building excess down hole pressure. Contain excess drilling fluids at entry and exit points until they are recycled or removed from the site or vacuumed during drilling operations. Ensure that entry and exit pits are of sufficient size to contain the expected return of drilling fluids and soil cuttings.
15. After completing installation of the product the work site shall be restored. The work site shall be cleaned of all excess slurry left on the ground. Removal and final disposition of excess slurry or spoils as the product is introduced shall be the responsibility of the Contractor.
16. Excavated areas shall be restored in accordance with the Contract Documents. The cost of restoring damaged pavement, curb, sidewalk, driveways, lawns, storm drains, landscape, and other facilities is borne by the Contractor.
17. Contractor shall take responsibility for any damage caused by heaving, settlement, separation of pavement, escaping drilling fluid (frac-out), or the directional drilling operation, at no cost to the Owner. All restoration shall be per the Owner's standards.
18. If an existing marked (or otherwise known) utility is damaged, stop bore immediately and repair at no cost to the Owner.
19. If underground utilities and/or structures not shown on the Drawings are encountered, notify the Owner and do not proceed until instructions are obtained.
20. Notify the Owner if springs or running water are encountered.
21. Provide maintenance of traffic in accordance with the municipal street department, county highway department, or state department of transportation as applicable. Comply with the Manual of Uniform Traffic Control Devices when the former are silent.

B. Utility Verification (Potholing)

1. Contractor shall conduct prior to the start of construction the verification of all underground utilities (potholing) that may conflict with construction. Cost of potholing shall be included in the cost of the pipe installation unit price.
2. Potholing results shall be presented to the Engineer on a full set of drawings showing accurate locations of utilities.
3. Alignment of the proposed utility (horizontal and vertical) may be adjusted in the field upon review of potholing results by the Engineer.
4. All potholes are to be protected and marked so as to not cause injury.

C. Locating and Protecting Sanitary Sewer Laterals.

1. Sanitary sewer laterals are considered “private” and are not part of the public sewer system and begin at the inside face of the public sewer.
2. It shall be the Contractor’s responsibility to pothole and verify the location of the underground utility (sanitary sewer lateral) that may be in conflict with the water main construction.
3. It shall be the Contractor’s responsibility to protect sanitary sewer laterals during all construction activities.
4. Any and all costs associated with locating, protecting, and repairing sanitary sewer laterals shall be considered incidental to the project cost and the responsibility of the Contractor.

D. Drilling Operations:

1. Directional drilling/boring shall use techniques of creating or directing a borehole along a predetermined path to a specified target location. This must involve use of mechanical and hydraulic deviation equipment to change the boring course and must use instrumentation to monitor the location and orientation of the boring head assembly along a predetermined course.
2. Drilling must be accomplished with fluid assisted mechanical cutting. The spoils must be transported from the job site and be properly disposed. Under NO circumstances will the drilling spoils be permitted to be disposed into waterways, sanitary, storm, or any other public or private drainage system.
3. Steering shall be accomplished by the installation of an offset section of drill stem that causes the cutter-head to turn eccentrically about its centerline when it is rotating. When steering adjustments are required, the cutter-head offset section is rotated toward the desired direction of travel and the drill stem is advanced forward without rotation.

E. Locating and Tracking:

1. The Contractor shall at all times provide and maintain instrumentation that will accurately locate the pilot bore/hole and measure drilling fluid flow and pressure.
2. The Contractor shall describe the method of locating and tracking the drill head during the pilot bore. The accepted methods of tracking directional bores are walkover, wire line, and wire line with surface grid verification, or any other system as approved by the Engineer. The locating and tracking system shall be capable of ensuring that the proposed installation is installed as intended. The locating and tracking system shall provide information on:
 - a. Clock and pitch information
 - b. Depth.
 - c. Transmitter temperature.
 - d. Battery status.
 - e. Position (x,y).
 - f. Azimuth, where direct overhead readings (walkover) are not possible (i.e. subaqueous or limited access transportation facility.)
 - g. Alignment readings or plot points shall be taken and recorded such that elevations from the top of and offset dimensions from the center of the product to a permanent fixed feature are provided. Provide elevations and dimensions at all bore alignment corrections (vertical and horizontal) with a minimum distance between points of fifty (50) feet. Provide a sufficient number of elevations and

offset distances to accurately plot the vertical and horizontal alignment of the installed product. Before commencement of a directional drilling operation, proper calibration of the equipment (if required) shall be undertaken.

- Contractor shall provide and grant Engineer access to all data and readout pertaining to the position of the bore head and fluid pressures and flows. No information pertaining to the position or inclination of the pilot bores shall be withheld from the Engineer.
- Install all facilities such that their location can be readily determined by electronic designation after installation. For non-conductive installations, attach a minimum of two separate and continuous conductive tracking (tone wire) materials, either externally, internally or integral with the product. Use a continuous green sheathed solid conductor copper wire line (minimum #10 AWG).
- Connect any break in the conductor line before construction with an electrical clamp, or solder, and coat the connection with a rubber or plastic insulator to maintain the integrity of the connection from corrosion. Clamp connections must be made of brass or copper and of the butt end type with wires secured by compression. Soldered connections must be made by tight spiral winding of each wire around the other with a finished length minimum of 3 inches overlap.
- Test conductors for continuity. Conductors shall be installed to ground level at each hydrant and valve box.

F. Ream and Pullback:

- After an initial bore has been completed, a reamer will be installed at the termination/exit pit and the pipe will be pulled back to the starting/entry pit.
- Reaming operations shall be conducted to enlarge the pilot after acceptance of the pilot bore. The number and size of such reaming operations shall be conducted at the discretion of the Contractor. However, the Contractor shall minimize potential damage from soil displacement / settlement by limiting the ratio of the bore hole to the product size. The size of the back reamer bit or pilot bit, if no back reaming is required, will be limited relative to the product diameter to be installed as follows:

Maximum Pilot or Back-Reamer Bit Diameter When Rotated 360 Degrees	
Nominal Inside Pipe Diameter Inches [mm]	Bit Diameter Inches [mm]
2 [50]	4 [100]
3 [75]	6 [150]
4 [100]	8 [200]
6 [150]	10 [250]
8 [200]	12 [300]
10 [250]	14 [350]
12 [300] and greater	Maximum Product OD plus 6 [150]

imum allowable pull exerted on the HDPE pipelines shall be measured continuously and limited to the maximum allowed by the pipe manufacturer so that the pipe or joints are not over stressed.

- A swivel shall be used to connect the pipeline to the drill pipe to prevent torsional stresses from occurring in the pipe.
- The lead end of the pipe shall be closed during the pullback operation.

6. The pipelines shall be adequately supported by rollers and side booms and monitored during installations so as to prevent over stressing or buckling during the pullback operation.
7. Support/Rollers shall be spaced at a maximum of 60 feet on centers, and the rollers to be comprised of a non-abrasive material arranged in a manner to provide support to the bottom and bottom quarter points of the pipeline allowing for free movement of the pipeline during pullback.

3.2 DRILLING FAILURE

1. If conditions warrant removal of any materials installed in a failed bore path, it will be at no cost to the Owner. Promptly fill all voids by injecting all taken out of service products that have any annular space with excavated flowable fill.
2. No payment will be made for failed bore paths, injection of flowable fill, products taken out of service or incomplete installations.

3.3 WORK AFFECTING EXISTING PIPING

A. Location of Existing Piping:

1. Locations of existing piping shown should be considered approximate.
2. Contractor(s) shall determine the true location of existing piping to which connections are to be made, and location of other facilities which could be disturbed during earthwork operations, or which may be affected by Contractor's Work in any way.

B. Taking Existing Pipelines Out of Service:

1. Do not take pipelines out of service unless approved by Engineer.
2. Notify Engineer, in writing, at least 48 hours prior to taking pipeline out of service.

3.4 QUALITY CONTROL

- A. A representative of the Contractor must be in control of the operation at all times. The representative must have a thorough knowledge of the equipment and the procedures to be performed, and must be present at the job site during the installation.
- B. The Owner must be notified forty-eight (48) hours in advance of starting work. The installation shall not begin until the Owner's representative is present at the job site and agrees that proper preparations have been made.

3.5 TESTING OF PIPING

A. General:

1. Refer to applicable piping installation specification for testing requirements.

2. When there is any indication a pipe has sustained damage and may leak, the work is to be stopped and the damage investigated. The Owner may require a pressure test. The testing may consist of one of the following methods but shall always meet or exceed Owner's testing requirements:
 - a. Manufacturer's pressure testing recommendations for the type of pipe being installed are followed. The Owner's Representative shall be notified and at his/her option be present during the test for review of the test results for compliance. The pressure test shall be performed within twenty-four (24) hours. A copy of the test results shall be furnished to the Owner's Representative. If the pipe is not in compliance with specifications, the City may require it to be filled with flowable fill.
 - b. Product carrier pipes installed without a casing must meet pressure requirements set by the Owner. A copy of the test results shall be furnished to the Owner's Representative. If the pipe is not in compliance with specifications the Owner may require it to be filled with flowable fill.

3.6 CLEANING AND DISINFECTION

A. General:

1. Refer to applicable piping installation specification for cleaning and disinfection requirements.

+ + END OF SECTION + +

SECTION 02616 TRACER WIRE INSTALLATION

GENERAL

This Construction Standard governs trace wire installation on water mains. Trace wire shall be installed on all water mains. **Exception:** Water mains as part of a relocation project shall have trace wire installed:

- If the length of the relocated section is 600' or greater
- The length of the relocated section is between 200' and 600' and includes a valve (including hydrant branch valves)
- The main being relocated currently has trace wire on it
- All relocated PVC and HDPE water mains
- Where called for on project drawings

Typical hydrant branches, that are perpendicular to the water main, do not require trace wire. Trace wire shall be installed on non-typical hydrant branches (i.e. dog-legged hydrant branch).

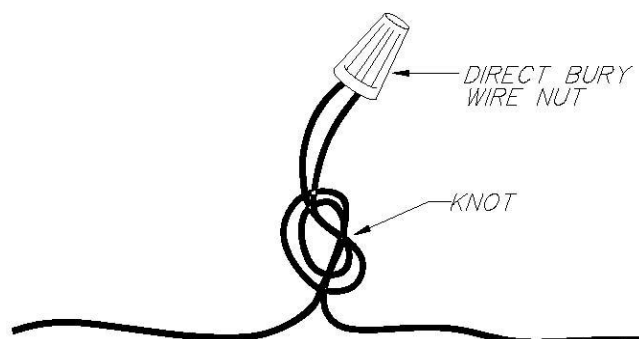
EXTRA TRACE WIRE MATERIAL

- Trace wire shall be #14 AWG Copper Clad Steel wire as manufactured by Copperhead Industries, LLC #14 AWG solid Copper wire with 30 mil high molecular weight polyethylene insulation as manufactured by Agave Wire LTD, or approved equal
- Blue tri-view plastic markers by Rhino w/Test Screws
- 4 ft U-channel posts
- Valve Box Top Sections
- Direct Bury Wire Nuts (Dryconn Direct Bury Wire Nut (10444) manufactured by King Innovation, DBY-6 or DBR-6 as manufactured by 3M or approved equal).
- Direct Bury Lug (Dryconn Direct Bury Lug as manufactured by King Innovation or approved equal).

TRACE WIRE CONNECTIONS

Joining Ends of Trace Wire: Connections into existing trace wire, connections into trace wire used during water main bores, connections between one spool of trace wire to another, and other similar connections shall be made using a direct bury wire nut. When connecting trace wire ends together, strip 5/8" of insulation from the end of each wire. Insert the two ends firmly into the direct bury wire nut. Twist the wire nut clockwise while pushing the wires firmly into the nut. Do not over torque. Tie the wires in a knot as shown in Figure 1.

Figure 1. Direct bury wire nut connection



Joining Trace Wire - Branch to Main: Connections of trace wire at tees, crosses, and at locations where the trace wire will be brought to the surface shall be conducted using a direct bury lug.

INSTALLATION

Trace wire shall be installed in a continuous fashion. Install trace wire on top of water main and secure to main every five (5) feet with tape.

Bring trace wire to surface at every cc box, vault, blue plastic marker with trace wire connectors, dead end hydrants, and as called out in the drawings. Trace wire shall be brought to the surface at least every one thousand (1,000) feet. Take care not to damage the wire coating. Repair damaged coating with electrical tape.

Trace Wire in a Vault

Trace wire shall be brought up in all vaults. Do not wrap the trace wire around the steps or any other place where a person entering the vault could trip on the wire.

Trace Wire in Blue Plastic Pipe Line Marker

When bringing the trace wire up in a blue plastic pipe line marker, install the trace wire according to Figure 2. Bury a four foot u-channel post two feet in the ground. Run the trace wire up through the marker and slide the blue plastic marker over the post. Bury the bottom six inches of the marker. Connect the trace wire to the brass connecting screws and label the screws with a permanent marker as shown in Figure 2. Note location of trace wire pipeline marker on as-built drawings.

Note: *If a marker is used only to mark the main location and not bring up the trace wire, use the blue markers without the trace wire connectors.*

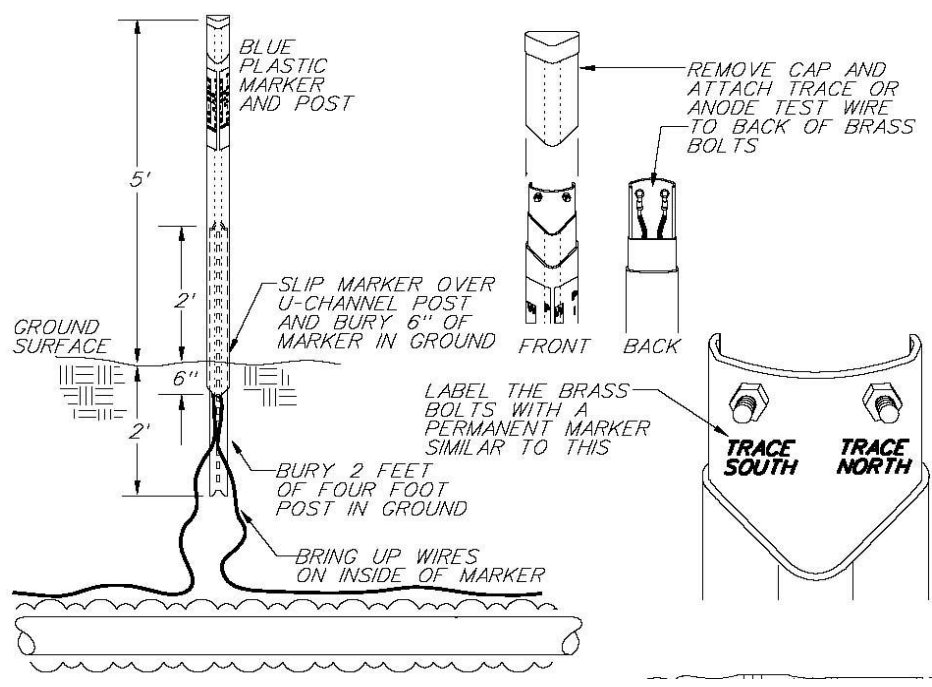
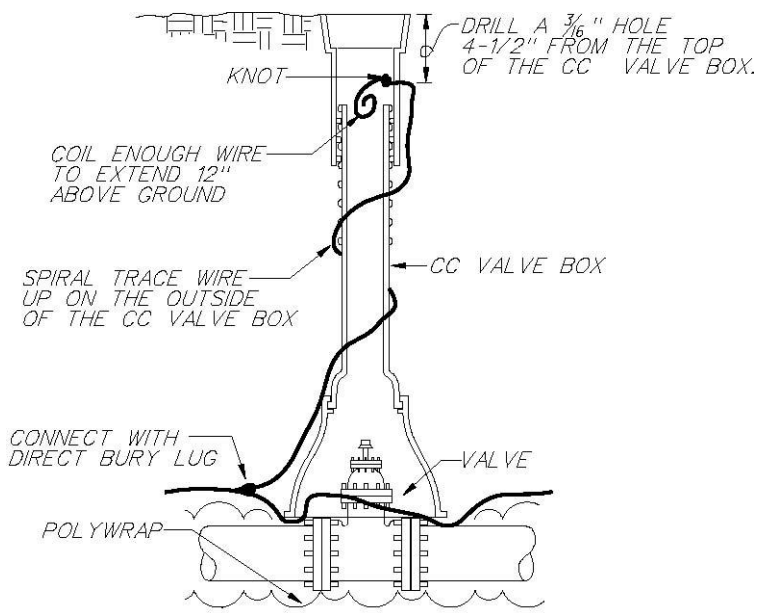


Figure 2. Trace wire access at a pipeline marker.

Trace Wire in a CC Valve Box

Trace wire shall be brought up in all cc valve boxes. The trace wire shall be brought to the surface according to Figure 3.

Figure 3. Trace wire access at a cc valve box.



*** Trace Wire in PVC Conduit at Hydrant**

Trace wire shall be brought up in a PVC conduit at all dead end/end of main fire hydrants without a valve and at hydrants of a non-typical hydrant branch (i.e. dog-legged hydrant branch). Trace wire shall be brought to the surface according to Figure 4. Note location of PVC conduit in relation to the hydrant (i.e. north, east, south or west) on as-built drawings.

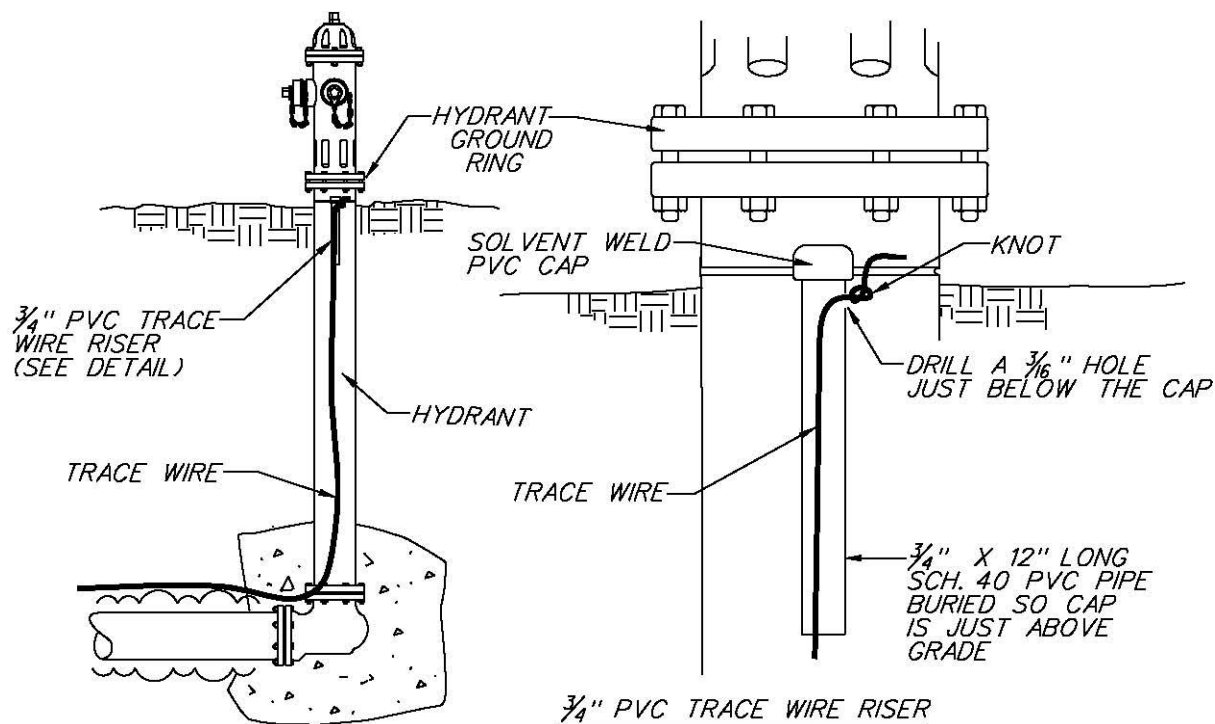


Figure 4. Trace wire access at a hydrant.

* Denotes Change

SECTION 02900 LAWNS AND GRASSES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. Contractor shall provide all labor, materials, tools, equipment and incidentals as shown, specified and required for surface restoration of lawn and turf areas.

B. Coordination:

1. Review installation procedures under other Sections and coordinate the installation of items that must be installed with, or before, lawns and grasses.
2. If applicable notify other contractors in advance of the planting of lawns and grasses to provide them with sufficient time for the installation of items that must be installed with, or before, lawns and grasses.

1.2 RELATED WORK

- A.** Subgrade elevations, excavation, fillings, and grading required to establish elevations shown on Drawings are not specified in this Section. Refer to this Division, Sections 02220 and 02250.
- B.** Erosion and sediment control are included in this Division, Section 02101.

1.3 REFERENCES

A. Standards referenced in this Section are listed below:

1. KYDOT – Kentucky Department of Transportation Standard Specifications.

1.4 DEFINITIONS

- A.** The term “finish grade” shall be used to describe the finished surface elevation of planting soil.
- B.** The term “subgrade” shall be used to describe the surface of subsoil remaining after completing excavation; or the top surface of a fill or backfill immediately beneath topsoil and which has not been tested for acceptable use as topsoil.

1.5 SUBMITTALS

A. Action Submittals: Submit the following:

1. Product Data:
 - a. Seed Mixture for each type of seed and each seed lot.
 - b. Certifications from manufacturers that materials provided meet specs.

1.6 PROJECT CONDITIONS

A. Environmental Requirements:

1. Proceed with and complete lawn and grass planting as rapidly as portions of the Site become available, working within the seasonal limitations for each type of lawn and grass planting required.
2. Proceed with planting only when current and forecasted weather conditions are favorable to successful planting and establishment of lawns and grasses.
 - a. Do not spread seed when wind velocity exceeds five miles per hour.
 - b. Do not plant when drought, or excessive moisture, or other unsatisfactory conditions prevail.
3. Begin maintenance immediately after each area is planted and continue until acceptable growth is established.
4. Herbicides, chemicals and insecticides shall not be used on areas bordering wetlands.

B. Scheduling:

1. Plant during one of the following periods:
 - a. Spring Planting: March 1 to June 1.
 - b. Fall Planting: August 15 to October 30.
 - c. During other periods, the time of planting shall be determined by the Engineer.

C. Water & irrigate lawn and grass plantings as required to obtain adequate establishment of lawns and grasses.

1.7 WARRANTY

- A. General Warranty: The special warranties specified in this Article shall not deprive Owner of other rights or remedies Owner may otherwise have under the Contract Documents and shall be in addition to, and run concurrent with, other warranties required by Contractor under the Contract Documents.
- B. Special Warranties: The Contractor shall guarantee a good stand of grass in seeded areas by watering, regrading and reseeding eroded areas and otherwise maintaining all seeded areas until final acceptance. Any areas which do not show a uniform stand or have bare spots shall be reseeded and re-mulched at the Contractor's expense with the same seed mixture and mulch as originally used thereon and such reseeding and re-mulching shall be repeated until all affected areas are covered with grass. Final acceptance of all lawn areas may be required by the Contractor after 60 days from the date of installation. The above does not release the Contractor from the standard provisions included in the Guaranty or Maintenance bond agreement.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil:

1. Seeding / Sodding: KYDOT or approved equal.
2. Topsoil Source: Reuse surface soil stockpiled on-site, where possible. Verify suitability of stockpiled surface soil to produce topsoil, as specified. If not suitable amend topsoil to meet

requirements approved by the Engineer. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

- a. Supplement acceptable on-site soil with manufactured topsoil from off-site sources, when quantities available on-site are insufficient to complete the Work.

B. General Purpose / Right of Way Seed:

1. Lawn Grass Seed Mixture: Provide fresh, clean, new-crop seed complying with the tolerance for purity and germination established by KYDOT. Provide seed of the grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, specified.
2. Seed Species: The general purpose mixture shall be "Seed Mixture R" in accordance with KYDOT. or approved equal.

C. Project Site Lawn Areas: Proportioned by weight as follows:

1. 70% Turf Type Tall Fescue (3 Varieties)
2. 20% Perennial Ryegrass (2 Varieties)
3. 10% Kentucky Bluegrass (1 Varieties)
 - a. Sow seed at a rate of 425 lbs/acre. Contractor(s) shall submit grass seed varieties to the Engineer/Architect for approval before planting begins.

D. Fertilizers:

1. Provide commercial grade complete fertilizer of neutral character, consisting of fast- and slow release nitrogen with an analysis of 12-12-12, in accordance with Kentucky Department of Transportation Standard Specification.

E. Mulches:

1. Provide air-dry, clean, mildew- and certified seed and weed free, mulch. Mulch may consist of straw, excelsior mulch, wood cellulose fiber mulch, excelsior blanket, paper mat or straw mat, in accordance with Kentucky Department of Transportation Standard Specification.

F. Water:

1. Provide water acceptable for lawn and meadow application and containing no material harmful to plant growth and establishment and in accordance with Kentucky Department of Transportation Standard Specification.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Contractor shall examine the areas and conditions under which lawn and meadow Work is to be performed, and notify Engineer, in writing, of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to Engineer.

3.2 PREPARATION

- A. Excavate or fill subgrade, as required, to bring subgrade to elevations shown. Maintain all angles of repose. Confirm that subgrade is at proper elevations and that no further earthwork is required to bring the subgrade to proper elevations. Provide subgrade elevations that slope parallel to finished grade and towards subsurface drains shown.
- B. Remove all construction debris, trash, rubble and all extraneous materials from subgrade. In the event that fuels, oils, concrete washout or other material harmful to plant growth or germination have been spilled into the subgrade, excavate the subgrade sufficiently to remove all such harmful materials and fill with approved fill, compacted to the required subgrade compaction level.

3.3 FINE GRADING

- A. Immediately prior to dumping and spreading topsoil, clean subgrade of all stones greater than 2-inches and all other extraneous matter. Remove all such material from Site. Notify Engineer that subgrade has been cleaned, and obtain approval prior to spreading topsoil.
- B. Do not attempt to spread excessively wet, muddy or frozen topsoil. Do not spread topsoil more than five days before seeding or planting.
- C. Spread topsoil to a depth of 4-inches but not less than required to meet finish grades after light rolling and natural settlement.
- D. The area to be seeded shall be made smooth and uniform and shall conform with the finished grade and cross section shown on the plans or as directed by the Engineer. It shall have been given final trimming.
- E. Moisten prepared areas before seeding or sodding. Water thoroughly and allow surface moisture to dry before planting. Do not create a muddy condition.
- F. Fertilize, seed, and mulch per KYDOT.
- G. Reseed areas that remain without mulch for longer than three days.
- H. Take precautions to prevent damage or staining of construction or other plantings adjacent to mulched areas. Immediately clean damaged or stained areas.
- I. Prevent foot or vehicular traffic, or the movement of equipment, over the mulched areas. Reseed areas damaged as a result of such activity.

3.4 RECONDITIONING EXISTING LAWNS AND GRASS AREAS

- A. Recondition existing lawn damaged by Contractor's operations, including areas used for storage of materials or equipment and areas damaged by movement of vehicles. Recondition existing lawn and grass areas where minor regrading is required.
- B. Recondition other existing lawn and grass areas shown.
- C. Provide fertilizer, seed or sod and soil amendments, as specified for new lawns and grass areas, and as required to provide satisfactorily reconditioned lawns and grass areas. Provide new topsoil as required to fill low spots and meet new finish grades.
- D. Till stripped, bare, and compacted areas thoroughly to a depth of 12-inches.

- E. Remove diseased or unsatisfactory lawn and grass areas; do not bury into soil. Remove topsoil containing extraneous materials resulting from Contractor's operations including oil drippings, stone, gravel and other construction materials.
- F. In areas approved by Engineer, where substantial lawns and grass areas remain (but are thin), mow, dethatch, core aerate and rake. Fill low spots, remove humps, cultivate soil, fertilize, and seed. Remove weeds before seeding or if extensive, apply selective chemical weed killers, as required. Apply a seedbed mulch, if required, to maintain moist condition.
- G. Water newly planted areas & keep moist until new lawns are established, as specified.

3.5 ACCEPTANCE CRITERIA FOR LAWNS AND GRASS AREAS

- A. Lawn and grass Work will be considered acceptable when:
 - 1. Seeded Lawn: When a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. feet and bare spots not exceeding 5-inches by 5-inches.

3.6 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris, created by lawn and grass Work, from paved areas. Clean wheels of vehicles before leaving Site to avoid tracking soil and topsoil onto roads, walks, or other paved areas.
- B. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout extended service period and remove when service period ends. Treat, repair or replace damaged lawns and meadows.
- C. Remove erosion-control measures after lawn and grass meadow extended service period ends.

3.7 INSPECTION AND ACCEPTANCE

- A. Where lawns and grass areas do not comply with specified acceptance criteria, reestablish lawns and grasses and continue extended service period until lawns and meadows comply with criteria for acceptance.

+ + END OF SECTION + +

SECTION 15100
VALVES, METERS, HYDRANTS, AND FLUID TRANSPORT APPURTENANCES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Valves, meters, hydrants, and other appurtenances for fluid transport systems as identified on the contract Documents.
- B. See the valve schedule as included on the contract drawings, and associated notes.

1.2 COORDINATION:

- A. Review installation procedures for this and other specification sections and coordinate Work that must be installed with or before Work under this Section.

1.3 QUALITY ASSURANCE

- A. Responsibility: The valve manufacturer shall be responsible for compatibility and the required performance of valves and operators. Wherever possible, valves and operators shall be delivered as a complete assembly.
- B. Manufacturer's Qualifications:
 - 1. If requested, manufacturer shall be able to provide documentation of at least five installations of substantially similar products to that specified, in satisfactory service for at least five years.
- C. Component Supply and Compatibility:
 - 1. Specified appurtenances of each type shall be furnished by a single manufacturer.
- D. Regulatory Requirements:
 - 1. Drinking Water Requirements: Valves that will be in contact with potable water or water that will be treated to become potable shall comply with ANSI/NSF 61 and the Safe Drinking Water Act.

1.4 SUBMITTALS

- A. Shop Drawings and Product Data: Submit Shop Drawings and product data in compliance with Section 01300 for all valves, hydrants, valve operators, floor boxes, and other appurtenances showing general dimensions, construction details and full descriptive literature which includes materials of construction, material specification and grade and indicating all valve parts. Shop Drawings shall indicate valve operator locations.
- B. For check valves, indicate valve dimensions including lay lengths and counterweights. Indicate orientation of counterweights.
- C. Indicate valve linings and coatings. Submit Manufacturer's catalog data.

- D. Certifications:
 - 1. Valve Manufacturer shall furnish certification that each valve has been subjected to a hydrostatic water pressure twice the pressure class and that each valve is free of defects. Valves shall be tested in both the open and closed positions.
 - 2. Submit documentation from the manufacturer of each product stating that product conforms to applicable referenced standards and specified requirements.
- E. Special Tools: Furnish one set of all special tools necessary for installation, normal maintenance, and adjustment.
- F. Operation and Maintenance Manuals: Submit operation and maintenance instruction bulletins for all valves, hydrants, and valve operators in compliance with Section 01300.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with the manufacturer for special handling and storage requirements.
- B. Conform to requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 SERVICE CONDITIONS

- A. General:
 - 1. Appurtenances shall be suited for services intended.
 - 2. Water appurtenances that will be in contact with potable water shall be listed in ANSI/NSF 61 as being suitable for contact with potable water.

2.2 GENERAL

- A. All valves shall be of standard manufacture and of highest quality materials and workmanship.
- B. All valves of a particular type shall be the product of one Manufacturer regularly engaged in the continuous production of that size and type of valve.
- C. Valves shall be suitable for working pressure as required and as specified for the pipelines in which they are installed. Manufacturer's name, service, and pressure class shall be cast into the body.
- D. Unless otherwise indicated or specified, all valves 2 inches and smaller shall be all brass or bronze; valves over 2 inches shall be iron body, fully bronze, or bronze mounted.
- E. Where required for satisfactory operation of valves, provide valve operators, extension stems, stem guides, cast iron valve boxes, floor boxes, chain wheel with chain, handwheels, operator floor stands, position indicators, and other valve appurtenances. All manual valve operators located 6 feet or greater above the floor shall be provided with a chain wheel with chain unless otherwise noted. Extension stems shall be complete with guide bearings, wrench nut, and tee handle wrench. All machinery stuffing boxes shall be packed with material selected for the

service intended. Maintain all packing until final acceptance by the OWNER. Valve operator location shall be as required for easy access and operation and shall be subject to approval by the OWNER.

- F. Buried valves shall be epoxy coated. Exposed valves shall be painted in compliance with Section 09900.

2.3 PRESSURE GAUGE

- A. Pressure gauges shall be installed where indicated in the Contract Documents.
- B. Pressure gauges shall be liquid filled direct reading 4-½ inch dial with a ½-inch connection. All gauges shall include an oil isolation diaphragm for isolation of the gauge from the wastewater. Gauge connection ports shall be included on all pump discharge mains and suction lines. The connection port shall include a coated service saddle or welded thread-o-let for tapping of the main, Type 316 stainless steel nipples, a stainless steel spring return ball valve to the closed position, and a ½-inch Swagelok "QF" series female NPT stem with protector cap, or approved equal.
- C. The exact final location and orientation of all pressure gages shall be approved by the Owner prior to construction.

2.4 RESILIENT GATE VALVE

- A. Resilient seat gate valves shall be manufactured by M&H Valve Co., Clow, Waterous, American, Mueller, or equal.
- B. Gate valves two and one-half inches and smaller: gate valves 2-1/2 inches and smaller shall conform to MSS SP-80; Class 125, body and bonnet of ASTM B62 cast bronze; with threaded or solder ends, solid disc, copper-silicon alloy stem, brass packing gland, "Teflon" impregnated packing and malleable iron handwheel. Provide Class 150 valves meeting above where system pressure requires.
- C. All valves three inches or larger shall be resilient wedge gate valves with cast or ductile iron body, fully bronze mounted, non-rising stem with upper and lower thrust collars, and two inch (2") operating nut. Waterways shall be smooth. Gate valves shall be furnished with O-ring stem seals. Number, size and design shall conform to the AWWA Standard for R/W Valve O-ring stem seals. All valves shall open by turning counterclockwise. **Contractor shall verify direction of opening with Town prior to ordering.** Valves shall meet or exceed AWWA C-509 or C-515. Valves shall be designed for a working pressure of 200 psi. Valves shall be fusion-bonded epoxy coated lined interior and exterior. Fusion-bonded epoxy coating shall comply with AWWA C550.
- D. The materials of construction shall be: body cover and bonnet of cast or ductile iron; stem end wedge nut of bronze; resilient wedge of ductile iron coated with EPDM rubber.

2.5 KNIFE GATE VALVE

- A. Knife gate valves shall be standard type. Valves shall be suitable for use in raw sewage. Valves greater than 8 inches require a handwheel, otherwise use lever actuator. Provide bevel gear actuators for valves 14 inches and larger. Knife gate valve shall be by De Zurik, Series "GKU", Orbinox, Series "20", or equal with through bolting flange wafer style. Type 304 stainless steel

body liner, square braided PTFE impregnated synthetic fiber packing, and chloroprene or Nitrile/Buna seat material. Valves located in corrosive environments shall have type 316 stainless steel body liner.

- B. Chainwheel type operators shall be provided for all valves which are located 6 feet or more above the floor and which are not required to be equipped with other types of operators. Each chainwheel operated valve shall be equipped with a chain guide which will permit rapid handling of the operating chain without "gagging" of the wheel and will also permit reasonable side pull on the chain. Operating chains shall be heavily plated with zinc or cadmium and shall be looped to extend to within 4 feet of the floor below the valve. Chains obstructing walkways shall be hung on an adjacent wall when not in use.
- C. Dual seated, bi-directional knife gate valves shall be Red Valve series DX, Orbinox Series 22, or equal.

2.6 HORIZONTAL SWING CHECK VALVE

- A. Horizontal swing check valves with rubber-faced flanged ends shall be manufactured by Val-Matic, GA Industries GA Figure 250-DS, or equal.
- B. Horizontal swing check valves shall be of the horizontal, single disc, swing type designed to allow a full diameter passage and to operate with a minimum loss of pressure. Check valves 1/8 through 3 inches shall meet the requirements of Fed. Spec. WW-V-51. Except as specified herein, check valves 4-inches through 24-inches shall meet the requirements of AWWA C508.
- C. Valves shall be iron body with the following materials of construction:

Item	Material	Specification
Body, Cover, Disc, Lever Arm	Ductile Iron or Cast Iron	ASTM A126, Class B ASTM A536 Gr 65-45-12
Disc Arm	Ductile Iron or Cast Iron	ASTM A536 or ASTM A126, Class B
Seat	Stainless Steel or Bronze	ASTM B148 or B62 or ASTM A276, Type 304
Disc Seat	Buna N	
Hinge Shaft Cushion Cylinder	Stainless Steel or Bronze	Type 303, 304, or 410 ASTM B148 or B62 or Type 316

- D. The valve shall permit flow in only one direction, close tightly when the discharge pressure exceeds the inlet pressure, and shall close without a slam or hammering action. All internal parts, including the disc seat, shall be easily replaced in the field without removing the valve from the pipeline.
- E. Valve ends shall be flanged ANSI A21.10/AWWA C110. Minimum working differential pressure across the disc shall be 150 psi.

- F. Valves shall be coated with fusion bonded epoxy coating on interior and exterior, minimum 10 mils.
- G. Valves at discharge of sludge pumps in Solids Processing Building shall be unweighted, non-spring type.
- H. Val-Matic Surgebuster check valve is an acceptable alternate as described below.

Valve shall feature non-slamming characteristics via disc memory and 35° short disc stroke. Valve body and cover shall be Ductile Iron with Stainless Steel Disc Accelerator. Disc shall be Buna-N with steel reinforcement and Nylon reinforced hinge. Valve to include 25 Year warranty on flex portion of the disc. Valves shall be coated with Fusion bonded epoxy coating on interior and exterior, min 10 mils.

2.7 ECCENTRIC PLUG VALVE

- A. Plug valves shall be by Val-Matic Model 5600 Series, GA Industries ECO-Centric, or equal.
- B. Eccentric plug valves shall be non-lubricated type, have fully encapsulated plugs and shall be of eccentric construction. Valves shall be made of cast iron or semi-steel at least equal to ASTM A126, Class B. Body seats of valves 3-inch and larger shall have a welded-in overlay of not less than 90 percent pure nickel on all surfaces contacting the plug face. Stem bearings shall be of corrosion-resistant material. Port areas, except for 1-inch valves, shall be equal to at least 100% of the full pipe area. Valves 4-inch and larger shall have adjustable packing glands and shall be capable of being repacked without the bonnet or plug being removed from the valve. The valve shall be designed to withstand full operating pressure against the face of the plug without leakage. Valves shall be designed for not less than 100 pounds cold water, oil or gas operating pressure, and shall be gear operated, unless otherwise shown or specified. Gear-operated valves with operating wheels 6 feet or more above the floor shall be provided with chains and chain wheels. One wrench shall be furnished for each size valve in each individual room or operating space in which valves are located. Non-full-port valves will not be allowed.
- C. Plug valves located underground shall have mechanical joint pipe connections at both ends.
- D. Plug valves used for air service shall have EPDM rubber rated to 250 degrees F (CRINRB =180 F).
- A. Valves shall be satisfactory for applications involving throttling service as well as frequent or infrequent on-off service. The valve closing member should rotate approximately 90 degrees from the full-open to full-close position and vice-versa.
- B. Valves 4 inches thru 6 inches in size shall have a two (2) inch operating nut while eight (8) inch and larger valves shall be provided with a 2 inch operating nut on the worm gear operating mechanism.
- C. Valves up to 12-inch shall have 175 psi working pressure, valves larger than 12-inch shall have 150 psi working pressure, unless otherwise noted on the Drawings.
- D. All valves shall be supplied with a posi-cap alignment device. Provide valve nut extension if valve is installed deeper than 60" cover.
- E. Valves shall be coated with fusion bonded epoxy coating on interior and exterior, 6 mils min.

2.8 BUTTERFLY VALVE

- A. Butterfly valves shall be of the short body rubber seated type, conforming to the latest revision of AWWA C504. Valves shall be bubble tight at the rated pressure and shall be suitable for both throttling and on/off isolation service. Valve to be NSF-61 approved. Valve shall be Val-Matic 2000 Series, DeZurik style BAW, or equal.
- B. Valve body shall be of cast iron construction to ASTM A126 Class B or ductile iron construction to ASTM A536 Grade 65-45-12. Valve discs shall be of ductile iron, ASTM A536 Grade 65-45-12 or cast iron ASTM A48 Class 40C with stainless steel seating edge. Above ground valves 20" and smaller shall be flanged with drillings conforming to ANSI B16.1 Class 125. Above ground valves 24" and larger shall be flanged with drillings conforming to ANSI B16.1 Class 250. Below ground valves shall be provided with mechanical joint ends. Valve shafts shall be of solid 304, 316, or 630 stainless steel corresponding to the design requirements of the latest revision of AWWA C504. The shafts shall be fastened to the disc by a means designed to provide vibration-proof connection.
- C. Valve shall be seat on disc type. Seats and shaft packing shall be of Buna-N/NBR/EPDM. Seats to be fully adjustable in all sizes.
- D. Shaft bearings shall be of the self-lubricating corrosion resistant sleeve type designed for both horizontal and vertical shaft loading. Buried actuators shall be grease filled per AWWA C504.
- E. Valves shall be hydrostatically tested for bubble tight shut-off in accordance with the latest revision of AWWA C504.
- F. All materials, coatings and lubricants to be suitable for potable and non-potable water or wastewater applications.
- G. Valve to be interior / exterior epoxy coated per AWWA C550.
- H. Unless otherwise indicated, valves shall be provided with handwheel operated reducing gear actuators with external stops, suitably selected for the torque requirements of AWWA valve class.
- I. Valve shall have an arrow cast into the handwheel with the word "OPEN" in a prominent location, readily visible to the operator, indicating the correct rotation of the crank to open (counter clockwise). Provide properly sized handwheels to suit the size of the valve, having a diameter of not less than 9.5 inches in diameter. Provide for larger handwheels on valves greater than 36 inches in diameter.
- J. Butterfly valves for air service shall be provided with EPDM rubber seats rated to 250 degrees F (CRINRB = 180 F). Air butterfly valves 8" diameter and small shall be provided with lockable handles for fluid throttling. Approved manufacturer for air service butterfly valves shall be Val-Matic 2000 Series, DeZurik style BAW, or equal.

2.9 ELECTRICAL MOTOR OPERATED PINCH VALVES

- A. Valves shall be of full cast metal body mechanical pinch type with integral flanges on body and flexible sleeve. Valve shall be full round full port dual pinch on center-line capable of passing a sphere equal to the diameter of the mating pipe. All internal metal parts are to be isolated from the process fluid by the flexible rubber sleeve. Note: The valve is to be provided on this project for control of the WAS on the WAS return line; See Sheet M-15. The valve is 6" in size.

- B. The rubber sleeve shall be compression molded to insure consistent wall thickness and delamination resistance. Rubber sleeve shall be reinforced with polyester fabric or nylon cords. The rubber sleeve shall be provided with Positive Opening Tabs to insure full opening after the valve has been closed for extended periods of time; tabs shall be fastened directly to the pinch bar with bolts and nuts.
- C. Port areas shall be 100% and capable of passing a solid sphere equal to the nominal valve size.
- D. Valve housing shall be cast iron ASTM #A-126 CL-35, with flanges drilled to ANSI B16.1 Class 125 standard. Flanges shall have through holes and shall accommodate a standard hex nut per ANSI B18.2.2; tapped flanges are not acceptable. All bolts used in valve assembly shall be ASTM A 108 grade B5, zinc plated, 80,000 psi min yield / 100,000 psi min tensile strength. Valve shall be painted per Steel Structures Painting Council Standard #SSPC-SP1-G3 with (2) coats of black interior/exterior Alkyd Enamel to a total thickness of 5 mils minimum
- E. Stem shall be 303-stainless steel with Acme Class 2G left hand threads. To prevent galling, the stem shall be driven by a bronze alloy ASTM # B 148-65 9B drive nut. To prevent binding in the event of a sleeve failure, the stem threads shall always remain outside the valve bonnet assembly, and shall be completely isolated from the process fluid, even if the sleeve fails.
- F. Full round port dual pinch mechanism valves shall be ONYX Series DEC with modulating electric motor or Series 5400 by Red Valve.
- G. Valve shall be operated by a self contained electric actuator of the non-intrusive design to accept a 3-phase power supply of 460 volts and rated NEMA 4, 4X, NEMA 6 and submersible to Standard IP68. Integral controls for the actuator shall include Solid State reversing contactors and local controls consisting of a padlockable local/off/remote selector switch, open/stop/close selector and viewing screen with position indication and program display. An absolute encoder shall enable for actuator to achieve 100% repeatable control and provide accurate sensing of valve position without the aid of a battery back-up in the event the valve is cycled manually during a power loss. MX-Q power transfer will continue to power the LCD screen and status function at a remote control room. An auxiliary hand wheel with de-clutch lever shall be included for manual operation.
- H. Valve actuator shall be Limitorque Series MX, or approved equal.
- I. Note: All electrical conduit, wiring and cable plus control wiring, conduit and controls shall be provided to make this system fully functional as intended by the Engineer. The system shall be integrated with the SCADA.

2.10 MANUALLY OPERATED PINCH VALVE

- A. Valves are to be of the full cast metal body, mechanical pinch type with flange joint ends on both the body and the sleeve trim. The valve shall have face to face dimensions of standard gate valves, in accordance with ANSI B16.10 up to 12" size. Sizes 14" and larger shall have a face to face dimension no longer than twice the nominal valve port diameter. The flanges shall be drilled to mate with ANSI B16.1, Class 125 / ANSI B16.5, Class 150 flanges.
- B. The sleeve trim shall be one piece construction with integral flanges drilled to be retained by the flange bolts. The sleeve trim shall be reinforced with calendared nylon or calendared polyester fabric to match service conditions. The sleeve trim shall be connected to the pinch bar by tabs imbedded in the sleeve trim-reinforcing ply. All internal valve metal parts are to be completely isolated from the process fluid by the sleeve trim.

- C. For full port and reduced port sleeves, the port areas shall be 100% of the full pipe area at the valve ends. For Cone and Variable Orifice sleeves the inlet port area shall be 100% of the full pipe area, reducing to a smaller port at the outlet.
- D. The steel mechanism shall be double acting with pinching of the sleeve trim occurring equally from two sides. ACME threads shall be used on all valve mechanisms. There shall be no cast parts in the operating mechanism. The stem shall be non-rising and have a non-rising handwheel. The handwheel shall be constructed of welded, tubular steel and be connected to the stem by means of a single retaining bolt. The handwheel shall be fitted with a lubrication fitting to allow lubrication of the stem. A valve position indicator rod shall pass through the center of the stem, retaining bolt, and handwheel to provide visual position indication. Bevel gear operators shall be provided on all valves over 8" size. Lifting eyelets shall be provided on the top of the valve body where applicable.
- E. Rotating the handle clockwise lowers a pinch bar above the sleeve, while raising a pinch bar below the sleeve simultaneously, pinching the sleeve closed at the center of the valve. Turning the handle counter-clockwise separates the two pinch bars to open the valve.
- F. All valves shall be of the Series 75 as manufactured by the Red Valve Co., Inc., of Carnegie, Pennsylvania, or approved equal.

2.11 PINCH CHECK VALVE

- A. Valve shall be capable of allowing maximum outflow under submerged discharge conditions. Specifically, valve must have less than 1 ft. headloss under 5 psi backpressure at under the Average Daily Flow. Backflow preventing check valve shall be Red Valve Tideflex Series 35, or equal. In locations where a protruding check valve will not fit, Red Valve Series 37G with wall/pipe thimble will be acceptable.
- B. Valve shall be constructed of EPDM rubber with 316 stainless steel mounting bands. For flange mounted valves, flanges shall be constructed of EPDM and have 316 stainless steel backup flanges. All bolts and hardware shall be 316 stainless steel.
- C. Valves 18" diameter and larger shall have a curved bill design.

2.12 NON-METALLIC BALL VALVES

- A. Ball valves shall have double union ends to permit removal of the valve without disconnecting the pipeline and shall be of the type which will not leak when the downstream union end is disconnected.
- B. Viton "O" ring seals shall be used with Teflon seats. Ball valves shall be installed with the flow arrow pointed in the direction of flow to permit disconnection of downstream piping.
- C. During installation, the valve handle shall be oriented for ease of operation by rotating the valve body about its axis prior to tightening the ends.
- D. Where indicated on the Drawings, the valve shall be equipped with a pointer and scale plate which will indicate the position of the valve at all times.
- E. Valve shall be rated for 150 psi pressure and certified for exposure to sunlight.

2.13 DUCTILE IRON BALL VALVES

- A. Ball valves shall be of the floating-ball design capable of providing bi-directional, tight shutoff in accordance with MSS SP-72. The valves shall be rated at 150 # WSP / 300# WOG.
- B. Bodies shall be ductile iron per ASTM A536, with ANSI Class 150 raised-face flanges. The interior and exterior of the body shall be epoxy-coated. Non-flanged valves may be submitted to the Engineer for review and approval, at Engineer's discretion.
- C. The ball shall be PFA infused stainless steel with a stainless steel blowout-proof stem. The seats and body seals shall be PTFE. The stem seal shall be PTFE, externally adjustable chevron type.
- D. Valves shall be equipped with locking handles as standard. If service conditions require, valves may be equipped with 2" square operating nuts, manual gear operators, or pneumatic, electric, or hydraulic actuators.
- E. Valves shall be the Series 4000D as manufactured by American Valve, Inc., or as approved by the Engineer.

2.14 TELESCOPING VALVE

- A. General: This section covers telescoping valves used primarily for sludge removal or liquid level control, and are considered to be fully opened when in the lowermost position. The valve tube travels inside a ductile iron riser pipe as shown on the plan drawings. Unless noted otherwise, the nominal riser pipe diameter determines the valve tube diameter.
- B. Approved Manufacturers: Telescoping valves supplied under this section shall be WACO Products, Inc. Series 2000, Golden Harvest, Inc. Model GH-900, or Engineer approved equal.
- C. Quality Assurance: The manufacturer shall have 5 years experience in the production of substantially similar equipment, and shall show evidence of satisfactory operation in at least 10 installations.

Valves shall be furnished with all necessary accessories and parts for a complete installation and shall be the latest standard product of a manufacturer regularly engaged in the production of equipment of this type. All telescopic valves and their operators shall be furnished by the same manufacturer.

Except as otherwise indicated by this specification, all telescopic valves will be designed and manufactured to meet or exceed all specified criteria defining loading calculations, structural strength, deflection requirements, and material specifications including minimum dimensions.

- D. Slip tube: Tubes for telescoping valves shall be manufactured from minimum 1/8" wall thickness 304 stainless steel in either rolled smooth seam welded tubing or standard schedule pipe. The slip tube shall be accurately formed and finished to assure a smooth leak resistant fit with the valve gasket. Lifting bails shall be manufactured from the same alloy as the slip tube and shall be bolted to the slip tube and provide a connection for the lifting stem. The slip tube shall extend a minimum of 6" into the riser pipe when the valve is in the fully closed position and shall have UHMW spacers at the bottom of the tube to prevent metal to metal contact between the riser pipe and slip tube and to minimize tube misalignment during operation. Travel shall be as indicated on the plan drawings. A pair of 90 degree V-notches, a flared top, or baffle top construction will be provided if shown on the plan drawings.

- E. Operator: All operators shall be “self-locking” and shall not require a separate locking mechanism to hold the valve or valve stem in place after adjustments. The operator will be a rising stem horizontal handwheel type, mounted on a pedestal unless otherwise specified. The bronze operating nut of the operator will be accurately machined to match the thread of the rising stem. Non-rising stems shall not be acceptable unless available space requirements preclude usage of rising stems. The operating nut shall be supported by regreasable ball or roller thrust bearings top and bottom, secured in an accurately machined cast aluminum or iron housing bolted to operator support pedestal. Rack and pinion type operators or operators that use solid plastic thrust bearings are not acceptable.

Where torque, operation or space requirements dictate, bevel gear boxes with either a handcrank or handwheel shall be supplied in lieu of the standard operator. Bevel gear boxes shall have stainless steel input and/or output shafts, accurately machined gears supported by ball or roller bearings secured in an accurately machined cast aluminum or iron housing bolted to the operator support pedestal.

Regardless of the type of operator used to meet the specification, an anti-rotation mechanism shall be incorporated into the operator and stem system to prevent rotation of the tube within the seal assembly. The required effort on the handwheel or crank is to be limited to a maximum 40 lb. pull. The lift mechanism will be capable of withstanding an effort of up to 200 lbs. without damage to the operator, stem or telescopic valve. Manually operated telescopic valves are to be supplied with adjustable stop collars as required to set the valve opening range and to prevent over-travel in either direction.

Optional Electric Actuator: If indicated on the plan drawings (or valve actuator schedule if applicable), the telescopic valve will be provided with an electric multi-turn operator incorporating integral limit switches to stop the telescopic tube in the desired full open and closed positions. The operator will also have a torque limit switch and stop collars as required to prevent damage to an obstructed telescopic valve. Operators can be specified for modulating function where required to maximize level or flow control. Electric operators shall be in accordance with ANSI/AWWA C540 “Standard for Power-Actuating Devices for Valves and Slide Gates”.

- F. Operator stem: Stem shall be minimum 1½” diameter stainless steel rod of the same alloy as the slip tube. Stem shall be designed for a safety factor of 2 based on a critical buckling compressive load calculated by the Euler Column formula where C=2 and assuming a 50 lb effort on the operator.

Stem guides will be supplied to support the stem as required to meet the stem design criteria and shall be fabricated of the same alloy material as the tube. Stem guides shall be adjustable in multiple dimensions to allow for alignment with operator and valve stem nut. Guides will be mounted on the installation wall(s) as required to support and align the stem properly.

- G. Position indicator: Valve position for rising stem operators shall be indicated the top of the valve stem within a clear polymer stem cover tube with an indicator tape graduated in inches and quarter inches. Stem cover tube shall be UV resistant and warranted not to discolor within 5 years of installation. Indicator tape shall be field applied so that zero point is accurate to final installation elevations.
- H. Operator support pedestal: The pedestal and wall bracket (where shown) shall be made of the same alloy material as the slip tube. Painted steel or cast iron construction is not acceptable. Pedestal shall be mounted to the concrete floor slab or mounted on a wall bracket as shown on the plan drawings and per manufacturer recommendations.

The pedestal shall be capable of supporting all loads imparted by the operator.

- I. Mounting flange and seal: The telescopic valve shall include a lower seal compression and mounting flange of the same alloy as the tube, machined to match the riser pipe bolt hole pattern and tube/gasket center holes. Each companion flange shall be furnished with a neoprene or EPDM rubber seal of the proper thickness and durometer for a tight seal around the slip tube, with accurately cut tube center hole and bolt holes to match the riser pipe and telescopic valve mounting flanges. The tube center hole on the seal flange shall be sized to assure that compression of the seal against the outer tube wall shall occur when the seal and pipe assembly is properly secured to the riser pipe flange.
- J. Anchorage: All assembly hardware and anchor bolts shall be of the same alloy as the slip tube and supplied by the telescoping valve manufacturer.

2.15 RESILIENT SEATED MUD VALVE

- A. The mud valve shall be of the heavy duty flanged type designed to provide a positive seal under both seating and unseating head conditions. The valves shall be non-rising or rising stem style as identified on the contract drawings. Frame, plug, and yoke shall be cast iron per ASTM 126B. Valve operating stem and lift nut shall be bronze (B412). The seat ring shall be bronze (B62) with a tapered, accurately machined seating face. The plug seat shall be seamless molded neoprene tapered to accurately mate with the seat ring for a positive seal.
- B. Where required, extension stems, floor stands, and stem guides shall be furnished by the valve manufacturer to make a complete and operable unit.
- C. Paint will be as identified in specification Section 09900.
- D. Valves and accessories shall be manufactured by Troy Valve, or approved equal.

2.16 TANK HYDROSTATIC PRESSURE RELIEF VALVE

- A. The valve shall be manufactured using a cast iron (ASTM126B) body and disc. The seat shall be bronze (B62) and the replaceable cover seat shall be BUNA-N. The diameter of the valve shall be 4" or 6".
- B. The valve shall be the Troy Valve Model A2580, Neenah Foundry model R5002 Type B, or an approved equal.

2.17 FIRE HYDRANTS

- A. Fire hydrants shall conform to AWWA C502 and shall be complete with all necessary fittings and accessories. They shall have one (1) four and one half inch (4½") pump connection and two (2) two and one half inch (2½") hose connections with NSFH threads of four (4) threads and seven and one half (7½) threads per inch, respectively. The hydrant shall open left (counterclockwise) and be of sufficient length for five foot (5') burial. Contractor shall verify direction of opening with Town prior to ordering. All hydrants shall be properly painted before shipment and after installation in accordance with AWWA C502. Federal yellow shall be the color used to paint all hydrants. They shall have an auxiliary valve as detailed on fire hydrant assembly standards.
- B. Hydrants shall be designed for 200 psi working pressure. The hydrant shall be designed such that the valve will remain closed if the upper portion of the fire hydrant is removed or broken off. The operating nut shall be pentagonal. Contractor shall verify direction of opening with City prior

to ordering. The hose caps shall be secured to the hydrant with a chain during shipment. The chains may only be removed after the hydrant is placed into service.

- C. The following fire hydrants, or approved equal, are acceptable for use in connection with water main installation, listed by manufacturer and model number:
 - 1. Clow, Medallion
 - 2. Mueller, A-423
 - 3. American Darling/American Flow Control B62B
- D. Auxiliary gate valve required as shown in Details.

2.18 WASHDOWN HYDRANT (@ FLOW EQUALIZATION)

- A. Hydrants shall be self-draining, non-freezing, compression type with 2-1/8" main valve opening. Inlet shall be 4" MJ. Outlet shall be 2-1/2" NST. Hydrants shall have a ductile iron pipe riser with a cast iron top stock, and brass or stainless steel non-turning operating rod. Principal interior operating parts shall be brass and removable from the hydrant for servicing without excavating the hydrant.
- B. Hydrants shall be set in 4 cubic feet of crushed stone to allow for proper drainage of the hydrant. Recommendations of the AWWA should be followed when installing the hydrants.
- C. Yard hydrants (flushing hydrants) shall be Eclipse #2 Post Hydrants as manufactured by Kupferle Foundry Company, or approved equal.
- D. Quick connect adapters with dust caps shall be furnished by the Contractor for each hydrant.
- E. Provide auxiliary 4" gate valve and valve box within five feet of hydrant.

2.19 YARD HYDRANTS (FLUSHING HYDRANTS)

- A. Yard hydrants (flushing hydrants) shall be self-draining, non-freezing 2 1/8-inch standard AWWA fire hydrants, with one 2 1/2-inch NPT nozzle. The yard hydrants shall comply with AWWA C502 and the specifications for fire hydrants. The yard hydrants shall be provided with the proper shoe and any associated fitting(s) to allow connection to the yard piping.
- B. Hydrants shall be set in 4 cubic feet of crushed stone to allow for proper drainage of the hydrant. Recommendations of the AWWA should be followed when installing the hydrants.
- C. Yard hydrants shall be located at least 3 feet from nearest structural wall unless otherwise indicated on the Drawings.
- D. The Yard hydrants shall be Mueller Co. Model No. A-411, or equal.
- E. Auxiliary valve / curb stop at hydrant not required.

2.20 COMBINATION AIR VALVE

- A. Valve shall be capable of venting sufficient quantities of air as determined by the manufacturer's approved sizing methods, while pipelines are being filled and allowing air to re-enter while pipelines are being drained.
- B. Valves shall be manufactured and tested in accordance with American Water Works Association (AWWA) Standard C512.
- C. Combination Air Valves shall be automatic float operated valves designed to exhaust large quantities of air during the filling of a piping system and close upon liquid entry. The valve shall open during draining or if a negative pressure occurs. The valve shall also release accumulated air from a piping system while the system is in operation and under pressure. The valve shall perform the function of both Air Release and Air/Vacuum Valves and be furnished as a single body or dual body type as indicated on the plans.
- D. Manufacturer shall have a quality management system that is certified to ISO 9001 by an accredited, certifying body.
- E. Valve shall be Val-Matic single body VMC series, GA Industries, Inc. Figure 945, or approved equal.
- F. Valves shall be coated with fusion bonded epoxy per AWWA C550.
- G. Valves shall be installed in a manhole structure as shown on plans.
- H. Valves vaults must be equipped with an exhaust pipe extending to a downward facing elbow with the opening at an elevation of eighteen (18) inches above ground, unless noted otherwise on plans. Where specifically noted on plans, piping shall be extended from the valve exhaust above grade as shown on the plans.

2.21 ELECTRIC OPERATORS/ACTUATORS FOR VALVES

- A. General: The electric valve actuators for plug valves are to be capable of operating the valve under the maximum load. The actuator will be designed for indoor or outdoor service and capable of mounting in any position. The actuators should include in one integral unit the motor, power gearing, travel limit switches, torque limit switches, handwheel, terminals for motor power and controls and drive nut. Worm gear reducer shall be supplied for quarter turn valve applications. The actuators are to be Limitorque MX Series with APD, Rotork IQ Series, AUMA SA Series, or equal. All electrical wiring, conduit and cable plus all control conduit, wiring and controls shall be provided to make this system fully functional as intended by the Engineer. The system shall be integrated with SCADA.
- B. Closing Speed: Quarter turn valves shall operate between 30 and 60 seconds.
- C. Enclosure: The entire actuator enclosure should be watertight according to the Standard - NEMA 6. All covers and entries should be sealed by means of O-rings. All conduit entries should be properly sealed to maintain the watertight housing. Terminal compartment shall be separately sealed and will be fastened to the gear housing by stainless steel bolts, which are "captured" to prevent loss when covers are removed.
- D. Housing: Any load bearing housings or enclosures will be cast iron. The non-load bearing enclosures and covers may be of cast iron, aluminum, or stainless steel. All housings are to be adequately designed, manufactured and inspected to assure against the ingress of moisture.

- E. Gearing: All power gearing will be made of hardened steel or bronze and operate in an oil lubricant. All limit switch gearing and feedback device reduction gearing will be steel or bronze and adequately lubricated. All rotating shafts will be supported by anti-friction bearings.
- F. Motor: The drive motor should be specifically designed for actuator service and should be characterized by high starting torque, low stall torque and low inertia. The motor should be capable of starting against the rated load in either the open or close direction when voltage to the motor terminals is plus or minus 10 percent of nameplate rating. Power supply for the motor shall be 460 volt, 3 phase, 60 Hz.
 - 1. The motor should be induction type with Class F - tropicalized insulation. A thermostat is to be imbedded in the windings to insure safe motor shut-down during periods of high current draw resulting in a high temperature condition.
 - 2. The motor housing should be totally enclosed non-ventilated.
 - 3. The motor should be capable of operating in any position. It should be properly sealed from the lubricant filled gear case to allow the motor to be mounted in any position relative to the gear case. Removal of the motor shall not result in loss of lubricant.
 - 4. Motor shall have plug and socket electrical connection to facilitate easy removal and replacement.
- G. Handwheel: A handwheel will be permanently attached for manual operation. A positive de-clutch mechanism will engage the handwheel when required. Engagement or disengagement of the manual drive will not cause damage to the operator even if the motor is running. The handwheel shall not be driven by motor operation. The handwheel drive will be independent of the motor drive such that the failure of any one gear will not cause the loss of both manual and motor drive.
- H. Stem Nut: Actuator is to have a separate drive nut/thrust bearing assembly mounted to the base of the actuator. This provides easy actuator mounting and removal without unloading the valve stem, thereby, allowing the valve to remain in service. Stem nut should be of high tensile bronze, or other material compatible with the valve stem. Grease fitting on drive assembly will be furnished to allow periodic lubrication of drive nut and thrust bearings. In quarter turn valve applications the drive nut will attach to the worm gear shaft and a thrust bearing assembly is not required.
- I. Limit Switches: Travel limit switches will be provided to de-energize the motor control circuit when the actuator reaches the limits of travel in the open and close directions.
 - 1. Limit switches and the limit switch drive will be integral part of the actuator.
 - 2. The limit switch drive will be "in step" with the actuator output drive at all times in either the electrical or manual modes of operation. A minimum of four (4) independently adjustable contacts will be supplied. The contacts will be of silver and adequately rated to carry the control current. All contacts are to be completely sealed in a NEMA 6 enclosure to prohibit electrical shock while adjusting, eliminate shorting out and ensure that contaminants do not foul the contacts. All contact settings shall be made non-intrusively.
 - 3. Limit switches will be fully adjustable and provide full functionality even if the external power source is no longer present.
 - 4. Furnish a dry contact closure that is closed in the full closed position for remote monitoring.

- J. Torque Switches: Torque limit switches will be provided to de-energize the motor control circuit when the valve encounters an obstruction during travel. Each actuator will have an independent torque adjustment for the open and close directions.
1. The torque switches will be adjustable in units or torque. Torque will be calibrated prior to the actuator's assembly to the valve.
 5. Torque switches will be adequately rated to carry the control current. The contacts are to be completely sealed in a non-intrusive enclosure.
- K. Heater: An adequately sized space heater will be installed in the limit switch compartment if needed to aid in the prevention of damage resulting from condensation.
- L. Position Indicator: The position indicator will be furnished to continuously indicate the position of the valve at and between the fully open and fully closed positions. The indicator will operate when the actuator is in either the electric mode or manual mode. Position will be displayed even if the main (or external) power supply is not available.
- M. Terminal Housing: The terminals are to be housed in a separately sealed compartment that is isolated from the electrical compartment. A minimum of two- 3/4" NPT conduit entries will be furnished.
- N. Controls (Modulating Service): Motor controls will be furnished as integral part of the actuator. In all cases, controls will be furnished in enclosures rated NEMA 4 & 6. In addition, a wiring schematic will be furnished with each actuator.
1. Motor controls will consist of solid state contactors to reverse motor direction, transformer for control power, to protect against incorrect or incomplete power and positioner. Contactors shall be capable of up to 1,200 starts per hour. The actuator should contain logic that prevents reverse phasing, single phasing, instant motor reversal and torque switch hammer.
 2. Positioner will accept a 4-20 mA analog control signal, compare it with existing valve position via feedback and energize the open or close circuit of the motor controls. Failure position on loss of command signal will be field selectable in either the "open", "close" or "in place" positions. Deadband will be field adjustable between 0.5% and 5.0% of full valve range. Accuracy shall be 0.5% to 1%. Time delay (adjustable between 0 and 99 seconds), zero and span will also be adjustable. Light or LED indications on the positioner will include "drive open", "drive close", "loss of command or feedback signal" and "time delay" (pause).
 6. The valve actuator shall have a valve position transmitter, 24 vdc-2 wire type that can send a 4-20 mA analog signal that will indicate the position of the actuator.
 7. Local control will be by an "open-stop-close" control switch. Selection of operation from local or remote source will be by a padlockable "local-off-remote" selector switch. The local control switch and selector switch should be non-intrusive. The local-off-remote switch shall provide a dry contact closure when in the remote position for remote monitoring.
 8. The actuator shall incorporate an integral diagnostic display. The device shall display the direction of travel, the status of local or remote inputs, indication inputs and any factors inhibiting electrical operation.
 9. The actuator shall incorporate an integral device that captures and stores valve, actuator and control status information. The data available from the device should include valve torque profile and the actuator's operational log.

- O. Each actuator shall be warranted for a minimum of 30 months of operation - up to a maximum of 36 months from time of shipment from its factory. This warranty shall also be held in effect regardless of precommissioning storage conditions in a typical indoor or outdoor environment as long as the actuators are not disassembled or physically abused. This warranty shall also be enforced even if special storage procedures (such as the use of plastic bags, desiccants, and the energizing of heaters) are not utilized.

2.22 T-HANDLE OPERATING WRENCHES

- A. T-handle operating wrenches shall be provided in the number and lengths necessary to permit operation of all valves by operators of average height working in normal positions.

2.23 WATER PRESSURE REDUCING VALVES

- A. A Water Pressure Reducing Valve with integral strainer shall be installed as indicated in the Contract Documents to reduce supply main pressures to the values indicated on the Drawings, or lower. The valve shall feature a bronze body suitable for water supply pressures up to 300psi (20.7 bar). Provision shall be made to permit the bypass flow of water back through the valve into the main when pressures, due to thermal expansion on the outlet side of the valve, exceed the pressure in the main supply. Water Pressure Reducing Valve with built-in bypass check valves will be acceptable. Approved valve shall be listed to ASSE 1003 and IAPMO and certified to CSA B356. Valve shall be a Watts Regulator Company Series 25AUB-Z3, or equal.

2.24 TAPPING SLEEVE AND VALVE:

- A. The tapping sleeve and valve shall be suitable for wet installation without interrupting water service.
- B. The tapping sleeve shall be suitable for the pipe material of the line being tapped.
- C. Tapping sleeves shall be manufactured of ductile iron or stainless steel. Stainless steel sleeves shall be Type 304 steel. Sleeve shall be flanged faced and drilled per ANSI B 16.1, with standard tapping flange counterbore per MSS SP-60. Tapping sleeves shall meet minimum working pressure requirements of 200 psi for twelve inch and smaller sleeves. All tapping sleeves shall include a test plug.
- D. Gasket for tapping sleeve shall completely surround pipe.
- E. Nuts and bolts shall be Type 304 stainless steel.
- F. Acceptable tapping sleeves:
 - 1. Romac SST III
 - 2. Mueller H-304
 - 3. Or approved equal
- G. The tapping valve shall be mechanical joint x tapping flange. The flanged end shall have a raised face to match counterbore in tapping sleeve outlet per MSS SP-60. Tapping valves shall also conform to the specifications as outlined for gate valves in this Specification.

2.25 TAPPING SADDLES

- A. Tapping saddles shall be used for all service taps of thermoplastic or HDPE mains. The tapping saddles and hardware shall be ductile iron with epoxy coating, stainless steel or bronze material with AWWA tapered threads. The tapping saddle design shall be hinged or bolted, both with a minimum strap width of two inches (2"). Three (3) piece tapping saddle design is not allowed.

2.26 VALVE BOXES AND CURB BOXES

- A. Valve boxes shall cast iron, three (3) piece, Buffalo, screw type boxes. The boxes shall be five and one-quarter inch (5¼") shaft size with a round base. The word "water" shall be cast on the box lid for water valves.
- B. Each buried valve shall be provided with a suitable valve box. Boxes shall be of the adjustable, telescoping, heavy-pattern type with the lower part of cast iron and the upper part of steel or cast iron. They shall be so designed and constructed as to prevent the direct transmission of traffic loads to the pipe or valve.
- C. The upper or sliding section of the box shall be provided with a flange having sufficient bearing area to prevent undue settlement. The lower section of the box shall be designed to enclose the operating nut and stuffing box of the valve and rest on the valve bonnet.
- D. The boxes shall be adjustable through at least 6 in. vertically without reduction of the lap between sections to less than 4 in.
- E. The valve box lengths shall be as necessary for the depths of the valves or stops with which the boxes are to be used.
- F. Covers for valves shall be close fitting and substantially dirt-tight.
- G. The top of the cover shall be flush with the top of the box rim, unless noted otherwise on drawings.
- H. Valve boxes shall be accurately centered over valve operating nut, and backfill thoroughly tamped about them. Valve box bases shall not rest on the valves but shall be supported on crushed stone fill, brick, or block and not the valve bonnet. They shall be set vertically and properly cut and/or adjusted so that the tops of boxes will be at grade in any paving, walk or road surface.
- I. Valve boxes cast into concrete surfacing shall have brass covers, which can be secured.

2.27 SURGE RELIEF VALVE

- A. The Surge Relief Valve shall relieve excessive line pressure when above maximum pre-set and shall meet the pressure requirements of the application.
- B. Main Valve: The main valve shall be a center guided, diaphragm actuated globe valve of oblique (Y) pattern design for better flow rate efficiency, flanged to meet ANSI B16.5. The body and cover shall be ductile iron. The body shall have a replaceable, raised, stainless steel seat ring. There may be no obstacles within the flow path. No stem guided / dual bearing actuators shall be allowed. Piston valves shall be unacceptable. All valve components shall be accessible and serviceable without removing the valve from the pipeline.

- C. Actuator: The actuator assembly shall be able to be easily transformed in the field to a double-chambered design for system upgrades, with an inherent separating partition between the lower surface of the diaphragm and the main valve. The diaphragm shall be EPDM. The entire actuator assembly (seal disk to top cover) shall be removable from the valve as an integral unit. The valve shaft and pressure spring shall be stainless steel and shall be center-guided by a single bearing in the separating partition. The replaceable radial seal disk shall include a resilient EPDM seal.
- D. Control System: The control system shall consist of a 2-way adjustable, direct acting, pressure sustaining/relief pilot, isolation cock valves, a needle valve for closing speed control, and a high capacity Type-F Large Control Filter, which increases the reliability of the control valve system and time between maintenance, while minimizing faulty operation. SS tubing, fittings, and controls to be provided.
- E. The Surge Relief Valve shall be a 10" model WW10-730-Y-C-A5-EB-NN-FN as manufactured by Bernad, Inc., Houston, TX, or approved equal. NSF 61 certification is not required.
- F. The valve manufacturer shall warrant the valve to be free of defects in material and workmanship for three years from date of shipment, provided the valve is installed and used in accordance with the manufacturer's written instructions and approved submittals.

2.28 MASTER METER

- A. Approved Manufacture:

Omni or approved Equal
- B. Installation of the system master meter or other large meters generally greater than two (2) inches shall be accomplished in a meter pit constructed in accordance with the Standard Details and the appropriate specifications for concrete and masonry work contained herein. The installation shall be equipped with gate valves, testing ports, check valve and locking cover as shown in the Standard Details. The meter pit installation shall be waterproof.
- C. Meters larger than two (2) inches shall be compound meters designed with a turbine section for large flows and a rotating disc section for small flows, unless otherwise specified. The meter may be equipped with either single or double registers.
- D. The main case shall be high grade waterworks bronze, with hinged lid covers. The meter must have a maximum operating pressure of 200 PSI. The registers must be hermetically sealed direct reading. The measuring chambers shall be of bronze alloy composition. Measuring disc and turbine valves shall be of polypropylene or other corrosion-resistant material. The meter shall measure water within 2 percent of a separately measured volume.

PART 3 - EXECUTION

3.1 GENERAL

- A. Make connections between valves and piping as specified elsewhere.
- B. Install valves, hydrants, and other appurtenances as shown, specified, and as recommended by the manufacturer.
- C. In the event of conflict between manufacturer's recommendations and the Contract Documents, request interpretation from Engineer before proceeding.
- D. Do not install service connections until new mains have been successfully tested and placed in service.
- E. Prior to ordering tapping sleeve assembly, expose existing main and verify circumference of existing pipe.

3.2 FIRE HYDRANTS

- A. Install hydrants as shown and indicated in the Contract Documents.
- B. Provide suitable adapters when hydrants and piping have different joint types.
- C. Provide thrust restraint at all hydrants located at pipeline terminations.
- D. Set hydrants plumb and to grade of curb, street, alley, highway, or right-of-way with pumper nozzle toward middle line of street, highway, or right-of-way.
- E. Set hydrant and on solid earth, crushed stone or well tamped gravel; provide loose stone or gravel fill up to drainage port.
- F. Where fire hydrant must be located in a paved area provide a minimum of 5-foot by 5-foot concrete block-out, with expansion joints on all sides.
- G. If necessary, as determined by ENGINEER, to set a fire hydrant at a greater depth of bury as a result of changing hydrant location from that shown, adjust elevation by furnishing and installing the fire hydrant manufacturer's standard barrel and stem extensions.

3.3 BURIED VALVES

- A. Install valves, valve boxes, and curb boxes as shown and indicated in the Contract Documents.
- B. Provide suitable adapters when valves and piping have different joint types.
- C. Provide thrust restraint at all valves.
- D. Set valves plumb and on solid bearing.
- E. The height of the valve and its supporting foundation shall conform to the height of the connecting pipe. Valves shall be set in a vertical position unless otherwise indicated on the Drawings.

3.4 EXPOSED VALVES

- A. Exposed valves shall be installed in a vertical position where possible. Unless otherwise indicated or directed by the Engineer, valve stems shall never be in a horizontal position.

3.5 VALVE OPERATION

- A. Open and close each valve observing full operation prior to installing successive lengths of pipe.

3.6 VALVE BOXES

- A. Boxes shall rest on the valve and shall be adjusted so that the cover may be set flush with paving; in areas without paving set the cover as directed by the Owner. Boxes shall be set to allow equal movement above and below finish grade.
- B. The base of the box shall be centered over the valve, and the top of the base section shall be approximately on line with the nut on top of the valve stem. The entire assembly shall be plumb.

3.7 TAPPING SLEEVE AND VALVE

- A. Contractor shall perform the tapping of the existing main according to the manufacturer's specifications.
- B. The Contractor shall excavate an area of sufficient size and depth, conforming to OSHA requirements, to accommodate the operations of tapping the existing line and setting the valve.
- C. Assemble, align, and fit tapping sleeve and tapping valve to main using personnel skilled and experienced in making of pressure taps. In the event of mismatch of purchased materials, refit in the field or make necessary arrangements with manufacturer for factory refit. Remove section of severed water main through tapping valve and present to OWNER as proof of satisfactory execution of the operation. OWNER may retain coupon for further analysis or testing to evaluate the condition of existing water main.
- D. The Contractor shall furnish and install a valve box with the necessary extensions, backfill and compact the excavated area.
- E. The Contractor shall perform a 150 psi hydrostatic pressure test, or a different pressure as required by the Engineer, on the tapping sleeve and valve prior to tapping the existing water main. Lower test pressures for air testing will be permitted only when approved in writing by the Engineer. This pressure test will be performed using the test plug provided with the tapping sleeve.

3.8 CONNECTIONS AND INSERTIONS INTO EXISTING MAINS

- A. Existing mains into which valves are to be inserted cannot be shut down or taken out of service unless noted on the Plans. The entire operation of installing the valves shall be accomplished below 100 psig at the point of installation.
- B. Connect new mains to existing mains using proper fittings and in a manner acceptable to Owner and Engineer.

- C. Expose existing mains at connection points 10 days prior to making connections to determine elevation, verify type of pipe, confirm outside diameter of pipe, and identify type of restraints existing.
- D. No cut-ins or connections to existing mains shall be made unless at least 48 hours notice is given to Owner and Engineer.
- E. Plan all connecting work to reduce number of shutoffs.
- F. Two days prior to shutting valves on existing lines, notify local official in charge of the water works system, and Engineer of such shutoff.
- G. Keep shutoff time, if permitted by Engineer, to a minimum and do at off-peak hours.
- H. A representative of Owner shall operate existing valves. Contractor shall not operate existing valves.
- I. Owner and Engineer assume no responsibility for any delay occasioned by special requirements or conditions which must be met in making connections.
- J. Take extreme care in making connections to prevent contamination of existing mains.
- K. Before making cut-ins or connections to existing water mains, wash all fittings, valves, and pipe with clean water, and then disinfect by washing with a chlorine solution having a residual chlorine strength of not less than 50 ppm.
- L. Plugs removed from existing mains that are not damaged may be reused within the Project, and those remaining after completion of construction shall remain the property of Owner.

3.9 BACKFLOW PREVENTION DEVICES

- A. Install backflow valves where required and in accordance with manufacturer's recommendations.

END OF SECTION



Kentucky Transportation
Cabinet Project:

N O T I C E

**DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
NATIONWIDE SECTION 404 PERMIT AUTHORIZATION**

**DEPARTMENT FOR ENVIRONMENTAL PROTECTION
KENTUCKY DIVISION OF WATER
SECTION 401 WATER QUALITY CERTIFICATION**

**PROJECT DESCRIPTION: Bridge Replacement
Kenmont Road over N. Fork Kentucky River
Perry County, KY
KYTC Item No. 10-1113**

The Sections 404 and 401 activities for this project have previously been permitted under the authority of the Department of the Army, Section 404 Nationwide Permit Number 3, *Maintenance Projects* (with additional *Kentucky Regional General Conditions*), and the Kentucky Division of Water, Section 401 General Water Quality Certification. For these authorized permits to be valid, the attached conditions must be followed. The contractor shall post a copy of this Nationwide Permit Number 3 and General Water Quality Certification in a conspicuous location at the project site, with unencumbered public access, for the duration of construction and comply with the general conditions required.

Kentucky Transportation
Cabinet Project:

Locations Impacting Water Quality

Station-Location	Description
Bridge ID: 097C00005N	Kenmont Road over N. Fork Kentucky River project will entail replacing the existing bridge and constructing a new bridge in the same location and with the same current geometrics (bridge width, length, hydraulic opening, etc.). The project may involve the removal of debris and/or sediment.

This project involves work near and/or within Jurisdictional Waters of the United States as defined by the U. S. Army Corps of Engineers; therefore, requiring a Nationwide Number 3 General Section 404 permit. The Division of Water conditionally certified this General Permit. Importantly, one of those conditions regards the use of heavy equipment in any stream channel, or streambed. If there is need to cross the stream channel with heavy equipment, or conduct work within the stream channel, a work platform or temporary crossing, is authorized. This should be constructed with clean rock and sufficient pipe to allow stream flow to continue, unimpeded. Other conditions may be found under the heading, *General Certification—Nationwide Permit # 3 Maintenance Projects*.

In order for this authorization to be valid, the attached conditions must be followed. The contractor shall post a copy of this Nationwide Permit Number 3 Approval in a conspicuous location at the project site, for the duration of the 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 Kentucky Transportation Cabinet, Division of Environmental Analysis. If such changes necessitate further permitting, then the contractor will be responsible for applying to the U. S. Army Corps of Engineers and the Kentucky Division of Water. A copy of any request to the Corps of Engineers or Division of Water 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.

Terms for Nationwide Permit No. 3 – Maintenance Projects

(a) The repair, rehabilitation, or replacement of any previously authorized, currently serviceable structure or fill, or of any currently serviceable structure or fill authorized by 33 CFR 330.3, provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification. Minor deviations in the structure's configuration or filled area, including those due to changes in materials, construction techniques, requirements of other regulatory agencies, or current construction codes or safety standards that are necessary to make the repair, rehabilitation, or replacement are authorized. This NWP also authorizes the removal of previously authorized structures or fills. Any stream channel modification is limited to the minimum necessary for the repair, rehabilitation, or replacement of the structure or fill; such modifications, including the removal of material from the stream channel, must be immediately adjacent to the project. This NWP also authorizes the removal of accumulated sediment and debris within, and in the immediate vicinity of, the structure or fill. This NWP also authorizes the repair, rehabilitation, or replacement of those structures or fills destroyed or damaged by storms, floods, fire or other discrete events, provided the repair, rehabilitation, or replacement is commenced, or is under contract to commence, within two years of the date of their destruction or damage. In cases of catastrophic events, such as hurricanes or tornadoes, this two-year limit may be waived by the district engineer, provided the permittee can demonstrate funding, contract, or other similar delays.

(b) This NWP also authorizes the removal of accumulated sediments and debris outside the immediate vicinity of existing structures (e.g., bridges, culverted road crossings, water intake structures, etc.). The removal of sediment is limited to the minimum necessary to restore the waterway in the vicinity of the structure to the approximate dimensions that existed when the structure was built, but cannot extend farther than 200 feet in any direction from the structure. This 200 foot limit does not apply to maintenance dredging to remove accumulated sediments blocking or restricting outfall and intake structures or to maintenance dredging to remove accumulated sediments from canals associated with outfall and intake structures. All dredged or excavated materials must be deposited and retained in an area that has no waters of the United States unless otherwise specifically approved by the district engineer under separate authorization.

(c) This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to conduct the maintenance activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. After conducting the maintenance activity, temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

(d) This NWP does not authorize maintenance dredging for the primary purpose of navigation. This NWP does not authorize beach restoration. This NWP does not authorize new stream channelization or stream relocation projects.

Notification: For activities authorized by paragraph (b) of this NWP, the permittee must submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 32). The pre-construction notification must include information regarding the original design capacities and configurations of the outfalls, intakes, small impoundments, and canals. (Authorities: Section 10 of the Rivers and Harbors Act of 1899 and section 404 of the Clean Water Act (Sections 10 and 404))

Note: This NWP authorizes the repair, rehabilitation, or replacement of any previously authorized structure or fill that does not qualify for the Clean Water Act section 404(f) exemption for maintenance.



MATTHEW G. BEVIN
GOVERNOR

CHARLES G. SNAVELY
SECRETARY

**ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION**

R. BRUCE SCOTT
COMMISSIONER

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601

**General Certification--Nationwide Permit # 3
Maintenance**

This General Certification is issued March 19, 2017, in conformity with the requirements of Section 401 of the Clean Water Act of 1977, as amended (33 U.S.C. §1341), as well as Kentucky Statute KRS 224.16-050.

For this and all nationwide permits, the definition of surface water is as per 401 KAR 10:001 Chapter 10, Section 1(80): Surface Waters means those waters having well-defined banks and beds, either constantly or intermittently flowing; lakes and impounded waters; marshes and wetlands; and any subterranean waters flowing in well-defined channels and having a demonstrable hydrologic connection with the surface. Lagoons used for waste treatment and effluent ditches that are situated on property owned, leased, or under valid easement by a permitted discharger are not considered to be surface waters of the commonwealth.

The Commonwealth of Kentucky hereby certifies under Section 401 of the Clean Water Act (CWA) that it has reasonable assurances that applicable water quality standards under Kentucky Administrative Regulations Title 401, Chapter 10, established pursuant to Sections 301, 302, 304, 306 and 307 of the CWA, will not be violated for the activity covered under NATIONWIDE PERMIT 3, namely Maintenance, provided that the following conditions are met:

1. The activity will not occur within surface waters of the Commonwealth identified by the Kentucky Division of Water as Outstanding State or National Resource Water, Cold Water Aquatic Habitat, or Exceptional Waters.
2. The activity will not occur within surface waters of the Commonwealth identified as perpetually-protected (e.g. deed restriction, conservation easement) mitigation sites.
3. The activity will impact less than 1/2 acre of wetland/marsh.
4. The activity will impact less than 300 linear feet of surface waters of the Commonwealth.

General Certification--Nationwide Permit # 3
Maintenance
Page 2

5. The Kentucky Division of Water may require submission of a formal application for an individual certification for any project if the project has been determined to likely have a significant adverse effect upon water quality or degrade the waters of the Commonwealth so that existing uses of the water body or downstream waters are precluded.
6. Activities that do not meet the conditions of this General Water Quality Certification require an Individual Section 401 Water Quality Certification.
7. Activities qualifying for coverage under this General Water Quality Certification are subject to the following conditions:
 - Projects requiring in-stream stormwater detention/retention basins shall require individual water quality certifications.
 - Erosion and sedimentation pollution control plans and Best Management Practices must be designed, installed, and maintained in effective operating condition at all times during construction activities so that violations of state water quality standards do not occur.
 - Sediment and erosion control measures, such as check-dams constructed of any material, silt fencing, hay bales, etc., shall not be placed within surface waters of the Commonwealth, either temporarily or permanently, without prior approval by the Kentucky Division of Water's Water Quality Certification Section. If placement of sediment and erosion control measures in surface waters is unavoidable, design and placement of temporary erosion control measures shall not be conducted in such a manner that may result in instability of streams that are adjacent to, upstream, or downstream of the structures. All sediment and erosion control devices shall be removed and the natural grade restored within the completion timeline of the activities.
 - Measures shall be taken to prevent or control spills of fuels, lubricants, or other toxic materials used in construction from entering the watercourse.
 - Removal of riparian vegetation shall be limited to that necessary for equipment access.
 - To the maximum extent practicable, all in-stream work under this certification shall be performed under low-flow conditions.
 - Heavy equipment, e.g. bulldozers, backhoes, draglines, etc., if required for this project, should not be used or operated within the stream channel. In those instances in which such in-stream work is unavoidable, then it shall be performed in such a manner and duration as to minimize turbidity and disturbance to substrates and bank or riparian vegetation.
 - Any fill shall be of such composition that it will not adversely affect the biological, chemical, or physical properties of the receiving waters and/or cause violations of water quality standards. If rip-rap is utilized, it should be of such weight and size that bank stress or slump conditions will not be created because of its placement.

General Certification--Nationwide Permit # 3
Maintenance
Page 3

- If there are water supply intakes located downstream that may be affected by increased turbidity and suspended solids, the permittee shall notify the operator when such work will be done.
- Should evidence of stream pollution or jurisdictional wetland impairment and/or violations of water quality standards occur as a result of this activity (either from a spill or other forms of water pollution), the Kentucky Division of Water shall be notified immediately by calling (800) 928-2380.

Non-compliance with the conditions of this general certification or violation of Kentucky state water quality standards may result in civil penalties.



**US Army Corps
of Engineers®**

Louisville District

2017 Nationwide Permit General Conditions

The following General Conditions must be followed in order for any authorization by NWP to be valid:

1. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the US Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species.

3. Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. Migratory Bird Breeding Areas. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. Wild and Scenic Rivers. (a) No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

(b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. The permittee shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.

(c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: <http://www.rivers.gov/>

17. Tribal Rights. No activity may impair tribal rights (including treaty rights), protected tribal resources, or tribal lands.

18. Endangered Species. (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless section 7 consultation addressing the effects of the proposed activity has been completed. Direct effects are the immediate effects on the listed species and critical habitat caused by the NWP activity. Indirect effects are those effects on listed species and critical habitat that are caused by the NWP activity and are later in time, but still are reasonably certain to occur.

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

(c) Non-federal permittees must submit a pre-construction notification (PCN) to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the PCN must include the name(s) of the endangered or threatened species that might be affected by the proposed activity or that utilize the designated critical habitat that might be affected by the proposed work. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete PCN. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from Corps.

(d) As a result of formal or informal consultation with the USFWS or NMFS the district engineer may add species-specific permit conditions to the NWP.

(e) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the USFWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will review the ESA section 10(a)(1)(B) permit, and if he or she determines that it covers the proposed NWP activity, including any incidental take of listed species that might occur as a result of conducting the proposed NWP activity, the district engineer does not need to conduct a separate section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete PCN whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

(g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the USFWS and NMFS or their world wide web pages at <http://www.fws.gov/> or <http://www.fws.gov/pac> and <http://www.nmfs.noaa.gov/pz/species/esa> respectively.

19. **Migratory Birds and Bald and Golden Eagles.** The permittee is responsible for ensuring their action complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting appropriate local office of the U.S. Fish and Wildlife Service to determine applicable measures to reduce impacts to migratory birds or eagles, including whether "incidental take" permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. **Historic Properties.** (a) In cases where the district engineer determines that the activity may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those

requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of Section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause an effect on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: no historic properties affected, no adverse effect, and adverse effect. Where the non-Federal applicant has identified historic properties on which the activity might have the potential to cause effects and notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed.

(d) For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify the non-federal applicant that he or she cannot begin the activity until Section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the activity on historic properties.

21. **Discovery of Previously Unknown Remains and Artifacts.** If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal and state coordination required to determine if the items or remains warrant recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the US are not authorized by NWP's 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWP's 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWP's only after it is determined that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal, and provides a project-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse environmental effects.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation to ensure that the activity results in no more than minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult-to-replace resources (see 33 CFR 332.3(e)(3)).

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g. conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. Restored riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on the both sides of a stream or if the waterbody is a lake or coastal waters. Then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g. riparian areas and/or wetlands compensation) based on what is best for the aquatic environmental on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWP's, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation if the use of mitigation bank or in-lieu fee program credits is not appropriate and practicable.

(2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f).)

(3) Since the likelihood of success is greater, and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.

(6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan.

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWP's. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the minimal impact requirement for the NWP's.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or separate permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible compensatory mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality

Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or USEPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature: "When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

(Transferee)

(Date)

30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

- (a) A statement that the authorized work was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;
- (b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(i)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and
- (c) The signature of the permittee certifying the completion of the work and mitigation. The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

31. Activities Affecting Structures or Works Built by the United States. If an NWP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally

authorized Civil Works project (a "USACE project"), the prospective permittee must submit a pre-construction notification. See paragraph (b)(10) of general condition 32. An activity that requires Section 408 permission is not authorized by the NWP until the appropriate Corps office issues the section 408 permission to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.

32. Pre-Construction Notification (PCN). (a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

- (1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or
- (2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f) and/or Section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

- (1) Name, address and telephone numbers of the prospective permittee;
- (2) Location of the proposed activity;
- (3) Identify the specific NWP or NWPs the prospective permittee wants to use to authorize the proposed activity;

(4) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by any proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant pre-crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures. For single and complete linear projects, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other water for each single and complete crossing of those wetlands, other special aquatic sites, and other waters. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an

illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(7) For non-federal permittees, if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed activity or utilize the designated critical habitat that may be affected by the proposed activity. For any NWP activity that requires pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act;

(8) For non-federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. Federal permittees must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

(9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the "study river" (see general condition 16); and

(10) For an activity that requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from the Corps office having jurisdiction over that USACE project.

(c) Form of PCN Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is an NWP PCN and must include all of the information required in paragraphs (b)(1) through (10) of this general condition. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submittals.

(d) Agency Coordination: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for: (i) all NWP activities that require preconstruction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300 linear feet of stream bed; (iii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iv) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line or ordinary high water mark.

(3) When agency coordination is required, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural

resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or e-mail that they intend to provide substantive, site specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of PCN notifications to expedite agency coordination.

Further Information

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.

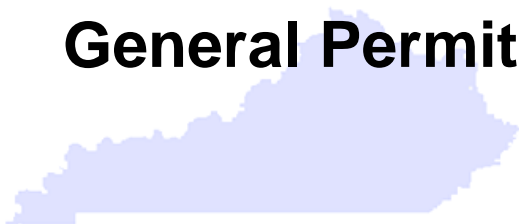
2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.

3. NWPs do not grant any property rights or exclusive privileges.

4. NWPs do not authorize any injury to the property or rights of others.

5. NWPs do not authorize interference with any existing or proposed Federal project (see general condition 31).

General Permit



DEVELOPMENT ALONG OR ADJACENT TO A STREAM

Development in a Floodplain General Permit

Permit Number: KY FPGP

AI No.: 35050

Pursuant to Authority established in KRS Chapter 151,

Development activities that occur in a floodplain for the base flood event and that meet the eligibility requirements of this permit,

are authorized along or adjacent to a stream in areas located within the 120 counties of the Commonwealth of Kentucky,

in accordance with the requirements of 401 KAR 4:060, and other conditions set forth in this permit.

This permit shall become effective on 7/1/2020.

This permit and the authorization shall expire 6/30/2025.

6/27/20

Date Signed

Paul Miller, PE

Paul Miller, Director

Division of Water

1. PERMIT COVERAGE

2. EXCLUSIONS AND ELIGIBILITY

3. PERMIT REQUIREMENTS

4. OTHER CONDITIONS

3

5

8

10

SECTION 1

PERMIT COVERAGE

1. PERMIT COVERAGE

Coverage under this General Permit issued by the Kentucky Division of Water (the "Division"), allows for development activities along or adjacent to a stream, that meet the eligibility requirements established in this permit, and that do not increase the Base Flood Elevation in any community.

Development meeting the requirements of this General Permit shall have automatic coverage under this general permit without making application or submitting plans and specifications to the Division.

Proposed development with the potential to change the Base Flood Elevation shall require an application for an Individual Floodplain Development Permit to Construct Along or Across a Stream pursuant to 401 KAR 4:060.

The property owner or entity employed to develop the property (the "Permittee"), and who is authorized for coverage under this General Permit by the Division, is exempt from public notice requirements as long as the development is conducted in accordance with the requirements of this General Permit.

This General Permit is issued pursuant to KRS 151.250 and 401 KAR 4:060 regarding stream obstruction only and does not constitute certification of any other aspect of proposed development. Ongoing development shall comply with the terms and conditions of this General Permit within 90 days of its effective date, and new development shall comply with the terms and conditions of this General Permit upon beginning eligible development activities.

Work performed by or for the Permittee that does not fully conform to the limitations set forth in this General Permit is subject to partial or total removal and enforcement actions pursuant to KRS 151.280 as directed by the Kentucky Department for Environmental Protection and KRS 151.125 under the authority and powers of the Secretary.

The Permittee shall contact the Division of Water, Water Resources Branch, at (502) 564-3410 or at 401WQC@ky.gov to determine if a Water Quality Certification is required. If required, the Permittee shall obtain a Water Quality Certification from the Division before beginning development.

The Permittee shall contact the Division of Water, Surface Water Permit Branch at (502) 564-3410 or at SWPBsupport@ky.gov to determine if a Stormwater Construction Permit is required. If required, the Permittee shall obtain a Stormwater Construction Permit from the Division before beginning development.

The Permittee is liable for any damage resulting from the development, operation, or maintenance of the activities covered by this permit.

SECTION 2

EXCLUSIONS AND ELIGIBILITY

2. EXCLUSIONS AND ELIGIBILITY

2.1. Exclusions

- 1) Development not meeting the eligibility requirements listed in Section 2.2 of this General Permit shall require an application to be submitted to the Division for an Individual Floodplain Development Permit to Construct Along or Across a Stream, pursuant to 401 KAR 4:060.
- 2) Development with the potential to affect the Base Flood Elevation in a community shall require an application to be submitted to the Division for an Individual Floodplain Development Permit to Construct Along or Across a Stream, pursuant to 401 KAR 4:060.
- 3) Development in a stream or wetland that requires an Individual Water Quality Certification pursuant to 401 KAR 9:010 from the Division is not eligible for coverage under this General Permit.
- 4) Activities occurring adjacent to or in the floodplain associated with Special Use Waters, Exceptional Waters, or Outstanding State Resource Waters are not eligible for coverage under this General Permit. A map of waters of the Commonwealth may be obtained at the following internet address: watermaps.ky.gov/WaterHealthPortal.
- 5) Development of residential, non-residential, or appurtenant structures located in the base floodplain shall not be eligible for, nor granted, coverage under this General Permit.
- 6) Development of dams or other water impounding structures, or construction that does or may endanger life or cause property damage shall not be eligible for, nor granted, coverage under this General Permit.

2.2. Eligibility

The following activities are eligible for coverage under this General Permit:

- 1) Development constructed by the US Army Corps of Engineers;
- 2) Uses of open space as established in 44 CFR 80.19;
- 3) Vegetative and riparian buffers;
- 4) Stream obstruction removal, such as the removal of woody debris from a bridge or culvert after a storm event, that is completed as described in the Watershed Friendly Stream Maintenance guidance, and that does not result in materials being deposited in the floodplain for the base flood event. A copy of this guidance may be obtained at the following internet address: <https://eec.ky.gov/Environmental-Protection/Water/FloodDrought/Documents/StreamMaintenanceGuideFAQ.pdf>
- 5) Normal property maintenance activities that are done by hand such as cuttings, plantings, and temporarily placing woody debris in piles. Maintenance activities shall be completed and all materials removed from the base floodplain within 15 days;
- 6) Development of a below-grade swimming pool outside of the regulatory floodway;
- 7) Development and placement of utility poles, open-frame towers, or monopole towers with below grade foundations;
- 8) Development of below-grade utilities and subgrade drainage features (e.g. water lines, pipelines, subdrains, dropboxes, etc.);
- 9) Development and placement of an open-style guardrail along an existing roadway;
- 10) Geotechnical investigations, archeological investigations or installation of monitoring wells;

- 11) Repairs or maintenance to an existing shallow and narrow, man-made drainage-way, such as a swale or a ditch between two buildings. The man-made drainage-way cannot be mapped as having its own base floodplain. (A portion of the man-made drainage-way may empty into a larger waterbody that has a mapped base floodplain. For example, a ditch between two buildings that flows into an adjacent stream);
- 12) Development and placement of a fence that does not impede flow during a base flood event, as long as the fence is not constructed across a stream or wetland;
- 13) Locating a recreational vehicle that is fully licensed and ready for highway use in the floodplain for the base flood event for less than 180 consecutive days;
- 14) Removal of gravel or vein minerals from a stream by the Permittee for personal, noncommercial use that is completed as outlined in the Watershed Friendly Stream Maintenance guidance. Excavated materials shall not be placed along the banks of the stream or within the base floodplain. Eligibility for coverage under this General Permit shall be limited to fifty (50) tons or less excavated in twelve (12) successive calendar months in accordance with KRS 350.245. Eligibility for coverage under this General Permit shall not include removal of gravel or vein minerals that will be sold or transported on public roadways; or
- 15) Development in a watershed less than one square mile (1 mi²).

SECTION 3

REQUIREMENTS

3. PERMIT REQUIREMENTS

- 1) The Permittee shall maintain access to a copy of this General Permit at the development site.
- 2) Prior to beginning development, the Permittee shall obtain a local floodplain development permit if the county/city/community is an eligible or participating community in the National Flood Insurance Program. Upon completion of the development, the Permittee shall obtain final written approval from the local permitting agency confirming compliance with the requirements of the local floodplain ordinance.
- 3) All excess debris and material from development activities shall be removed from the base floodplain. Upon completion of development, the site shall not exceed original grade elevation.
- 4) The Permittee shall at all times minimize the size of the disturbance and the period of time that the disturbed area is exposed without stabilization practices. The following practices shall be adhered to:
 - a. Erosion prevention measures, sediment and silt control measures, and other site management practices shall be designed, installed, and maintained in an effective operating condition to prevent off site migration of sediment.
 - b. Erosion prevention measures include, but are not limited to, erosion control mats/blankets, and mulch/straw, and shall be implemented on disturbed areas within 24 hours or as soon as practical after completion of disturbance or following cessation of activities.
 - c. Standard silt control practices shall be used in such quantity to prevent siltation of waters of the Commonwealth. Practices that are acceptable include silt fences, rock check dams, and straw-bales.
 - d. Permanent vegetation shall be placed on the disturbance area within 14 days or as soon as possible upon completion of development.
- 5) The entry of mobile equipment into a stream channel shall be prohibited.
- 6) Measures shall be taken to prevent possible spills of fuels and lubricants from entering waters of the Commonwealth. Any spill or discharge to waters of the Commonwealth shall be reported to the Department for Environmental Protection immediately by calling the Cabinet's Environmental Emergency Response Line at 1-(800)-928-2380.
- 7) Violations of the requirements of this General Permit are subject to enforcement action under KRS 151.182 and penalties under KRS 151.990.

SECTION 4

OTHER CONDITIONS

4. OTHER CONDITIONS

4.1. Schedule of Compliance

The Permittee shall be in compliance with the requirements of this General Permit within 90 days of its effective date through the completion of development. This General Permit does not require a submission of an application to the Division, and therefore General Permit requirements for new development shall be met from the time an eligible activity begins through the completion of development. Should the Division determine the Permittee failed to comply with the requirements of this General Permit, the coverage may be terminated and the Permittee may be required to obtain an Individual Floodplain Development Permit to Construct Along or Across a Stream.

4.2. Other Permits

This General Permit has been issued under the provisions of KRS Chapter 151 and administrative regulations promulgated pursuant thereto. Issuance of this General Permit does not relieve the Permittee from the responsibility of obtaining any other permits or licenses required by this Division and other state, federal, and local agencies.

4.3. Continuation of Expiring Permit

In the event this General Permit expires prior to reissuance by the Division, the conditions and requirements of this General Permit shall continue in effect until the Division reissues or revokes the permit. However, new or expanded development is not eligible for coverage under this General Permit while it is expired until the General Permit is reissued.

4.4. Application for Permit

The Permittee is not required to submit an application for coverage under this General Permit. All eligible development activities shall be granted automatic coverage.

4.5. Duty to Comply

The Permittee shall comply with the conditions of this General Permit. Violations of the requirements of this General Permit are subject to enforcement action as established in KRS 151.182, and penalties under KRS 151.990, or revocation of coverage under this General Permit.

4.6. Need to Halt or Reduce Activity Not a Defense

Any work performed by the Permittee that does not fully conform to the limitations established in this General Permit is subject to partial or total removal, and to enforcement actions as established in KRS 151.280 as directed by the Division. It shall not be a defense in an enforcement action for a Permittee to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

4.7. Duty to Mitigate

The Permittee shall take all reasonable steps to minimize or prevent any discharge or disposal in violation of this General Permit which has a reasonable likelihood of adversely affecting human health or the environment.

4.8. Change of Scope of Work

Notifying the Division of planned changes or anticipated noncompliance does not stay any condition of this General Permit.

4.9. Property Rights

The issuance of this General Permit by the Division does not convey any property rights of any kind or any exclusive privilege.

4.10. Duty to Provide Information

The Permittee shall furnish to the Director of the Division of Water (the "Director"), within the requested time frame, any information which the Director may request to determine compliance with this General Permit.

4.11. Inspection and Entry

The Permittee shall allow the Director or an authorized representative (including an authorized contractor acting as a representative of the Director), upon presentation of credentials and other documents as may be required by law, to:

- 1) Enter upon the development area where an activity covered under this General Permit is located or conducted, or where records are kept under the conditions of this General Permit;
- 2) Have access to and copy, at reasonable times, any records that are kept under the conditions of this General Permit;
- 3) Inspect at reasonable times any facilities, equipment practices, or operations regulated or required under this General Permit; and
- 4) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by KRS Chapter 151, any substances or parameters at any location.

Report of Geotechnical Exploration

097C00005N
Bridge over North Fork Kentucky
River
Perry County, Kentucky



Prepared by:
Stantec Consulting Services Inc.
Lexington, Kentucky

October 21, 2019



Stantec Consulting Services Inc.
3052 Beaumont Centre Circle, Lexington KY 40513-1703

October 21, 2019
File: rpt_001_let_178568003

Attention: Mr. Stuart McIntosh, PE
Bridging Kentucky Area 5 Team Lead
J.M. Crawford and Associates, Inc.
131 Prosperous Place #18A
Lexington, Kentucky 40509

**Reference: Report of Geotechnical Exploration
097C00005N
Bridge over North Fork Kentucky River
Perry County, Kentucky**

Dear Mr. McIntosh,

Stantec Consulting Services Inc. (Stantec) is submitting the geotechnical engineering report for the referenced structure with this letter. This report presents results of the field exploration along with our recommendations for the design and construction for the referenced bridge. As always, we enjoy working with your staff and if we can be of further assistance, please contact our office.

Sincerely,

STANTEC CONSULTING SERVICES INC.



Donald L. Blanton, PE
Senior Associate
Phone: (859) 422-3033
Fax: (859) 422-3100
Donald.Blanton@stantec.com

/rws

REPORT OF GEOTECHNICAL EXPLORATION

Table of Contents

1.0 INTRODUCTION 1

2.0 SITE TOPOGRAPHY AND GEOLOGIC CONDITIONS 2

3.0 FIELD INVESTIGATION..... 2

4.0 SUBSURFACE CONDITIONS 3

5.0 LABORATORY TESTING AND RESULTS..... 3

6.0 ENGINEERING ANALYSES..... 3

6.1 GENERAL 3

6.2 BEARING CAPACITY FOR SPREAD FOOTINGS ON BEDROCK..... 4

6.3 STEEL H-PILE ANALYSES 4

6.3.1 Pile Capacity.....4

6.3.2 Hammer Energy4

7.0 FOUNDATION SYSTEM RECOMMENDATIONS..... 5

7.1 GENERAL 5

7.2 SPREAD FOOTINGS FOUNDATIONS..... 6

7.3 STEEL H-PILE FOUNDATIONS..... 7

8.0 CLOSING 8

LIST OF TABLES

Table 1. Bridge over North Fork Kentucky River– Summary of Borings..... 2

LIST OF FIGURES

Figure 1. Google Image Showing Project Site..... 1

LIST OF APPENDICES

APPENDIX A SITE MAP

APPENDIX B TYPED BORING LOGS

APPENDIX C LABORATORY DATA SHEETS

REPORT OF GEOTECHNICAL EXPLORATION

October 21, 2019

1.0 INTRODUCTION

The Kentucky Transportation Cabinet (KYTC) has initiated the Bridging Kentucky program. The purpose of the program is to rehabilitate or replace over 1,000 bridges across the state. Bridges that have been identified to be a part of the program are structures that because of their deteriorating conditions and resulting low load ratings are limiting the movement of people and freight across the state.

This report addresses the geotechnical considerations for Bridge 097C00005N, Kenmont Road over North Fork Kentucky River which is in Perry County, Kentucky. The bridge location is presented on Figure 1 below.

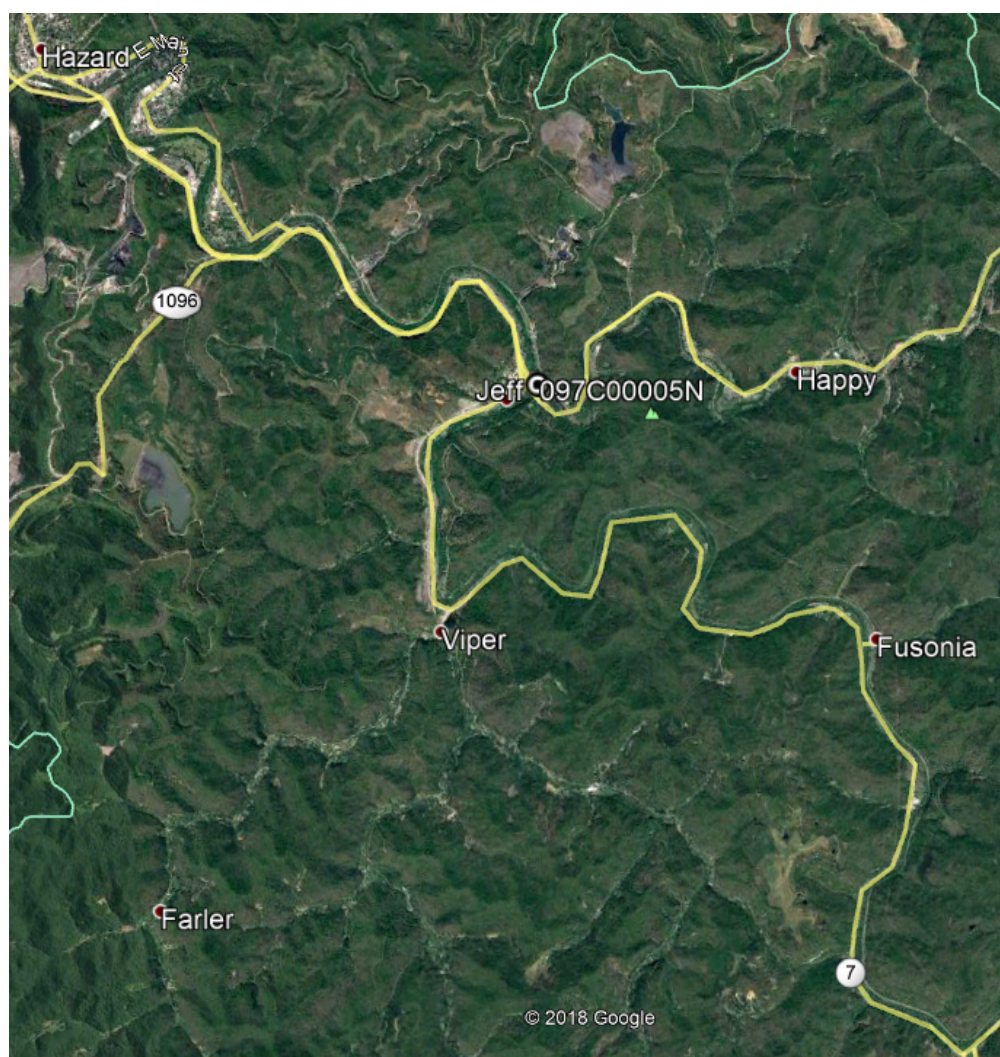


Figure 1. Google Image Showing Project Site.

REPORT OF GEOTECHNICAL EXPLORATION

October 21, 2019

2.0 SITE TOPOGRAPHY AND GEOLOGIC CONDITIONS

The project site is situated on the Geologic Map of the Hazard South Quadrangle, Kentucky (GQ-343). Based on the review of this geologic map, the project is underlain by alluvium. The alluvium consists of silt, sand, gravel and clay; buff to gray. Based on the mapping the alluvial deposits vary in thicknesses up to approximately 40 feet.

The Breathitt Formation, of the Lower and Middle Pennsylvanian geologic period, underlies the alluvium. The Breathitt Formation consists of cyclic sequences of siltstone, shale, sandstone and coal. The siltstone and shale are gray, weakly calcareous and evenly bedded. The sandstone is light gray, fine grained, interbedded with siltstone.

No detrimental geologic features are noted by the available mapping within the immediate vicinity of the bridge site.

3.0 FIELD INVESTIGATION

A geotechnical exploration was conducted in September of 2019 which consisted of two subsurface borings, designated herein as 097C00005N-1 and 097C00005N-2. The boring locations and surface elevations were obtained by the Bridging Kentucky TEAM and are presented in Appendix A. Table 1 provides a summary of the locations, elevations, and depths of the borings drilled for the proposed bridge.

Table 1. Bridge over North Fork Kentucky River– Summary of Borings

Hole No.	Latitude	Longitude	Surface Elevation (ft.) MSL	Top of Rock/Refusal		Begin Core		Bottom of Hole	
				Depth (ft.)	Elevation (ft.) MSL	Depth (ft.)	Elevation (ft.) MSL	Depth (ft.)	Elevation (ft.) MSL
097C00005N-1	37.206314	-83.131317	895.5	35.3	860.2	35.5	860.0	45.5	850.0
097C00005N-2	37.206638	-83.132065	896.2	35.2	861.0	35.2	861.0	45.2	851.0

The drill crew operated a truck-mounted drill rig equipped with hollow-stem and flight augers as well as wire line coring tools. The field personnel generally performed soil sampling at five-foot intervals of depth to obtain in situ strength data and specimens for subsequent laboratory strength and/or classification testing. Standard penetration testing (SPT) was conducted at both boring locations.

REPORT OF GEOTECHNICAL EXPLORATION

October 21, 2019

4.0 SUBSURFACE CONDITIONS

In general, the subsurface materials observed in the sample borings consist primarily of brown clayey gravel with sand that was moist and medium dense, and brown sandy lean clay overlying brown silty sand. Standard penetration test blow counts (N) in soil material ranged from 2 to 19 blows per foot. Soil thicknesses encountered ranged from 35.2 to 35.3 feet at the bridge location.

Based upon the rock coring performed, the top of bedrock is relatively flat and varied from a high elevation of 861.0 feet in Boring 097C00005N-2 to a low elevation of 860.2 feet in Boring 097C00005N-1. Bedrock specimens recovered from coring operations consist of sandstone. The sandstones are described as being light gray, fine grained, with shale streaks and stringers, becomes more silty/siltstone below approximately 42 feet. Detailed logs of the borings are presented in Appendix B.

Observation wells were not installed. Groundwater can be expected to be encountered at the level of North Fork Kentucky River. Groundwater levels and/or conditions may vary considerably, with time, according to the prevailing climate, rainfall or other factors.

5.0 LABORATORY TESTING AND RESULTS

Stantec performed laboratory testing on soil samples from the borings. All laboratory tests were performed in accordance with the applicable AASHTO or Kentucky Methods soil and rock testing specifications. Laboratory testing consisted of natural moisture content, grain size-sieve analyses (silt plus clay determinations), and soil classification index testing.

The SPT soil samples tested classify as CL, SM and GC according to USCS and A-4 and A-2-4 on the AASHTO classification system. Results of the laboratory testing are also presented in Appendix C.

6.0 ENGINEERING ANALYSES

6.1 GENERAL

This project will consist of replacing the existing bridge. No significant grading efforts are planned, as such, embankment stability or settlement analyses have been not performed. Any grading requirements or material placement that may be needed should be placed at 2H:1V slopes or flatter. Based on a combination of existing conditions and anticipated grades, recommendations for both spread footings or H-piles bearing on rock are being provided for support of the substructure elements of the subject structure.



REPORT OF GEOTECHNICAL EXPLORATION

October 21, 2019

6.2 BEARING CAPACITY FOR SPREAD FOOTINGS ON BEDROCK

Upon review of the boring logs, spread footings could be used as a foundation. Based on a review of the rock core logs and the quality of the bedrock encountered, a presumptive bearing resistance of 20,000 psf on unweathered bedrock is being recommended at the substructure locations in accordance with NAVFAC DM 7.2, page 7.2-142 for spread footings bearing on sedimentary rock at the service limit state.

Additional evaluation will be necessary if the designer's analyses of the nominal bearing resistance indicate the strength or extreme limit states control the footing design.

6.3 STEEL H-PILE ANALYSES

6.3.1 Pile Capacity

Based upon depths to top of rock, steel H-piles driven to bedrock could be used. As noted in Sections 3 and 4 of this report, existing foundation soils at the end bent locations vary in thickness from approximately 35.2 to 35.3 feet. Due to the nature of the soil deposits and the subsurface conditions observed at the site, an axial resistance factor (ϕ_c) of 0.6 is recommended for good driving conditions as outlined in Section 6.5.4.2 of the current LRFD Design Specifications. Using $\phi_c = 0.6$, the estimated total factored axial resistance for 12x53 H-piles is 465.0 kips.

6.3.2 Hammer Energy

Static pile analyses were conducted to estimate the ultimate driving resistance that 12-inch steel H-piles would experience during the installation process. Drivability analyses were performed at the End Bent locations. The analyses were performed using guidelines presented in the FHWA "Soils and Foundations Workshop Manual".

The soil column contributing to driving resistance at the End Bent locations includes existing embankment material and foundation soils down to rock. The pile is estimated to encounter silty clayey gravel with sand, sandy lean clay and silty sands with varying amounts of gravel down to bedrock. The results of FHWA research and other literature regarding pile installation indicate that significant reductions in skin resistances occur during pile driving, primarily due to the dynamics of the installation process. Soils are remolded and pore water pressures apparently increase, causing reductions in shear strengths. The driving resistances were estimated under the condition of no interruptions, and therefore no pile "set" characteristics would be experienced during the driving process.

The drivability analyses were conducted using the GRLWEAP (Version 2010) computer program for steel H-piles driven to bedrock. To perform the drivability analyses, two situations were modeled. The first one involved determining the minimum hammer energy which would drive the H-piles to refusal on bedrock without excessive blows, and which would achieve the maximum allowable pile capacity. This condition would show the minimum hammer energy necessary to seat the piles on bedrock. The second part of the analyses would determine what



REPORT OF GEOTECHNICAL EXPLORATION

October 21, 2019

the maximum hammer energy can be to drive the piles to refusal, and one which would not damage the pile upon achieving refusal on bedrock. The FHWA publication titled "Soils and Foundations Workshop Manual-Second Edition" defines a reasonable range of hammer blows to be between 30 and 144 blows per foot for a steel H-pile. The results of the driveability analyses indicate that a hammer with a minimum energy of 13.5 foot-kips and a maximum energy of 20.1 foot-kips will be required to drive 12x53 steel H-piles to practical refusal without encountering excessive blow counts or damaging the piles.

7.0 FOUNDATION SYSTEM RECOMMENDATIONS

Stantec developed the following recommendations based upon reviews of available data, information obtained during the field exploration, results of laboratory testing and engineering analyses, and discussions with TEAM personnel.

7.1 GENERAL

7.1.1. Based on a review of the existing subsurface conditions and anticipated structural loads, it is recommended that rock bearing foundation systems be used for all bridge substructure elements. The following table provides possible foundation alternates using the following notations.

1. = Spread Footings
2. = Point Bearing H-Piles

The foundation alternates shown below are those Stantec considers being most practical. However, other structural and/or economic considerations may dictate which option is most preferable.

Hole No.	Latitude	Longitude	Foundation Alternate	Top of Rock (feet)
097C00005N-1	37.206314	-83.131317	1, 2	860.2
097C00005N-2	37.206638	-83.132065	1, 2	861.0

REPORT OF GEOTECHNICAL EXPLORATION

October 21, 2019

7.1.2. Foundation excavations should be properly braced/shored to provide adequate safety to people working in or around the excavations. Bracing should be performed in accordance with applicable federal, state and local guidelines.

7.1.3. **A plan note should be included by the designer** that indicates that temporary shoring, sheeting, cofferdams, and/or dewatering methods may be required to facilitate foundation construction. It should be anticipated that groundwater will be encountered at foundation locations within the flood plain.

7.2 SPREAD FOOTINGS FOUNDATIONS

7.2.1. Rock-bearing spread footing options are being provided for substructure elements. Foundation excavations for footings at the structure locations should be level and free of loose, water softened material, etc. Additional rock excavation to achieve suitable bearing conditions may be required depending upon topography and bedrock weathering conditions.

7.2.2. **A plan note should be included by the designer** that indicates that solid rock excavation will be required for installation of the substructure's spread footings. The contractor shall take care during blasting and other excavation methods to avoid over-breakage and damage to the bedrock beneath the footings.

7.2.3. **A plan note should be included by the designer** that indicates that the bearing elevation of footings may be adjusted at the discretion of the Engineer if competent, unweathered bedrock is found at a higher elevation than specified for the respective substructure element. The top of new spread footings should be fully embedded into unweathered bedrock. The plan note should also state that the base of new footings must be placed on unweathered bedrock.

7.2.4. Prior to placement of any concrete or reinforcing steel in a foundation excavation, the excavation bottom should be clean and all soft, wet, or loose materials should be removed. In no case should concrete be placed upon compressible or water-softened materials.

7.2.5. **A plan note should be included by the designer** indicating that footings should be placed as soon as practical after completion of the footing excavation. If the bedrock becomes softened at bearing elevation, the softened material should be undercut to unweathered material prior to placement of reinforcing steel and concrete. Seasonal groundwater fluctuations may cause groundwater infiltration into the footing excavation, and a dewatering method may be necessary.

7.2.6. Any clay seams or suspect weak materials at or near the bearing elevation will need to be undercut and replaced with mass concrete.

7.2.7. Mass concrete shall be placed in the footing excavations from the top of footing to the bedrock surface where the footing does not extend to the bedrock surface.

REPORT OF GEOTECHNICAL EXPLORATION

October 21, 2019

7.3 STEEL H-PILE FOUNDATIONS

7.3.1. The following table provides recommended pile lengths applicable at the referenced substructure element locations. It is estimated that 12x53 H-pile foundations are being planned for use in supporting the new bridge substructure elements.

Hole No.	Total Factored Axial Resistance ^a (kips)	Estimated Bearing Elevation (ft) MSL
12x53 H-Pile	465	859.5
12x53 H-Pile	465	860.5

a. Obtained using $\phi=0.6$ based on good driving conditions.

7.3.2. **A plan note should be included by the designer** which states the following hammer criteria: At the End Bent locations, a diesel pile driving hammer with a rated energy between 13.5 foot-kips and 20.1 foot-kips will be required to drive 12x53 steel H-piles to practical refusal without encountering excessive blow counts or damaging the piles. The Contractor shall submit the proposed pile driving system to the Engineer for approval prior to the installation of the first pile. Approval of the pile driving system by the Engineer will be subject to satisfactory field performance of the pile driving procedures.

7.3.3. Stantec understands that end bearing piles are being driven to a practical refusal. **A plan note should be included by the designer** which indicates: For this project, minimum blow requirements may be reached after total penetration becomes 1/2 inch or less for ten consecutive blows, practical refusal is obtained after the pile is struck an additional ten blows with total penetration of 1/2 inch or less. Advance the production piling to the driving resistances specified above and to depths determined by test pile(s) and subsurface data sheet(s). Immediately cease driving operations if the pile visibly yields or becomes damaged during driving.

If hard driving is encountered because of dense strata or an obstruction, such as a boulder before the pile is advanced to the depth anticipated, the Engineer will determine if more blows than the average driving resistance specified for practical refusal is required to further advance the pile. Drive additional production and test piles if directed by the Engineer.

7.3.4. The design and installation of the pile foundations should conform to current AASHTO LRFD Bridge Design Specifications, and Section 604 of the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.

7.3.5. The Kentucky Transportation Cabinet recommends that protective pile points be used on end bearing piles to allow for embedment into the top of bedrock. Use of reinforced pile points capable of penetrating boulders and hard layers which may be encountered is recommended. Installation of pile points should be in accordance with Section 604 of the Kentucky Standard Specifications for Road and Bridge Construction, current edition.



REPORT OF GEOTECHNICAL EXPLORATION

October 21, 2019

7.3.6. The AASHTO LRFD Bridge Design Specifications recommend a resistance factor for horizontal geotechnical resistance of a single pile or pile group of 1.0 for lateral capacity analyses.

7.3.7. The 2014 AASHTO LRFD Bridge Design Specifications recommends axial resistance factors based on pile driving conditions (good or severe driving conditions). Based on the general subsurface conditions encountered across the project, it is anticipated that there will be good pile driving conditions. Therefore, it is recommended that the axial resistance of piles in compression (ϕ_c) used in design be 0.60. Further, the combined axial and flexural resistance factors for design should be $\phi_c = 0.70$ and $\phi_f = 1.00$ as noted in Section 6.5.4.2 of the referenced AASHTO specifications.

8.0 CLOSING

8.1. The conclusions and recommendations presented herein are based on data and subsurface conditions from the borings drilled during previous geotechnical exploration using that degree of care and skill ordinarily exercised under similar circumstances by competent members of the engineering profession. No warranties can be made regarding the continuity of conditions between borings.

8.2. General soil and rock descriptions and indicated boundaries are based on an engineering interpretation of all available subsurface information and may not necessarily reflect the actual variation in subsurface conditions between borings and samples.

8.3. The observed water levels and/or conditions indicated on the boring logs are as recorded at the time of exploration. These water levels and/or conditions may vary considerably, with time, according to the prevailing climate, rainfall, tail water elevations or other factors and are otherwise dependent on the duration of and methods used in the exploration program.


8.4. Stantec exercised sound engineering judgment in preparing the subsurface information presented herein. This information has been prepared and is intended for design and estimating purposes. Its presentation on the plans or elsewhere is for the purpose of providing intended users with access to the same information. This subsurface information interpretation is presented in good faith and is not intended as a substitute for independent interpretations or judgments of the Contractor.

8.5. All structure details shown herein are for illustrative purposes only and may not be indicative of the final design conditions shown in the contract plans.

APPENDIX A SITE MAP



LEGEND

 SOIL BORING WITH UNDISTURBED (SHELBY) TUBE SAMPLES
AND/OR STANDARD PENETRATION TESTS AND ROCK CORE

© 2019 Microsoft Corporation © 2019 DigitalGlobe ©CNES (2019) Distribution Airbus DS © 2019 HERE 



GRAPHIC SCALE: 1" = 50'		BRIDGING KENTUCKY	
DATE: 03/05/2019		BRIDGE: 097C00005N	PAGE NO. -
DRAWN BY: BMS	CKD. BY: DLB		
STANTEC JOB NO.: 178568003		SHEET: BRIDGE OVER NORTH FORK KENTUCKY RIVER PERRY COUNTY, KY	FIG. NO. -
FILE NAME:			

PLOT DATE: 09/16/2019 USER: SHELTON, BEN
V:\1785\ACTIVE\178568003\GEOTECHNICAL\097C00005N\DRAWING\097C00005N_LAYO.DWG

APPENDIX B TYPED BORING LOGS

Project ID: <u>178568003</u>		<u>Statewide - Various</u>			Project Type: <u>Structure Bridge</u>					
Item Number: <u>Statewide</u>					Project Manager: <u> </u>					
Hole Number <u>097C00005N-1</u>		Immediate Water Depth <u>NA</u>		Start Date <u>09/11/2019</u>		Hole Type <u>core and sample</u>				
Surface Elevation <u>895.5'</u>		Static Water Depth <u>NA</u>		End Date <u>09/11/2019</u>		Rig Number <u>45B</u>				
Total Depth <u>45.5'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.206314</u>						
Location <u>+ 'Lt.</u>				Longitude(83) <u>-83.131317</u>						
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks		
Elevation	Depth	Description	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	SDI (JS)			
894.3	1.2	Blacktop.								
891.5	4.0	Loose, brown, moist, clayey gravel with sand.	1	2.5-4.0	1.5	4-5-4	SPT			
5		Medium stiff, brown, moist, sandy lean clay.	2	5.0-6.5	1.5	3-3-4	SPT			
10			3	10.0-11.5	1.5	7-2-3	SPT			
15			4	15.0-16.5	1.5	4-3-5	SPT			
20	875.5		20.0	5	20.0-21.5	1.5	2-4-4		SPT	
25			Loose, brown, moist, silty sand with gravel.	6	25.0-26.5	1.5	1-2-3		SPT	
30				7	30.0-31.5	1.5	8-5-3		SPT	
35	860.2	35.3								
35	860.0	35.5	Sandstone (augered).		8	35.0-35.3	0.1		50/0.30'	SPT
40		Light gray sandstone, (fine grained with shale streaks and stringers, becoming more silty/siltstone below a depth of 42 feet).	90 / 90	5.0	4.9	98			40.5	
45	850.0		45.5	82 / 62	5.0	5.0	100			45.5
50		(Bottom of Hole 45.5')							50	

Project ID: <u>178568003</u>		<u>Statewide - Various</u>			Project Type: <u>Structure Bridge</u>									
Item Number: <u>Statewide</u>					Project Manager: <u> </u>									
Hole Number <u>097C00005N-2</u>		Immediate Water Depth <u>NA</u>		Start Date <u>09/12/2019</u>		Hole Type <u>core and sample</u>								
Surface Elevation <u>896.2'</u>		Static Water Depth <u>NA</u>		End Date <u>09/12/2019</u>		Rig Number <u>45B</u>								
Total Depth <u>45.2'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.206638</u>										
Location <u>+ 'Lt.</u>				Longitude(83) <u>-83.132065</u>										
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks					
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)		SDI (JS)				
895.1	1.1	Blacktop.												
5		Medium dense, brown, moist, clayey gravel with sand.		1	2.5-4.0	1.5	4-5-5	SPT						
				2	5.0-6.5	1.5	2-3-3	SPT						
				3	10.0-11.5	1.5	5-9-10	SPT						
				4	15.0-16.5	1.5	6-5-6	SPT						
				5	20.0-21.5	1.5	2-4-5	SPT						
				6	25.0-26.5	1.5	1-2-2	SPT						
				7	30.0-31.5	1.5	3-1-1	SPT						
				8	35.0-35.2	0.1	50/0.20'	SPT						
				78 / 72	5.0	5.0	100	40.2						
				94 / 92	5.0	5.0	100							
				861.0	35.2	(Begin Core)								45.2
				40	45.2	Light gray sandstone, (fine grained with shale streaks and stringers, becoming more silty/siltstone below a depth of 42.5 feet).								
						(Bottom of Hole 45.2')								50

APPENDIX C

LABORATORY DATA SHEETS



Gradation Analysis
AASHTO T 88

Project Name Bridging KY - 097C00005N

Source 097C00005N-1, 2.5'-4.0'

Preparation Method AASHTO T 11 Method A

Soak Time (min) 120

Particle Shape Angular

Particle Hardness Weathered and Friable

Sample Dry Mass (g) 499.65

Moisture Content (%) 10.5

Project Number 178568003

Lab ID 606

Date Received 09-18-2019

Preparation Date 09-24-2019

Test Date 10-03-2019

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
2"	0.00	0.0	100.0
1"	38.18	7.6	92.4
3/4"	11.80	2.4	90.0
3/8"	56.35	11.3	78.7
No. 4	48.86	9.8	68.9
No. 10	50.33	10.1	58.9
No. 40	51.42	10.3	48.6
No. 200	66.30	13.3	35.3
Pan	176.41	35.3	

% Gravel 41.1

% Sand 23.6

% Fines 35.3

Fines Classification N/A

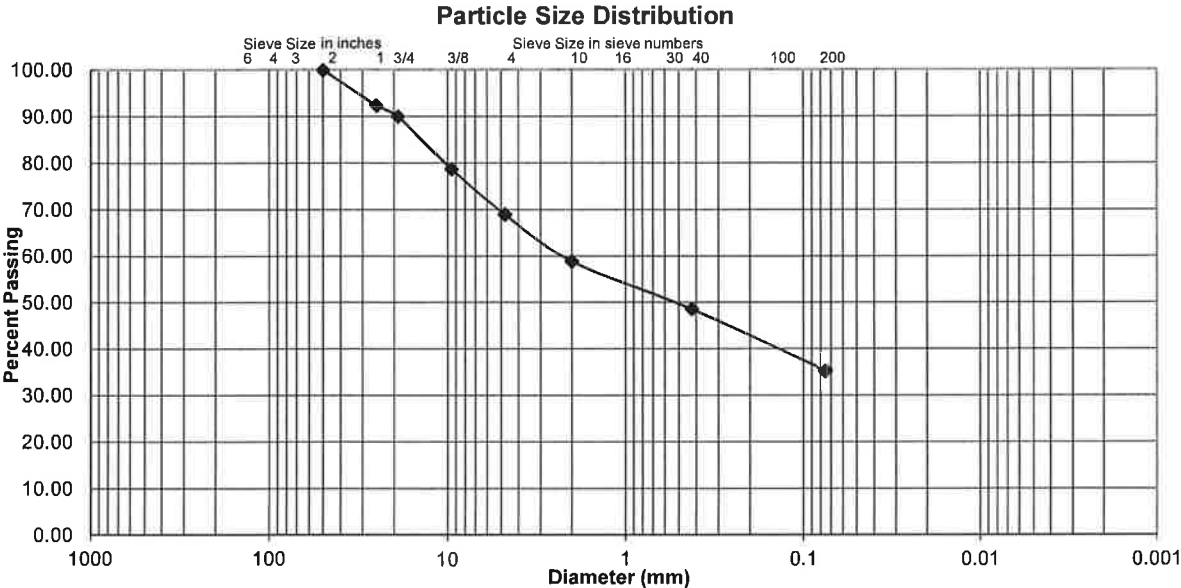
D₁₀ (mm) N/A

D₃₀ (mm) N/A

D₆₀ (mm) N/A

Cu N/A

Cc N/A



Comments

Reviewed By RJ



Summary of Soil Tests

Project Name Bridging KY - 097C00005N Project Number 178568003
Source 097C00005N-1, 5.0'-6.5', 10.0'-11.5' Lab ID 607
Sample Type SPT Composite Date Received 9-18-19
Date Reported 10-3-19

Test Results

Natural Moisture Content

Test Not Performed
Moisture Content (%): N/A

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry
Liquid Limit: 29
Plastic Limit: 19
Plasticity Index: 10
Activity Index: 0.7

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
1"	25	100.0
3/4"	19	98.7
3/8"	9.5	95.8
No. 4	4.75	90.6
No. 10	2	88.0
No. 40	0.425	83.9
No. 200	0.075	61.3
	0.02	37.8
	0.005	22.0
	0.002	14.4
estimated	0.001	9.4

Plus 3 in. material, not included: 0 (%)

Range	ASTM (%)	AASHTO (%)
Gravel	9.4	12.0
Coarse Sand	2.6	4.1
Medium Sand	4.1	---
Fine Sand	22.6	22.6
Silt	39.3	46.9
Clay	22.0	14.4

Moisture-Density Relationship

Test Not Performed
Maximum Dry Density (lb/ft³): N/A
Maximum Dry Density (kg/m³): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed
Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft³): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry
Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: CL
Group Name: Sandy lean clay
AASHTO Classification: A-4 (4)

Comments:

Reviewed By RJ



Particle-Size Analysis of Soils

AASHTO T 88

Project Name Bridging KY - 097C00005N
Source 097C00005N-1, 5.0'-6.5', 10.0'-11.5'

Project Number 178568003
Lab ID 607

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method AASHTO T 88
Prepared using AASHTO T 87

Particle Shape Angular
Particle Hardness: Hard and Durable

Tested By DB
Test Date 09-30-2019
Date Received 09-18-2019

Sieve Size	% Passing
1"	100.0
3/4"	98.7
3/8"	95.8
No. 4	90.6
No. 10	88.0

Maximum Particle size: 1" Sieve

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on -3 inch fraction only

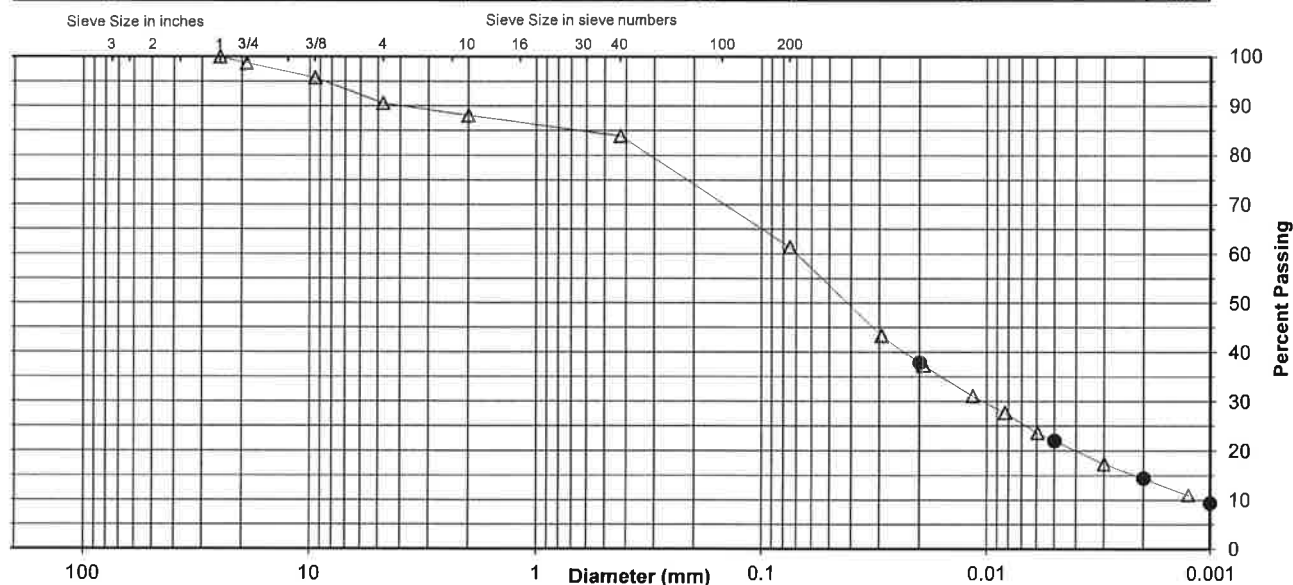
Specific Gravity 2.7

Dispersed using Apparatus A - Mechanical, for 1 minute

No. 40	83.9
No. 200	61.3
0.02 mm	37.8
0.005 mm	22.0
0.002 mm	14.4
0.001 mm	9.4

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	1.3	8.1	2.6	4.1	22.6	39.3	22.0
AASHTO	Gravel		Coarse Sand		Fine Sand	Silt	Clay
	12.0		4.1		22.6	46.9	14.4



Comments _____

Reviewed By RJ

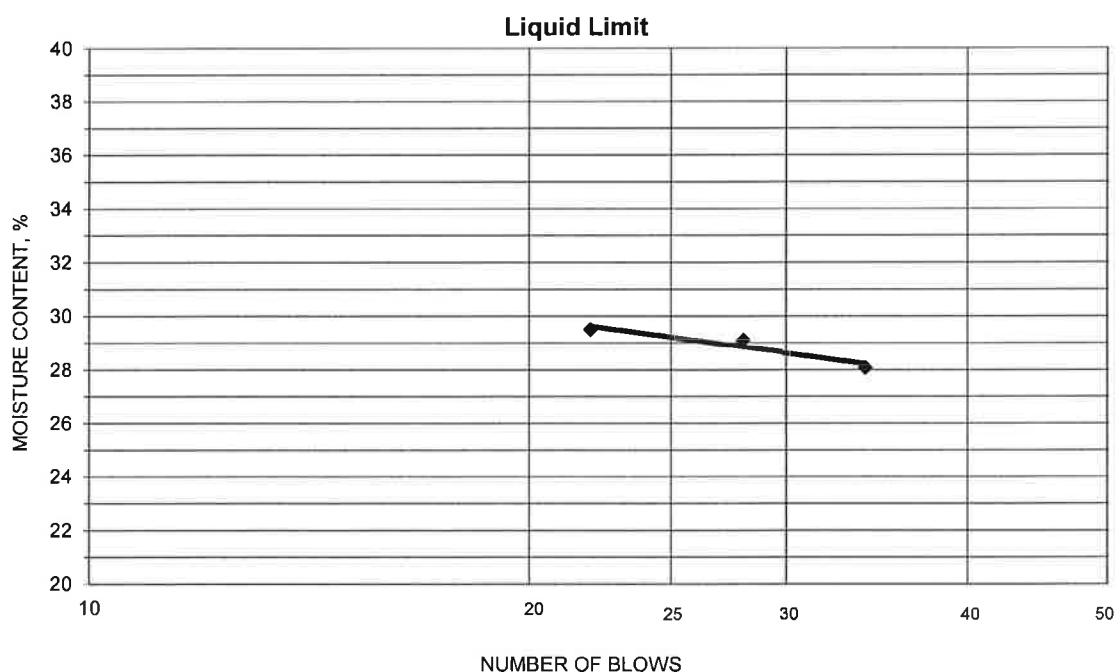


ATTERBERG LIMITS

Project Bridging KY - 097C00005N
Source 097C00005N-1, 5.0'-6.5', 10.0'-11.5'
Tested By DB Test Method AASHTO T 89 & T 90
Test Date 10-02-2019 Prepared Dry

Project No. 178568003
Lab ID 607
% + No. 40 16
Date Received 09-18-2019

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
21.89	19.46	11.11	28	29.1	29
20.39	18.15	10.56	22	29.5	
21.82	19.45	11.01	34	28.1	



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
19.29	17.91	10.77	19.3	19	10
18.86	17.56	10.80	19.2		

Remarks: _____

Reviewed By RJ



Gradation Analysis
AASHTO T 88

Project Name Bridging KY - 097C00005N

Source 097C00005N-1, 15.0'-16.5'

Preparation Method AASHTO T 11 Method A

Soak Time (min) 140

Particle Shape N/A

Particle Hardness N/A

Sample Dry Mass (g) 338.99

Moisture Content (%) 21.6

Project Number 178568003

Lab ID 610

Date Received 09-18-2019

Preparation Date 09-24-2019

Test Date 10-03-2019

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 10	0.00	0.0	100.0
No. 40	0.19	0.1	99.9
No. 200	85.16	25.1	74.8
Pan	253.64	74.8	---

% Gravel 0.0

% Sand 25.2

% Fines 74.8

Fines Classification N/A

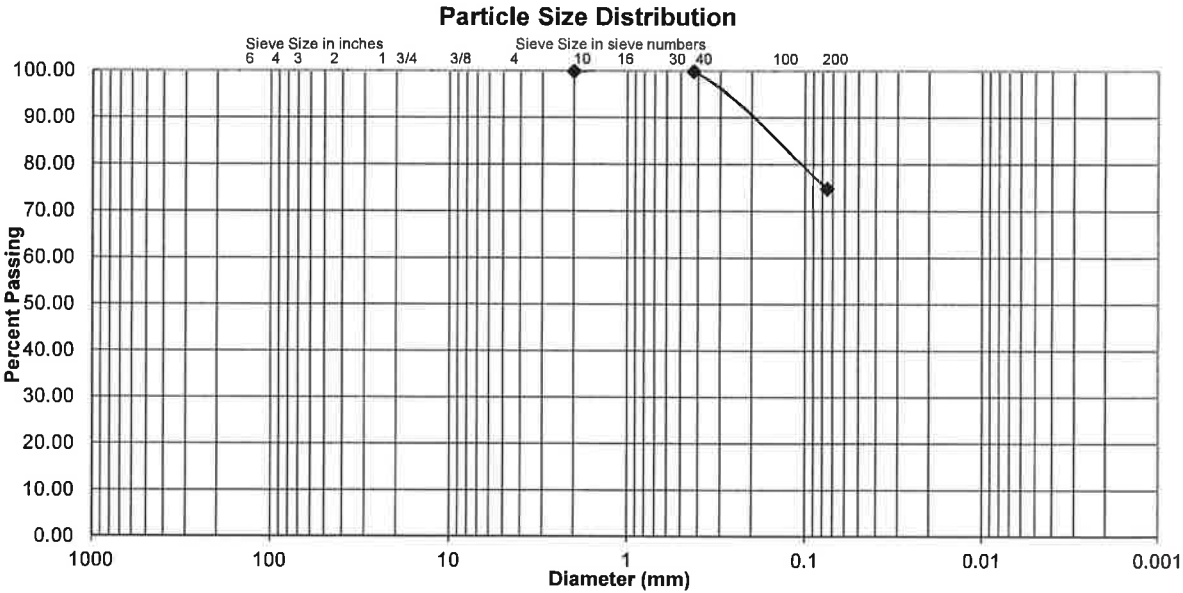
D₁₀ (mm) N/A

D₃₀ (mm) N/A

D₆₀ (mm) N/A

Cu N/A

Cc N/A



Comments

Reviewed By RJ



Gradation Analysis
AASHTO T 88

Project Name Bridging KY - 097C00005N

Source 097C00005N-1, 20.0'-21.5'

Preparation Method AASHTO T 11 Method A

Soak Time (min) 160

Particle Shape N/A

Particle Hardness N/A

Sample Dry Mass (g) 374.33

Moisture Content (%) 14.4

Project Number 178568003

Lab ID 611

Date Received 09-18-2019

Preparation Date 09-24-2019

Test Date 10-03-2019

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
No. 10	0.00	0.0	100.0
No. 40	0.28	0.1	99.9
No. 200	222.81	59.5	40.4
Pan	151.24	40.4	---

% Gravel 0.0

% Sand 59.6

% Fines 40.4

Fines Classification N/A

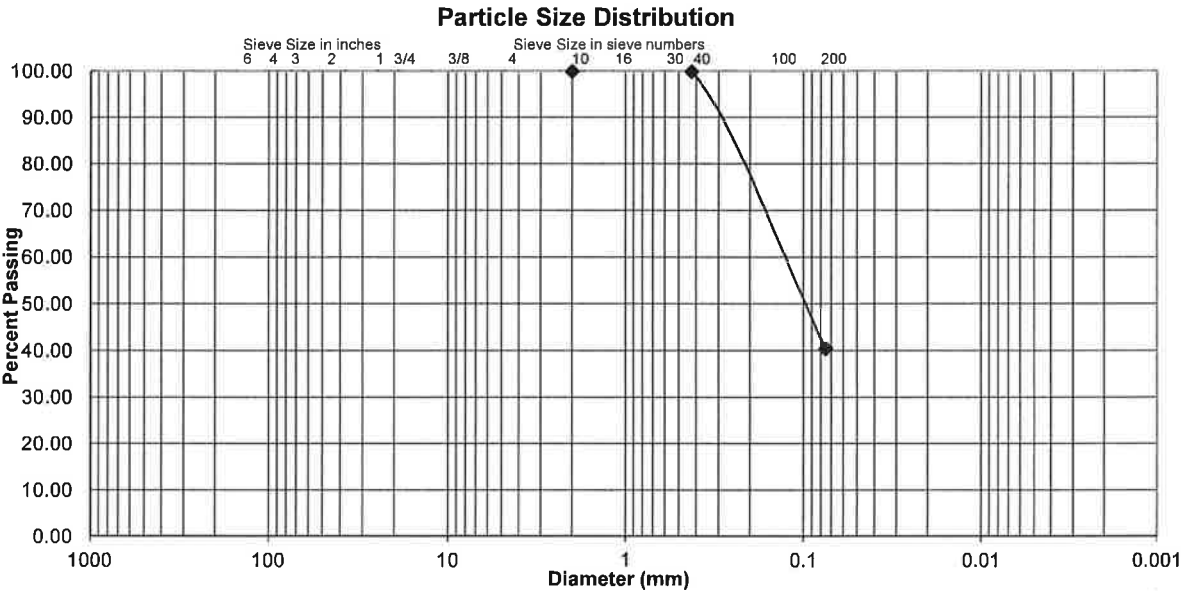
D₁₀ (mm) N/A

D₃₀ (mm) N/A

D₆₀ (mm) N/A

Cu N/A

Cc N/A



Comments

Reviewed By RJ



Summary of Soil Tests

Project Name Bridging KY - 097C00005N Project Number 178568003
Source 097C00005N-1, 25.0'-26.5', 30.0'-31.5' Lab ID 612
Sample Type SPT Composite Date Received 9-18-19
Date Reported 10-3-19

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Atterberg Limits

Test Method: AASHTO T 89 & T 90

Prepared: Dry

Liquid Limit: NP
Plastic Limit: NP
Plasticity Index: NP
Activity Index: N/A

Particle Size Analysis

Preparation Method: AASHTO T 87

Gradation Method: AASHTO T 88

Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
2"	50	100.0
1"	25	96.2
3/4"	19	89.7
3/8"	9.5	84.0
No. 4	4.75	82.9
No. 10	2	82.4
No. 40	0.425	79.8
No. 200	0.075	25.7
	0.02	13.4
	0.005	8.0
	0.002	5.5
estimated	0.001	4.2

Plus 3 in. material, not included: 0 (%)

Range	ASTM (%)	AASHTO (%)
Gravel	17.1	17.6
Coarse Sand	0.5	2.6
Medium Sand	2.6	---
Fine Sand	54.1	54.1
Silt	17.7	20.2
Clay	8.0	5.5

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft³): N/A
Maximum Dry Density (kg/m³): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft³): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: AASHTO T 100

Prepared: Dry

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.69

Classification

Unified Group Symbol: SM

Group Name: Silty sand with gravel

AASHTO Classification: A-2-4 (0)

Comments:

Reviewed By RJ



Particle-Size Analysis of Soils

AASHTO T 88

Project Name Bridging KY - 097C00005N
Source 097C00005N-1, 25.0'-26.5', 30.0'-31.5'

Project Number 178568003
Lab ID 612

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method AASHTO T 88
Prepared using AASHTO T 87

Particle Shape Rounded and Angular
Particle Hardness: Hard and Durable

Tested By DB
Test Date 09-30-2019
Date Received 09-18-2019

Sieve Size	% Passing
2"	100.0
1"	96.2
3/4"	89.7
3/8"	84.0
No. 4	82.9
No. 10	82.4

Maximum Particle size: 2" Sieve

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on -3 inch fraction only

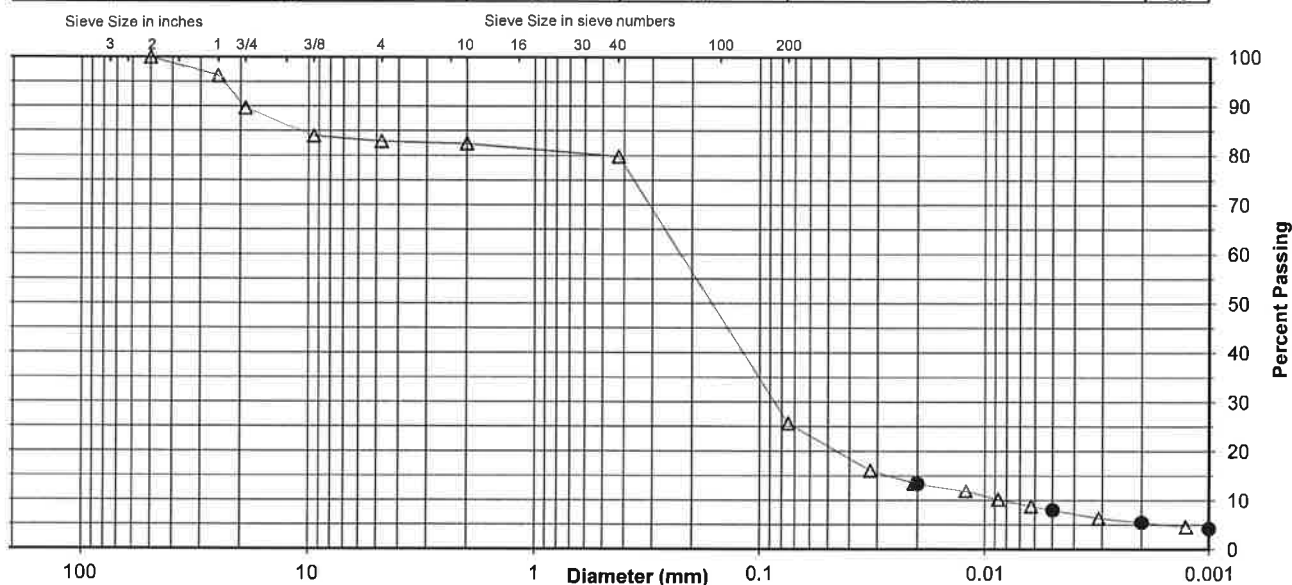
Specific Gravity 2.69

Dispersed using Apparatus A - Mechanical, for 1 minute

No. 40	79.8
No. 200	25.7
0.02 mm	13.4
0.005 mm	8.0
0.002 mm	5.5
0.001 mm	4.2

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	10.3	6.8	0.5	2.6	54.1	17.7	8.0
AASHTO	Gravel		Coarse Sand		Fine Sand	Silt	Clay
	17.6		2.6		54.1	20.2	5.5



Comments _____

Reviewed By RJ

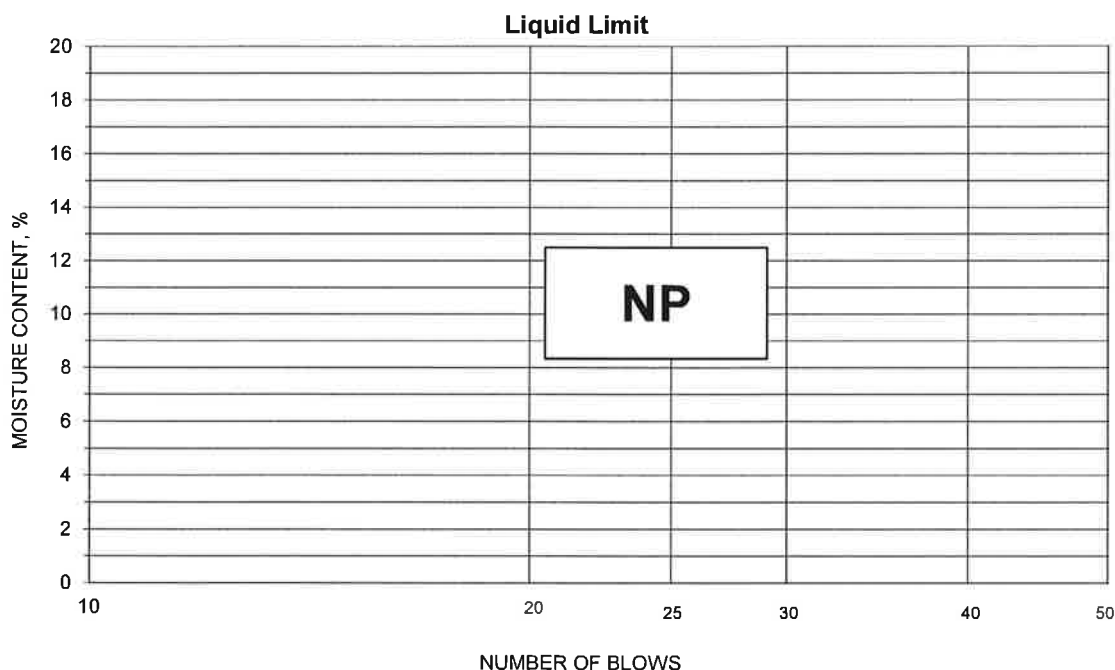


ATTERBERG LIMITS

Project Bridging KY - 097C00005N
Source 097C00005N-1, 25.0'-26.5', 30.0'-31.5'
Tested By KWS Test Method AASHTO T 89 & T 90
Test Date 10-01-2019 Prepared Dry

Project No. 178568003
Lab ID 612
% + No. 40 20
Date Received 09-18-2019

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index

Remarks: _____

Reviewed By RJ



Summary of Soil Tests

Project Name Bridging KY - 097C00005N Project Number 178568003
Source 097C00005N-2, 5.0'-6.5', 10.0'-11.5', 15.0'-16.5' Lab ID 617
Sample Type SPT Composite Date Received 9-18-19
Date Reported 10-3-19

Test Results

Natural Moisture Content

Test Not Performed
Moisture Content (%): N/A

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry
Liquid Limit: 25
Plastic Limit: 17
Plasticity Index: 8
Activity Index: 1.1

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		% Passing
Sieve Size	(mm)	
	N/A	
	N/A	
2"	50	100.0
1"	25	85.6
3/4"	19	79.6
3/8"	9.5	66.7
No. 4	4.75	60.4
No. 10	2	55.3
No. 40	0.425	50.1
No. 200	0.075	32.9
	0.02	19.7
	0.005	11.1
	0.002	7.4
estimated	0.001	5.4

Plus 3 in. material, not included: 0 (%)

Range	ASTM (%)	AASHTO (%)
Gravel	39.6	44.7
Coarse Sand	5.1	5.2
Medium Sand	5.2	---
Fine Sand	17.2	17.2
Silt	21.8	25.5
Clay	11.1	7.4

Moisture-Density Relationship

Test Not Performed
Maximum Dry Density (lb/ft³): N/A
Maximum Dry Density (kg/m³): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed
Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft³): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry
Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.73

Classification

Unified Group Symbol: GC
Group Name: Clayey gravel with sand
AASHTO Classification: A-2-4 (0)

Comments:

Reviewed By RJ



Particle-Size Analysis of Soils

AASHTO T 88

Project Name Bridging KY - 097C00005N
Source 097C00005N-2, 5.0'-6.5', 10.0'-11.5', 15.0'-16.5'

Project Number 178568003
Lab ID 617

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method AASHTO T 88
Prepared using AASHTO T 87

Particle Shape Rounded and Angular
Particle Hardness: Hard and Durable

Tested By DB
Test Date 09-30-2019
Date Received 09-18-2019

Sieve Size	% Passing
2"	100.0
1"	85.6
3/4"	79.6
3/8"	66.7
No. 4	60.4
No. 10	55.3

Maximum Particle size: 2" Sieve

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on -3 inch fraction only

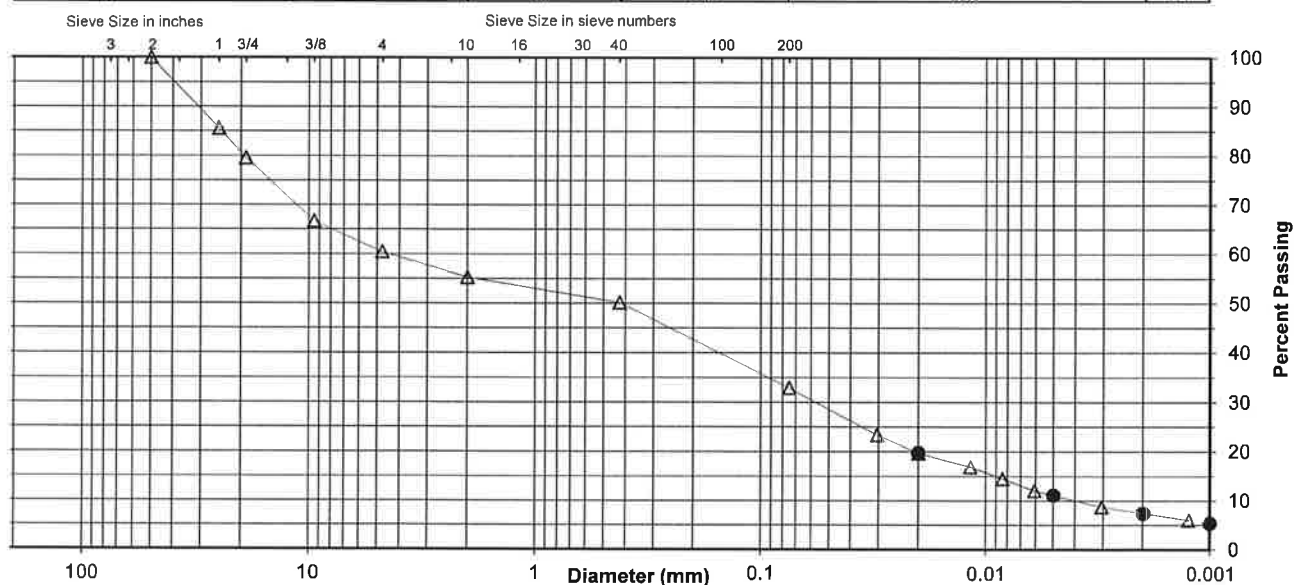
Specific Gravity 2.73

Dispersed using Apparatus A - Mechanical, for 1 minute

No. 40	50.1
No. 200	32.9
0.02 mm	19.7
0.005 mm	11.1
0.002 mm	7.4
0.001 mm	5.4

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	20.4	19.2	5.1	5.2	17.2	21.8	11.1
AASHTO	Gravel		Coarse Sand		Fine Sand	Silt	Clay
	44.7		5.2		17.2	25.5	7.4



Comments _____

Reviewed By RJ

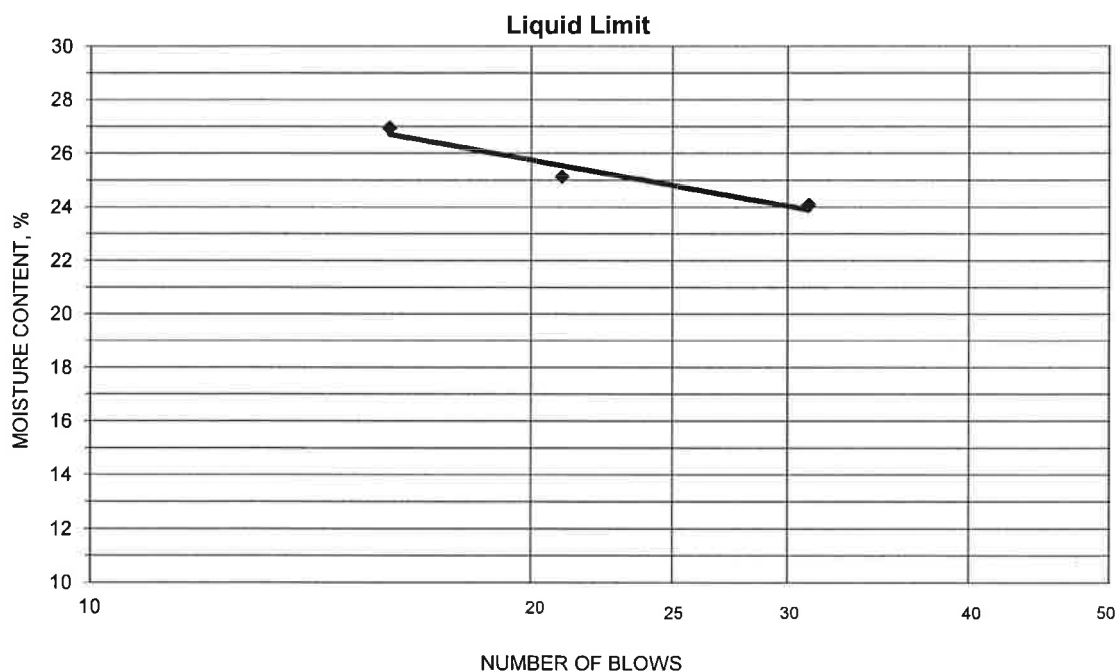


ATTERBERG LIMITS

Project Bridging KY - 097C00005N
Source 097C00005N-2, 5.0'-6.5', 10.0'-11.5', 15.0'-16.5'
Tested By DB Test Method AASHTO T 89 & T 90
Test Date 10-02-2019 Prepared Dry

Project No. 178568003
Lab ID 617
% + No. 40 50
Date Received 09-18-2019

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
21.32	19.13	11.00	16	26.9	25
22.32	20.10	11.27	21	25.1	
22.82	20.55	11.12	31	24.1	



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
20.65	19.22	11.04	17.5	17	8
19.19	18.08	11.55	17.0		

Remarks: _____

Reviewed By RJ



Gradation Analysis
AASHTO T 88

Project Name Bridging KY - 097C00005N
Source 097C00005N-2, 20.0'-21.5'
Preparation Method AASHTO T 11 Method A
Soak Time (min) 200
Particle Shape Angular
Particle Hardness Weathered and Friable
Sample Dry Mass (g) 408.99
Moisture Content (%) 13.4

Project Number 178568003
Lab ID 621
Date Received 09-18-2019
Preparation Date 09-24-2019
Test Date 10-03-2019

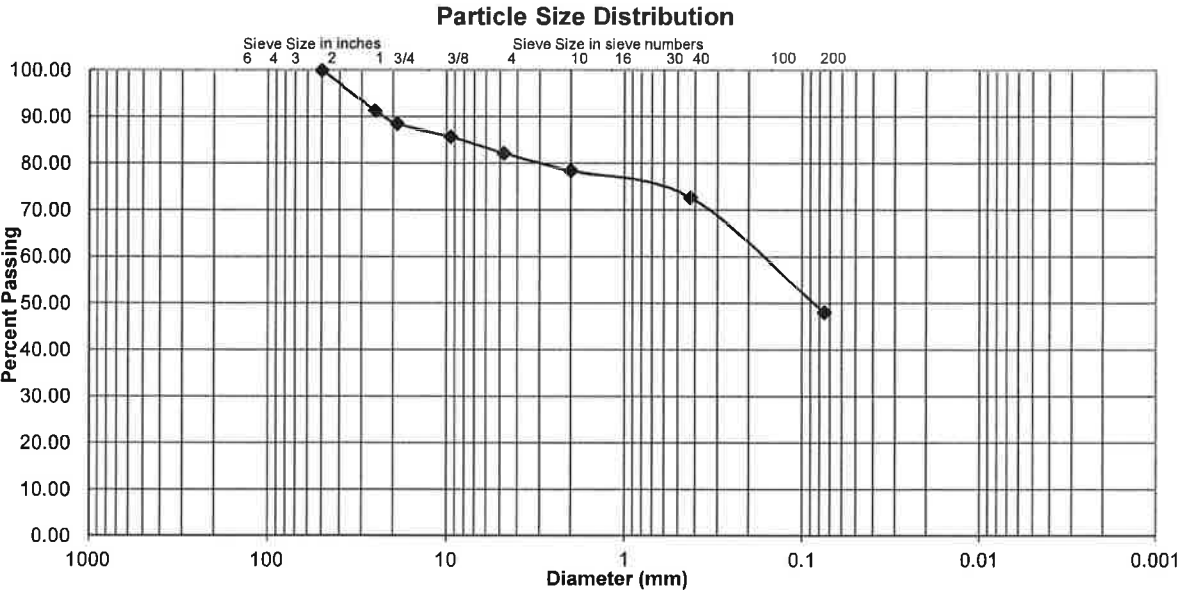
Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
2"	0.00	0.0	100.0
1"	35.62	8.7	91.3
3/4"	11.34	2.8	88.5
3/8"	11.37	2.8	85.7
No. 4	14.70	3.6	82.1
No. 10	15.27	3.7	78.4
No. 40	23.35	5.7	72.7
No. 200	100.88	24.7	48.0
Pan	196.46	48.0	---

% Gravel 21.6
% Sand 30.4
% Fines 48.0
Fines Classification N/A

D₁₀ (mm) N/A
D₃₀ (mm) N/A
D₆₀ (mm) N/A

Cu N/A
Cc N/A



Comments _____

Reviewed By RJ



Summary of Soil Tests

Project Name Bridging KY - 097C00005N Project Number 178568003
Source 097C00005N-2, 25.0'-26.5', 30.0'-31.5' Lab ID 622
Sample Type SPT Composite Date Received 9-18-19
Date Reported 10-3-19

Test Results

Natural Moisture Content

Test Not Performed
Moisture Content (%): N/A

Atterberg Limits

Test Method: AASHTO T 89 & T 90
Prepared: Dry
Liquid Limit: NP
Plastic Limit: NP
Plasticity Index: NP
Activity Index: N/A

Particle Size Analysis

Preparation Method: AASHTO T 87
Gradation Method: AASHTO T 88
Hydrometer Method: AASHTO T 88

Particle Size		%
Sieve Size	(mm)	Passing
	N/A	
	N/A	
	N/A	
1"	25	100.0
3/4"	19	95.8
3/8"	9.5	92.5
No. 4	4.75	91.7
No. 10	2	90.8
No. 40	0.425	88.0
No. 200	0.075	22.8
	0.02	12.4
	0.005	7.5
	0.002	4.8
estimated	0.001	2.9

Plus 3 in. material, not included: 0 (%)

Range	ASTM (%)	AASHTO (%)
Gravel	8.3	9.2
Coarse Sand	0.9	2.8
Medium Sand	2.8	---
Fine Sand	65.2	65.2
Silt	15.3	18.0
Clay	7.5	4.8

Moisture-Density Relationship

Test Not Performed
Maximum Dry Density (lb/ft³): N/A
Maximum Dry Density (kg/m³): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed
Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft³): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: AASHTO T 100
Prepared: Dry
Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.65

Classification

Unified Group Symbol: SM
Group Name: Silty sand
AASHTO Classification: A-2-4 (0)

Comments:

Reviewed By RJ



Particle-Size Analysis of Soils

AASHTO T 88

Project Name Bridging KY - 097C00005N
Source 097C00005N-2, 25.0'-26.5', 30.0'-31.5'

Project Number 178568003
Lab ID 622

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method AASHTO T 88
Prepared using AASHTO T 87

Particle Shape Rounded
Particle Hardness: Hard and Durable

Tested By DB
Test Date 09-30-2019
Date Received 09-18-2019

Sieve Size	% Passing
1"	100.0
3/4"	95.8
3/8"	92.5
No. 4	91.7
No. 10	90.8

Maximum Particle size: 1" Sieve

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on -3 inch fraction only

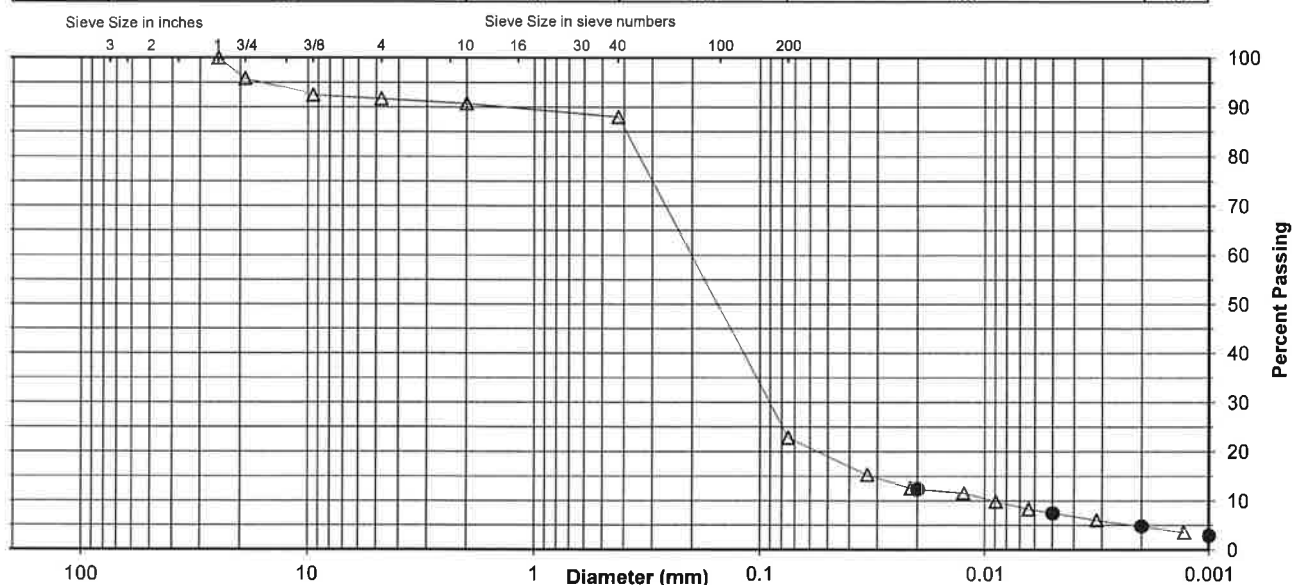
Specific Gravity 2.65

Dispersed using Apparatus A - Mechanical, for 1 minute

No. 40	88.0
No. 200	22.8
0.02 mm	12.4
0.005 mm	7.5
0.002 mm	4.8
0.001 mm	2.9

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	4.2	4.1	0.9	2.8	65.2	15.3	7.5
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	9.2			2.8	65.2	18.0	4.8



Comments _____

Reviewed By RJ

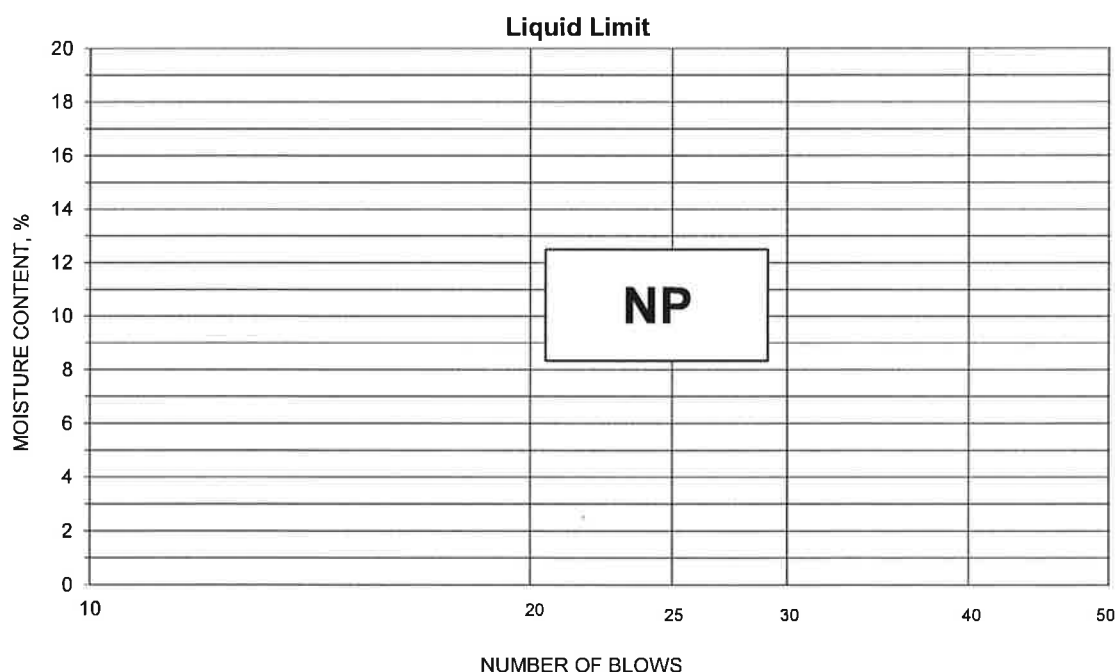


ATTERBERG LIMITS

Project Bridging KY - 097C00005N
Source 097C00005N-2, 25.0'-26.5', 30.0'-31.5'
Tested By KWS Test Method AASHTO T 89 & T 90
Test Date 10-01-2019 Prepared Dry

Project No. 178568003
Lab ID 622
% + No. 40 12
Date Received 09-18-2019

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index

Remarks: _____

Reviewed By RJ



Moisture Content of Soil

AASHTO T 265

Project Name Bridging KY - 097C00005N

Project Number 178568003
Tested By DB

Test Method AASHTO

Maximum Particle Size in Sample	No. 40	No. 4	1/2"	1"	2"
Recommended Minimum Mass (g)	10	100	300	500	1,000

Material Type: Stratified, Laminated, Lensed, Homogeneous, Disturbed

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & Can Weight (g)	Moisture Content (%)
097C00005N-1, 2.5'-4.0'	606	9/24/19	Len	2"		No	304.75	857.08	804.40	10.5
097C00005N-1, 5.0'-6.5'	608	9/24/19	Len	2"		No	30.33	205.29	185.47	12.8
097C00005N-1, 10.0'-11.5'	609	9/24/19	Hom	No. 4		Yes	30.25	184.03	157.96	20.4
097C00005N-1, 15.0'-16.5'	610	9/24/19	Hom	No. 4		Yes	309.62	722.00	648.61	21.6
097C00005N-1, 20.0'-21.5'	611	9/24/19	Hom	No. 4		Yes	293.77	721.94	668.10	14.4
097C00005N-1, 25.0'-26.5'	613	9/24/19	Dist	No. 4		Yes	29.60	203.90	182.56	14.0
097C00005N-1, 30.0'-31.5'	614	9/24/19	Len	2"	2	No	30.71	208.63	186.92	13.9
097C00005N-1, 35.0'-35.3'	615	9/24/19	Len	1/2"		No	31.19	96.99	89.86	12.2
097C00005N-2, 2.5'-4.0'	616	9/24/19	Len	1"		No	29.96	209.51	191.88	10.9
097C00005N-2, 5.0'-6.5'	618	9/24/19	Len	1"	3	No	31.61	184.67	169.37	11.1
097C00005N-2, 10.0'-11.5'	619	9/24/19	Len	1"		No	30.39	194.32	179.12	10.2
097C00005N-2, 15.0'-16.5'	620	9/24/19	Len	1"		No	30.94	203.06	187.82	9.7
097C00005N-2, 20.0'-21.5'	621	9/24/19	Len	1"		No	310.08	773.91	719.07	13.4
097C00005N-2, 25.0'-26.5'	623	9/24/19	Dist	1"	2	No	30.29	178.19	163.20	11.3
097C00005N-2, 30.0'-31.5'	624	9/24/19	Dist	No. 4		Yes	31.51	172.69	152.56	16.6
097C00005N-2, 35.0'-35.2'	625	9/24/19	Dist	No. 4		No	29.98	126.06	113.84	14.6

Comments

Reviewed By

RJ

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 2019* and *Standard Drawings, Edition of 2020*.

SUPPLEMENTAL SPECIFICATIONS

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

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

SPECIAL NOTE FOR PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

2.0 MATERIALS.

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

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

2.2 Sign and Controls. All signs must:

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

11

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

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

*Insert numerals as directed by the Engineer.

Add other messages during the project when required by the Engineer.

2.3 Power.

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

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

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

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

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

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

11
the actual number of individual signs acceptably furnished and operated during the project. The Department will not measure signs replaced due to damage or rejection.

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

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

Effective June 15, 2012

SPECIAL 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:

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
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
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

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 contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

- (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
- (2) the prime contractor remains responsible for the quality of the work of the leased employees;
- (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
- (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is

evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.

2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. Instructions for Certification – First Tier Participants:

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this

covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which

this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS
PREFERENCE FOR APPALACHIAN DEVELOPMENT
HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS
ROAD CONTRACTS**

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

**KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS**

**EMPLOYMENT REQUIREMENTS
RELATING TO
NONDISCRIMINATION OF EMPLOYEES
(APPLICABLE TO FEDERAL-AID SYSTEM CONTRACTS)**

**AN ACT OF THE KENTUCKY GENERAL ASSEMBLY
TO PREVENT DISCRIMINATION IN EMPLOYMENT**

**KRS CHAPTER 344
EFFECTIVE JUNE 16, 1972**

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

1. The contractor shall not fail or refuse to hire, or shall not discharge any individual, or otherwise discriminate against an individual with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's race, color, religion, national origin, sex, disability or age (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 administering 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: KY20220107 01/07/2022

Superseded General Decision Number: KY20210107

State: Kentucky

Construction Type: Highway

Counties: Adair, Barren, Bell, Breathitt, Casey, Clay, Clinton, Cumberland, Estill, Floyd, Garrard, Green, Harlan, Hart, Jackson, Johnson, Knott, Knox, Laurel, Lawrence, Lee, Leslie, Letcher, Lincoln, Magoffin, Martin, McCreary, Menifee, Metcalfe, Monroe, Morgan, Owsley, Perry, Pike, Powell, Pulaski, Rockcastle, Russell, Taylor, Wayne, Whitley and Wolfe Counties in Kentucky.

HIGHWAY CONSTRUCTION PROJECTS

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022, Executive Order 14026 generally applies to the contract. The contractor must pay all covered workers at least \$15.00 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2022.

If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022, Executive Order 13658 generally applies to the contract. The contractor must pay all covered workers at least \$11.25 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2022.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at www.dol.gov/whd/govcontracts.

Modification Number

0

Publication Date

01/07/2022

KY20220107 Mod 0 - 01/07/2022

SUKY2015-047 10/20/2015

	Rates	Fringes
BOILERMAKER.....	\$ 24.65	12.94
BRICKLAYER		
Bricklayer.....	\$ 22.90	8.50
Stone Mason.....	\$ 21.50	8.50
CARPENTER		
Carpenter.....	\$ 24.90	14.50
Piledriver.....	\$ 24.55	14.50
CEMENT MASON.....	\$ 21.25	8.50
ELECTRICIAN		
Electrician.....	\$ 29.36	10.55
Equipment Operator.....	\$ 26.90	10.31
Groundsman.....	\$ 17.79	8.51
Lineman.....	\$ 30.09	10.94
When workmen are required to work from bosum chairs, trusses, stacks, tanks, scaffolds, catwalks, radio and T.V. towers, structural steel (open, unprotected, unfloored raw steel), and bridges or similar hazardous locations where workmen are subject to fall, except where using JLG's and bucket trucks up to 75 feet: Add 25% to workman's base rate for 50 to 75 feet, and add 50% to workman's base rate for over 75 feet.		
IRONWORKER.....	\$ 27.56	20.57
LABORER		
Group 1.....	\$ 21.80	12.36
Group 2.....	\$ 22.05	12.36
Group 3.....	\$ 22.10	12.36
Group 4.....	\$ 22.70	12.36

GROUP 1: Aging and Curing of Concrete (Any Mode or Method), Asbestos Abatement Worker, Asphalt Plant Laborers, Asphalt Laborers, Batch Truck Dumpers, Carpenter Tenders, Cement Mason Tenders, Cleaning of Machines, Concrete Laborers, Demolition Laborers, Dredging Laborers, Drill Tender, Environmental Laborer - Nuclear, Radiation, Toxic and Hazardous Waste - Level D, Flagmen, Grade Checkers, All Hand Digging and Hand Back Filling, Highway Marker Placers, Landscaping Laborers, Mesh Handlers and Placers, Puddler, Railroad Laborers, Rip-rap and Grouters, Right of Way Laborers, Sign, Guard Rail and Fence Installers (All Types), Signalmen, Sound Barrier Installer, Storm and Sanitary Sewer Laborers, Swampers, Truck Spotters and Dumpers, Wrecking of Concrete Forms, General Cleanup

GROUP 2: Batter Board Men (Sanitary and Storm Sewer), Brickmason Tenders, Mortar Mixer Operator, Scaffold Builders, Burner and Welder, Bushammers, Chain Saw Operator, Concrete Saw Operators, Deckhand Scow Man, Dry Cement Handlers,

Environmental Laborers - Nuclear, Radiation, Toxic and Hazardous Waste - Level C, Forklift Operators for Masonry, Form Setters, Green Concrete Cutting, Hand Operated Grouter and Grinder Machine Operator, Jack Hammers, Lead Paint Abatement, Pavement Breakers, Paving Joint Machine, Pipe Layers - Laser Operators (Non-metallic), Plastic Pipe Fusion, Power Driven Georgia Buggy and Wheel Barrow, Power Post Hole Diggers, Precast Manhole Setters, Walk-behind Tampers, Walk-behind Trenchers, Sand Blasters, Concrete Chippers, Surface Grinders, Vibrator Operators, Wagon Drillers

GROUP 3: Air Track Driller (All Types), Asphalt Luteman and Rakers, Gunnite Nozzleman, Gunnite Operators and Mixers, Grout Pump Operator, Powderman and Blaster, Side Rail Setters, Rail Paved Ditches, Screw Operators, Tunnel Laborers (Free Air), Water Blasters

GROUP 4: Caisson Workers (Free Air), Cement Finishers, Environmental Laborer - Nuclear, Radiation, Toxic and Hazardous Waste - Level A and B, miners and Drillers (Free Air), Tunnel Blasters, and Tunnel Mockers (Free Air), Directional and Horizontal Boring, Air Track Drillers (All Types), Powder Man and Blasters, Troxler and Concrete Tester if Laborer is Utilized

PAINTER

All Excluding Bridges.....	\$ 19.92	9.57
Bridges.....	\$ 23.92	10.07

PLUMBER.....	\$ 22.52	7.80
--------------	----------	------

POWER EQUIPMENT OPERATOR:

Group 1.....	\$ 29.95	14.40
Group 2.....	\$ 29.95	14.40
Group 3.....	\$ 27.26	14.40
Group 4.....	\$ 26.96	14.40

GROUP 1: Auto Patrol, Batcher Plant, Bituminous Paver, Cable-Way, Clamshell, Concrete Mixer (21 cu ft or over), Concrete Pump, Crane, Crusher Plant, Derrick, Derrick Boat, Ditching and Trenching Machine, Dragline, Dredge Engineer, Elevator (regardless of ownership when used for hoisting any building material), Elevating Grader and all types of Loaders, Hoe-type Machine, Hoisting Engine, Locomotive, LeTourneau or Carry-all Scoop, Bulldozer, Mechanic, Orangepeel Bucket, Piledriver, Power Blade, Roller (Bituminous), Roller (Earth), Roller (Rock), Scarifier, Shovel, Tractor Shovel, Truck Crane, Well Point, Winch Truck, Push Dozer, Grout Pump, High Lift, Fork Lift (regardless of lift height), all types of Boom Cats, Multiple Operator, Core Drill, Tow or Push Boat, A-Frame Winch Truck, Concrete Paver, Grade-All, Hoist, Hyster, Material Pump, Pumpcrete, Ross Carrier, Sheepfoot, Sideboom, Throttle-Valve Man, Rotary Drill, Power Generator, Mucking Machine, Rock Spreader attached to Equipment, Scoopmobile, KeCal Loader, Tower Cranes, (French, German and other types), Hydrocrane, Tugger, Backfiller Gurries, Self-propelled Compactor, Self-Contained Hydraulic Percussion Drill

GROUP 2: All Air Compressors (200 cu ft/min or greater), Bituminous Mixer, Concrete Mixer (21 cu. ft. or over), Welding Machine, Form Grader, Tractor (50 hp and over), Bull Float, Finish Machine, Outboard Motor Boat, Brakeman, Mechanic Tender, Whirly Oiler, Tract-air, Road Widening Trencher, Articulating Trucks

GROUP 3: Greaser on Grease Facilities servicing Heavy Equipment

GROUP 4: Bituminous Distributor, Cement Gun, Conveyor, Mud Jack, Paving Joint Machine, Pump, Tamping Machine, Tractor (under 50 hp), Vibrator, Oiler, Air Compressor (under 200 cu ft per minute), Concrete Saw, Burlap and Curing Machine, Hydro Seeder, Power Form Handling Equipment, Deckhand Oiler, Hydraulic Post Driver

SHEET METAL WORKER.....	\$ 20.40	7.80
TRUCK DRIVER		
Driver (3 Tons and Over), Driver (Truck Mounted Rotary Drill).....	\$ 23.74	14.50
Driver (3 Tons and Under), Tire Changer and Truck Mechanic Tender.....	\$ 23.53	14.50
Driver (Semi-Trailer or Pole Trailer), Driver (Dump Truck, Tandem Axle), Driver of Distributor.....	\$ 23.40	14.50
Driver on Mixer Trucks (All Types).....	\$ 23.45	14.50
Driver on Pavement Breakers.	\$ 23.55	14.50
Driver, Euclid and Other Heavy Earth Moving Equipment and Low Boy.....	\$ 24.31	14.50
Driver, Winch Truck and A- Frame when used in Transporting Materials.....	\$ 23.30	14.50
Greaser on Greasing Facilities.....	\$ 24.40	14.50
Truck Mechanic.....	\$ 23.50	14.50
Truck Tender and Warehouseman.....	\$ 23.20	14.50

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

=====
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 Division National Office Branch of Wage Surveys. 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.

=====

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 to an employee at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty (40) hours in such workweek. 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
7.0%	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 Perry County.

PART IV

INSURANCE

Refer to
Kentucky Standard Specifications for Road and Bridge Construction,
current edition

PART V

BID ITEMS

Report Date 1/26/22

Section: 0001 - PAVING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00001		DGA BASE	172.00	TON		\$	
0020	00100		ASPHALT SEAL AGGREGATE	2.00	TON		\$	
0030	00103		ASPHALT SEAL COAT	1.00	TON		\$	
0040	00212		CL2 ASPH BASE 1.00D PG64-22	97.00	TON		\$	
0050	00301		CL2 ASPH SURF 0.38D PG64-22	18.00	TON		\$	

Section: 0002 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0060	01691		FLUME INLET TYPE 2	2.00	EACH		\$	
0070	01987		DELINEATOR FOR GUARDRAIL BI DIRECTIONAL WHITE	12.00	EACH		\$	
0080	02223		GRANULAR EMBANKMENT	60.00	CUYD		\$	
0090	02265		REMOVE FENCE	50.00	LF		\$	
0100	02351		GUARDRAIL-STEEL W BEAM-S FACE	125.00	LF		\$	
0110	02360		GUARDRAIL TERMINAL SECTION NO 1	2.00	EACH		\$	
0120	02367		GUARDRAIL END TREATMENT TYPE 1	2.00	EACH		\$	
0130	02399		EXTRA LENGTH GUARDRAIL POST	16.00	EACH		\$	
0140	02483		CHANNEL LINING CLASS II	27.00	TON		\$	
0150	02545		CLEARING AND GRUBBING APPROXIMATELY LESS THAN 1 ACRE	1.00	LS		\$	
0160	02585		EDGE KEY	40.00	LF		\$	
0170	02602		FABRIC-GEOTEXTILE CLASS 1	43.00	SQYD		\$	
0180	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		\$	
0190	02671		PORTABLE CHANGEABLE MESSAGE SIGN	4.00	EACH		\$	
0200	02726		STAKING	1.00	LS		\$	
0210	02731		REMOVE STRUCTURE	1.00	LS		\$	
0220	02731		REMOVE STRUCTURE BLOCK SHED	1.00	LS		\$	
0230	21415ND		EROSION CONTROL	1.00	LS		\$	
0240	25079ED		THRIE BEAM GUARDRAIL TRANSITION TL-2	4.00	EACH		\$	

Section: 0003 - BRIDGE - 097C00005N

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0250	03299		ARMORED EDGE FOR CONCRETE	41.00	LF		\$	
0260	08002		STRUCTURE EXCAV-SOLID ROCK	110.00	CUYD		\$	
0270	08003		FOUNDATION PREPARATION	1.00	LS		\$	
0280	08019		CYCLOPEAN STONE RIP RAP	1,073.00	TON		\$	
0290	08033		TEST PILES	66.00	LF		\$	
0300	08046		PILES-STEEL HP12X53	357.00	LF		\$	
0310	08094		PILE POINTS-12 IN	14.00	EACH		\$	
0320	08100		CONCRETE-CLASS A	271.00	CUYD		\$	
0330	08104		CONCRETE-CLASS AA	224.00	CUYD		\$	
0340	08150		STEEL REINFORCEMENT	59,259.00	LB		\$	

Report Date 1/26/22

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0350	08151		STEEL REINFORCEMENT-EPOXY COATED	99,883.00	LB		\$	
0360	08160		STRUCTURAL STEEL Approx. 12,614 lbs	1.00	LS		\$	
0370	23378EC		CONCRETE SEALING	14,165.00	SQFT		\$	
0380	23380EC		BEARING PADS	12.00	EACH		\$	
0390	24520EC		PPC I-BEAM HN 48-49	789.00	LF		\$	
0400	25028ED		RAIL SYSTEM SINGLE SLOPE - 40 IN	534.00	LF		\$	

Section: 0004 - WATERLINE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0410	14003		W CAP EXISTING MAIN	2.00	EACH		\$	
0420	14004		W DIRECTIONAL BORE	600.00	LF		\$	
0430	14031		W METER VAULT	1.00	EACH		\$	
0440	14095		W TIE-IN 08 INCH	2.00	EACH		\$	
0450	14106		W VALVE 08 INCH	1.00	EACH		\$	
0460	14511		W FLUSH HYDRANT ASSEMBLY INST	1.00	EACH		\$	

Section: 0005 - DEMOBILIZATION &/OR MOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0470	02568		MOBILIZATION	1.00	LS		\$	
0480	02569		DEMOBILIZATION	1.00	LS		\$	